IS001 / #26

BREASTFEEDING AND GROWTH

PARALLEL SESSION 01: BREASTFEEDING AND HEALTH OUTCOMES

Atul Singhal
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While breast-feeding is the best form of nutrition for the new-born, the underlying mechanisms for its benefits for both short-term and long-term health remain poorly understood. Over the last 20 years, there has been a particular focus in understanding whether differences in patterns of growth between breast- and formula-fed infants could explain some of the health advantages of breast-feeding. Many systematic reviews have shown that, compared to infants fed formula, those given breast-milk have slower patterns of weight gain in the first year of life, which itself is associated with a lower risk of obesity later in life[1]. These observations suggest that breast-fed infants have a more physiological, 'healthier' pattern of growth and have led to both the development of the WHO growth charts based on exclusively breast-fed infants and to reductions in the protein content of infant formula to prevent excessive weight gain. However, the nutritional factors in human milk which influence the rates of infant weight gain are unclear and whether differences in protein intake alone can explain slower patterns of weight gain in breast-fed infants is uncertain. For example in a recent study, where milk volume intake was determined using the gold standard deuterium "dose-to-mother" technique, total carbohydrate, but not total protein intake, was strongly associated with the rate of weight gain between birth and age 3 months, independent of total energy intake[2]. This presentation will consider the differences in growth patterns between breast- and formula-fed infants, the contributing factors involved, and the pros and cons of the WHO growth charts. It will also explore the implications of patterns of growth in infancy for clinical and public health practice. 1. Doñate Carramiñana L, Guillén Sebastián C, Iglesia Altaba I, Nagore Gonzalez C, Alvarez Sauras ML, García Enguita S, Rodriguez Martinez G. Rapid Growth between 0 and 2 Years Old in Healthy Infants Born at Term and Its Relationship with Later Obesity: A Systematic Review and Meta-Analysis of Evidence. Nutrients. 2024 Sep 2;16(17):2939. doi: 10.3390/nu16172939. PMID: 39275254; PMCID: PMC11397548. 2. Grant M, Lanigan J , Sutton E , Currie A , Godin JP , Thakkar SK , Singhal A. (2025), ESPGHAN 57th Annual Meeting Abstracts. JPGN Reports, 6: S1168. https://doi.org/10.1002/jpr3.70024

IS002 / #27

BREASTFEEDING AND OBESITY

PARALLEL SESSION 01: BREASTFEEDING AND HEALTH OUTCOMES

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Breast milk is the optimal nourishment for infants, to achieve optimal growth, health, and development. Exclusive breastfeeding (EBF) is defined by the World Health Organization (WHO) as providing an infant with only breast milk, excluding solids or any other fluids, and infants should be exclusively breastfed for the first six months of life. Over the past decades, numerous studies have shown that breastfeeding protects against childhood obesity (Padhani ZA,et al. Nutr Rev. 2023; Yan J,et al. BMC Public Health. 2014; Arenz S,et al. Int J Obes(Lond) 2004; Owen CG, et al. American Academy of Pediatrics 2005; Harder T, et al. Am J Epidemiol 2005), with benefits that extend into adulthood (Horta BL, et al. Acta Paediatr. 2023). Regarding the duration of breastfeeding, infants breastfed for ≥7 months were significantly less likely to have obesity later on during childhood (AOR = 0.79, 95% CI: 0.70, 0.88), compared to those breastfed for a shorter duration (Yan J, et al. BMC Public Health. 2014). Longer duration of exclusive and partial breastfeeding tended to be associated with slower growth rates in infancy (Patro-Gołąb B, et al. Breastfeed Med. 2019), and each additional month of breastfeeding resulted in a 4% reduction in the risk of childhood obesity in a dose–response relationship (Qiao J, et al. J Pediatr Nurs. 2020). With regard to the type of breastfeeding, the most recent meta-analysis by Qiao et al. showed that EBF reduced the risk of childhood obesity (at 2–6 years) by 47% compared with formula feeding, and by 15.0% compared with exclusive formula or mixed feeding (Qiao J,et al. J Pediatr Nurs. 2020). Infant feeding type is linked to distinct body composition patterns: formula-fed infants have lower fat mass in the first 6 months, although the trend toward higher fat mass in formula-fed infants during the second 6 months was not significant at 12 months (Gale C,et al. Am J Clin Nutr 2012). Evidence concerning the timing of breastfeeding along with the introduction of complementary feeding in relation to obesity risk remains highly fragmented, depending on meta-analysis methodologies and exposure categorizations. While early introduction of complementary feeding before 4 months has been consistently associated with an increased risk of obesity (Pearce J, et al. Int J Obes (Lond). 2013; Padhani ZA, et al. Nutr Rev. 2023), at present there is no robust evidence supporting differences in obesity risk between an EBF duration of 4–6 months versus 6 months (Padhani ZA, et al. Nutr Rev. 2023). This issue remains to be clarified in future meta-analyses Given that evidence is mostly from high-income countries (HICs), with limited data from low- and middle-income countries (LMICs) (Patro-Gołąb B, et al. Breastfeed Med. 2019), in 2022 Hildebrand et al. explored the protective effect of breastfeeding on childhood obesity across different racial populations (Hildebrand JS, et al. Child Obes. 2022). The authors found that six months of EBF, compared with no breastfeeding, was associated with 60% lower odds of obesity (95% CI 0.18–0.91) in 4–8-year-olds, and inversely correlated with body fat percentage across all children, independent of gender, race/ethnicity, and maternal BMI (Hildebrand JS, et al. Child Obes. 2022). Finally, according to WHO guidelines, continued breastfeeding into the second year of life does not appear to be protective against overweight and obesity compared with no breastfeeding, although a slightly lower BMI has been observed among children and adolescents breastfed the second year of life (WHO; 2023).

Overall, exclusive or full breastfeeding should be promoted for at least 4 months (17 weeks, beginning of the 5th month of life) and exclusive or predominant breastfeeding for approximately 6 months is considered a desirable goal.

IS003 / #30

FAMILY INTEGRATED CARE: FEASIBILITY AND EFFICACY FROM HEALTH CARE PROFESSIONAL PERSPECTIVE

PARALLEL SESSION 02: NOVEL WAYS TO IMPROVE PRETERM GROWTH

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Background: Family Integrated Care (FICare), including Family-Centered Rounds (FCR), aims to actively involve parents in neonatal care. We hypothesized that FCR as part of FICare would reduce hospital stay and improve neonatal outcomes in level II neonatal wards. Methods: This multicenter, stepped-wedge cluster-randomized trial was conducted in ten level II neonatal wards in the Netherlands (March 2022–December 2023). During the study, all participating wards transitioned from providing standard neonatal care (SNC) to FICare including FCR. Here we report the neonatal outcomes regarding length of hospital stay, growth, feeding regimen, respiratory support and sepsis treatment. Linear mixed-effects models were used, with hospital and family included as random intercepts, and intervention status and time as fixed effects to account for the stepped-wedge design. Findings: A total of 518 families with 599 infants hospitalized ≥7 days were included. Infants in FICare had a significantly shorter hospital stay compared to SNC (19 days [IQR 13–34] versus 21 days [IQR 13–30], adjusted mean ratio: 0·93 [0·87–0·99]; P = ·02). Exclusive breastfeeding at discharge was more common in FICare (37%) than in SNC (24%) (adjusted odds ratio: 1·86 [1·25–2·79]; P = ·00). Parenteral nutrition use was lower in FICare (31%) versus SNC (35%) (adjusted odds ratio: 0·64 [0·43–0·95]; P = ·03). No significant differences were found in weight gain, tube feeding, respiratory support, or sepsis treatment. A prehoc analysis among infants transferred from other hospitals showed similar benefits. Interpretation: Implementation of FICare, including FCR, in level II neonatal wards reduced length of hospital stay, increased exclusive breastfeeding at discharge, and reduced the need for parenteral nutrition.

IS004 / #31

FAMILY INTEGRATED CARE: FEASIBILITY AND EFFICACY FROM PARENTS PERSPECTIVE

PARALLEL SESSION 02: NOVEL WAYS TO IMPROVE PRETERM GROWTH

Silke Mader
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Family-integrated care models actively involve parents as partners in the care of premature or sick infants in neonatal units. Studies show that this is possible with support through training, emotional support, and collaborative partnerships between staff and parents. Parents report increased self-confidence, reduced stress, and a stronger bond with their infants. Breastfeeding support is a key component, enabling early initiation of breastfeeding, maintaining milk production, and transitioning to direct breastfeeding. Involving parents in their infant's care contributes to a better nutritional pathway and long-term development and empowers parents — Important factors for a smooth transition and follow-up care after discharge.

IS005 / #32

PERSONALIZED NUTRITION STRATEGIES

PARALLEL SESSION 02: NOVEL WAYS TO IMPROVE PRETERM GROWTH

Magnus Domellöf
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Being born very preterm (< 32 wk) or having very low birth weight (< 1500 g) constitutes a nutritional emergency, with high risk of general malnutrition and postnatal growth failure, even in modern neonatal intensive care units. Poor nutrition has been associated with severe metabolic disturbances, sepsis, necrotizing enterocolitis, osteopenia, BPD, severe ROP and not least poor neurodevelopment in preterm infants. Guidelines for enteral and parenteral nutrition of preterm are available from ESPGHAN and other organizations, but standardized nutrition protocols do not normally consider factors such as individual disease severity, enteral tolerance, parenteral access, growth, breast milk composition, biomarkers of nutrition or cumulated nutrient intake. There are different strategies for human milk fortification: Standard fortification, assuming average nutrient content of breast milk, or individualized fortification – the latter can be either adjustable fortification based on blood urea nitrogen levels or targeted fortification based on breast milk analyses. Several observational studies suggest that a combination of targeted fortification and computer assisted prescription of parenteral and enteral nutrition results in improved growth. A randomized, controlled trial is ongoing to elicudate whether targeted fortification, as compared to standard fortification, will improve cognitive development at 18-24 months in VLBW infants. Monitoring of growth and nutritional status is essential during the NICU stay. Intrauterine growth is often considered the gold standard for extrauterine growth in preterm infants, but studies suggest that alternative growth targets may be more beneficial. There is a lack of consensus on which growth chart to use, and new growth charts have recently been published. A number of biomarkers of nutrition have been suggested to screen for iron deficiency, ostepenia and other nutritional disturbances. In addition, a number of food supplements have been suggested to improve health outcomes in specific risk groups. Human milk based fortifiers, probiotics and fatty acid supplements have all been evaluated in recent studies and some of these have been shown to improve health outcomes. In conclusion, personalized nutrition strategies, monitoring of growth and biomarkes, and selected food supplements are all promising strategies for the improvement of growth and health outcomes in preterm infants.

IS006 / #34

AVOIDANT RESTRICTIVE FOOD INTAKE DISORDER (ARFID) IN CHILDREN AND ADOLESCENTS: CURRENT INSIGHTS

PARALLEL SESSION 03: PEDIATRIC FEEDING DISORDER AND AVOIDANT RESTRICTIVE FOOD INTAKE DISORDER. OVERLAPPING BUT DIVERGING DIAGNOSES

Lisa Dinkler
Karolinska Institutet, Department Of Medical Epidemiology And Biostatistics, Stockholm, Sweden

This talk will provide an overview of current epidemiological research on ARFID in children and adolescents, including prevalence across different populations, the distribution of diagnostic criteria and ARFID presentations (drivers of food avoidance), co-occurring conditions, and illness course.

IS007 / #35

PEDIATRIC FEEDING DISORDERS: TRENDS, TRIGGERS, AND FUTURE DIRECTIONS.

PARALLEL SESSION 03: PEDIATRIC FEEDING DISORDER AND AVOIDANT RESTRICTIVE FOOD INTAKE DISORDER. OVERLAPPING BUT DIVERGING DIAGNOSES

Anna Chmielewska
Umeå University, Department For Clinical Sciences, Pediatrics, Umeå, Sweden

Pediatric feeding disorder (PFD) is defined as impaired oral intake inappropriate for age, associated with dysfunction in at least 1 of 4 domains: medical, nutritional, feeding skill, psychosocial. The condition is multifactorial and often needs multiprofessional management. The overall prevalence is about 3% in children under 5 years and up to 80% in those with complex comorbidities. My talk will encompass epidemiology including the recently reported rising prevalence of PFD, its causes and consequences, as well as brief summary of the existing treatment options and future directions.

IS008 / #36

THE MANAGEMENT OF PEDIATRIC AVOIDANT/RESTRICTIVE FOOD INTAKE DISORDER (ARFID)

PARALLEL SESSION 03: PEDIATRIC FEEDING DISORDER AND AVOIDANT RESTRICTIVE FOOD INTAKE DISORDER. OVERLAPPING BUT DIVERGING DIAGNOSES

Elin Hård Af Segerstad
Skane University Hospital, Pediatric Department, Malmoe, Sweden

ARFID is a condition that affects nutritional status, quality of life, mental health, and social relations. The clinical management need to be holistic and target the negative impact in all of these areas. This lecture will present the current evidence for different clinical approaches to manage ARFID, within a holistic framework.

IS009 / #39

FORMULA VS. BREAST MILK: ARE MICROBIAL DIFFERENCES SMALLER THAN WE THOUGHT?

PARALLEL SESSION 04: GUT MICROBIOTA & MODIFICATIONS

Maria Carmen Collado
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Early-life nutrition plays a crucial role in the development of the gut microbiota, immune system maturation, and long-term health. Breastfeeding is widely regarded as the gold standard for establishing a healthy infant gut microbiota due to its complex and dynamic composition, which includes macro and micro-nutrients and also, a wide range of bioactive compounds including human milk oligosaccharides, microbes and metabolites among others. By contrast, infant formula has traditionally been associated with a different microbial profile, typically characterised by lower diversity and reduced abundance of beneficial bacteria such as Bifidobacterium. However, recent advances in formula composition and microbiome research call into question the extent and clinical relevance of these differences and whether they actually persist.. This lecture will review the current evidence regarding the development of gut microbiota in both breastfed and formula-fed infants, and also, mixed-feeding that remains poorly defined and insufficiently studied in microbiota research. Specifically, it will examine whether modern formula innovations are having an impact on microbial composition differences. Emerging data suggest that adding biotics (prebiotics, probiotics, synbiotics and postbiotics) to formula can affect the composition of an infant's gut microbiota and their metabolic activity. However, other factors such as mode of delivery, antibiotic exposure, prematurity and complementary feeding practices also exert a strong influence. It is essential to understand when these differences have a clinical impact in order to develop realistic evidence-based nutritional strategies that support healthy growth and development in early life.

IS010 / #40

THE INTERNATIONAL SCIENTIFIC ASSOCIATION FOR PROBIOTICS AND PREBIOTICS CONSENSUS STATEMENT ON THE DEFINITION AND SCOPE OF THE TERM GUT HEALTH

PARALLEL SESSION 04: GUT MICROBIOTA & MODIFICATIONS

Marlies Meisel
University of Pittsburgh, Immunology, Pittsburgh, United States of America

The term *gut health* is increasingly used as a catch-all phrase by many stakeholders, including scientists, healthcare professionals, industry, and consumers to describe a wide range of health-related concepts. Despite its widespread use, particularly in relation to studies on diet, fermented foods, biotics (encompassing probiotics, prebiotics, synbiotics, postbiotics), and the gut microbiome, it remains unclear what the term gut health means. Therefore, an expert panel was convened in September 2024 by the International Scientific Association for Probiotics and Prebiotics (ISAPP) to address the current state of scientific and clinical knowledge on the physiology, manifestation, application and measurement of the concept of gut health. The panel evaluated the term in the context of the central role of the gastrointestinal tract in health and overall well-being and proposed a definition of gut health as ***a state of normal gastrointestinal function without active gastrointestinal disease and gut-related symptoms that affect quality of life.*** The definition was developed mindful of the functional, subjective, and extrinsic domains that contribute to gut health. Clinically relevant and accessible metrics to assess these domains are reviewed and a comprehensive approach to gut health is proposed that is relevant to clinical practice as well as to studies of dietary and biotic interventions.

IS011 / #41

METHODOLOGICAL CHALLENGES AND PROPOSED SOLUTIONS IN STUDYING BIOTIC-SUPPLEMENTED INFANT FORMULA

PARALLEL SESSION 04: GUT MICROBIOTA & MODIFICATIONS

Hania Szajewska
The Medical University of Warsaw, Department Of Paediatrics, Warsaw, Poland

Infant formula modification aims to reduce differences in health and developmental outcomes between formula-fed and breastfed infants. Formulas supplemented with biotics, including probiotics, prebiotics, synbiotics, postbiotics, and human-identical milk oligosaccharides, have been widely studied, yet evidence for clinically meaningful benefits remains limited and inconsistent despite numerous randomized controlled trials. This presentation will summarise key findings from recent evaluations of RCTs on biotic-supplemented infant formulas, showing no major safety concerns in healthy infants but little consistent evidence of efficacy beyond limited effects for specific prebiotics. Major methodological limitations will be highlighted, including heterogeneity in study design, populations, interventions, outcomes, and follow-up, as well as shortcomings in transparency and reporting. The presentation will conclude by outlining core methodological principles needed to improve future trials, with emphasis on rigorous design, clinically relevant outcomes, adequate power, ethical safeguards, and transparent governance, to generate more reliable and interpretable evidence.

IS012 / #43

EN- WHAT ARE THE INDICATIONS?

PARALLEL SESSION 05: ENTERAL NUTRITION

Jiri Bronsky
University Hospital Motol, Dept. Of Paediatrics, Prague, Czech Republic

Background and Rationale
Enteral nutrition represents a cornerstone of nutritional management in pediatric populations across diverse clinical settings. Despite widespread clinical application, significant heterogeneity exists in practice patterns, timing of initiation, and delivery methods. Recent systematic reviews and clinical practice guidelines have synthesized emerging evidence to inform optimal approaches to enteral nutrition support in children.
Objectives
This presentation synthesizes current evidence regarding indications for enteral nutrition in pediatric patients, examining clinical scenarios where enteral support is beneficial, timing and methods of delivery, and associated clinical outcomes across multiple pediatric populations including critically ill children, those with chronic inflammatory conditions, and patients requiring post-discharge nutritional support.
Key Findings and Clinical Implications
Evidence on early initiation of enteral nutrition in critically ill children and associations with clinical outcomes will be reviewed with respect to the fact that certainty of evidence remains limited by study heterogeneity and methodological challenges.
In chronic inflammatory conditions, particularly pediatric Crohn's disease, exclusive enteral nutrition has emerged as a safe and effective first-line therapy for inducing remission, offering a non-pharmacological alternative with favorable safety profiles. Its ositioning in the treatment algorythm will be discussed with respect to current guidelines and modern trends in therapeutic approach in paediatric IBD.
Post-discharge enteral nutrition demonstrates benefits in promoting growth and nutritional recovery, particularly when delivered through structured, multidisciplinary programs incorporating parental education and systematic follow-up. Evidence suggests that multifaceted interventions combining nutritional support with comprehensive care coordination yield superior outcomes.
Conclusions
The indications for enteral nutrition in pediatric patients continue to expand as evidence accumulates regarding benefits across diverse clinical scenarios. While current guidelines provide frameworks for practice, important questions remain regarding optimal timing, formulation selection, and duration of therapy. This presentation will synthesize current knowledge and identify critical research priorities to advance evidence-based nutritional care for children.

IS013 / #44

MODE OF DELIVERY: TUBE VS GASTROSTOMY OR JEJUNAL FEEDING?

PARALLEL SESSION 05: ENTERAL NUTRITION

Lorenzo Norsa
Vittore Buzzi children's Hospital, Pediatric Department, Milano, Italy

Enteral nutrition is the preferred strategy for children who cannot meet their nutritional needs orally but retain functional gastrointestinal capacity. ESPGHAN guidance highlights that the choice of feeding route should be individualized, guided by expected duration of support, underlying diagnosis, feeding tolerance, and potential risks. For short-term nutritional support, nasogastric or nasojejunal tubes are generally recommended because they are simple to place, reversible, and avoid surgical procedures. Nevertheless, prolonged use may be associated with discomfort, tube dislodgement, nasal and esophageal irritation, and concerns regarding body image and social participation. When long-term enteral nutrition is anticipated, gastrostomy is considered the preferred option. In children with neurologic impairment, chronic dysphagia, or growth faltering requiring sustained support, gastrostomy feeding has been associated with improved nutritional status, reduced caregiver burden, and better quality of life once established. Careful timing and thorough pre-procedure evaluation are essential to minimize complications such as infection, leakage, or granulation tissue. Jejunal feeding is reserved for specific situations, including severe gastroesophageal reflux with aspiration risk, gastric outlet or motility disorders, and persistent intolerance to gastric feeds. Placement via gastrojejunostomy or jejunostomy can be effective but requires specialized management and carries higher risks of tube blockage and displacement. ESPGHAN emphasizes multidisciplinary assessment and shared decision-making with families, clear therapeutic goals, structured education on tube care, and regular follow-up to reassess the indication. Ultimately, the optimal mode of delivery in children balances safety, tolerance, developmental needs, and long-term outcomes, aiming to support growth while preserving comfort and family-centered care.

IS014 / #45

HOW TO CHOOSE PROPER ENTERAL FORMULA

PARALLEL SESSION 05: ENTERAL NUTRITION

Koen Huysentruyt
UZ Brussel, Vrije Universiteit Brussel (VUB), Department Of Paediatric Gastro-enterology, Hepatology And Nutrition, Jette, Belgium

In this lecture, the general principles of nutritional interventions, including indications and contra-indications for enteral nutrition in children will be discussed. The lecture will handle on the different modalities of enteral nutrition and provide insight on the nutritient composition of enteral formula in pediatrics. Given the increasing use of blended diet in children, the evidence around this topic will be reviewed and references to practical guidance for the practical implication of blended diet in children will be discussed.

IS015 / #46

BLENDERIZED DIETS OR ENTERAL FORMULA OR BOTH?

PARALLEL SESSION 05: ENTERAL NUTRITION

Jutta Koeglmeier
Great Ormond Street Hospital for Children NHS Foundation Trust, Unit Of Nutrition And Intestinal Failure Rehabilitation - Department Of Paediatric Gastroenterology, London, United Kingdom

The use of sterile, nutritionally complete commercially available feeds is considered the gold standard of feeding patients requiring artificial enteral nutrition. However, blended diets given as an alternative mode of feeding have enjoyed increasing popularity in recent year. Blended diet (BD) is a term used to describe the process of giving liquidised or blended food into the enteral feeding device of patients requiring tube feeding. It is different from an orally offered diet of pureed foods. BD can be used to provide all or part of the nutrition. BD in combination with standard formulas allows flexibility. Parents of school aged children may choose to offer BD at home, but for practical reasons standard formula continues to be given at school. Commercial enteral formula can be given via a variety of different feeding devices including gastric and jejunal tubes, either nasally inserted or via the abdominal wall. Blended foods are often thicker than traditional formulas and nasogastric feeding tubes may be too narrow. Blended foods are not sterile and jejunal feeding, where the acidic and protective gastric environment are bypassed, may hence potentially be unsafe. At present, gastrostomy tubes are therefore the recommended route of choice. A better understanding of the bacterial load of blended foods is needed to inform about feed hanging times in pump fed children and those who require post-pyloric feeding. Low profile balloon/button gastrostomies can be easily changed by carers at home and are hence ideal for use with BD. Blended foods are well tolerated through a 14 Fr or wider tube with reduced risk of tube blockage. An emergency plan should be agreed in case the tube does get blocked when BD is started. An individual risk assessment should be carried out in all patients prior to the start of BD, and enough information provided for the patients or carer to make an informed choice regarding BD. Parents who use this method of feeding for their child have reported benefits including reduced gastroesophageal reflux disease (GERD) and diarrhoea, improvement of constipation, level of alertness and attention span, skin conditions, appearance of hair and nails, overall wellbeing and reduced number of infections. Children receiving a BD benefit from dietetic follow up to make sure that appropriate amount of nutrition is given. Particularly when blended foods are first introduced, or during transition from standard formula to BD regular dietetic reviews are important to guarantee that the family is adequately supported, particularly when facing difficulties. Parents have said to experience a greater sense of normality and de-medicalisation of their child's feeding with BD. However, robust research informing about the benefits and risk of BD is lacking. Large multi-centre trials are needed to compare the benefits and risks of a blended diet to commercially available tube feeds. These should include patients and public involvement in keeping with modern research standards.

IS016 / #200

PFAS LEVELS IN BREASTMILK AND FORMULA AND THEIR INFLUENCE ON BONE MINERAL DENSITY, BODY COMPOSITION AND GROWTH

PARALLEL SESSION 06: PEDIATRIC GROWTH AND METABOLISM: FROM BONE HEALTH TO NEURODEVELOPMENT

Anita C.S. Hokken-Koelega
Erasmus University Medical Center - Sophia Children's hospital, Department Of Paediatrics, Rotterdam, Netherlands

Background and methods Poly- and Perfluoroalkyl substances (PFAS) are a group of >8,000 man-made chemicals, produced since the 1950s. Because of their water-, dirt- and grease-repellent quality, they are used in food-packing materials and non-stick coating in pans and other common products. PFAS migrate easily into the environment as they spread through water and air. Most PFAS are non-degradable and accumulate in animals and humans and are therefore called ''forever chemicals''. They cause alterations in metabolic and endocrine systems. In adults, adverse effects, such as lipid and insulin dysregulation, more cancer and altered thyroid function have been reported. Rodent studies show that PFAS exposure during early life is associated with a wide range of adverse developmental effects. We found that exclusively breastfed infants have 3-times higher plasma PFAS levels compared to exclusively formula-fed infants during the '*first 1000 days*", which could potentially reduce the health benefits of breastfeeding. In healthy term-born infants, participating in the Sophia Pluto Birth Cohort, we determined plasma PFAS levels, growth, body composition (fat mass and lean body mass) and bone mineral density (BMD) by Dual-energy-X-ray-Absorptiometry (DXA). Five legacy plasma PFAS (Perfluorooctane-sulfonic-acid (PFOS), Perfluorooctanoic-acid (PFOA), Perfluorohexane sulfonic-acid (PFHxS), Perfluorononanoic-acid (PFNA) and Perfluorodecanoic-acid (PFDA)) were determined by liquid chromatography electrospray ionization tandem mass-spectrometry (LC-ESI-MS/MS) in samples collected at age 3 months, 2 and 5 years. We investigated longitudinal PFAS levels from age 3 months to 5 years and if PFAS levels were associated with growth, body composition and bone mineral density in the first 3 years of life. In addition, we examined if PFAS exposure through human milk diminishes the known health benefits of breastfeeding. **Results** PFAS decreased only slightly between age 3 months and 2 years and increased subsequently until age 5 years, except of PFOA which slightly decreased from age 3 months to 5 years. PFAS levels at age 5 years were approximately 1.5 times higher when children received exclusive breastfeeding in the first 3 months of life compared to those fed exclusive formula feeding. PFAS levels at age 3 months and 2 years (corrected for feeding type) were inversely associated with linear growth from birth to 3 years, and with height SDS, lean body mass (LBM) SDS and BMD SDS at age 3 years. In contrast, exclusive breastfeeding in the first 3 months (corrected for PFAS) was positively associated with the same outcomes at age 3 years. **Conclusions** Plasma PFAS levels decrease only slightly from age 3 months to 5 years. Plasma PFAS levels in early life are inversely associated with linear growth, lean body mass SDS and bone mineral density SDS during the first 3 years of life, in contrast to the positive associations of exclusive breastfeeding with these outcomes. This suggests that PFAS may jeopardize breastfeeding's health benefits, which warrants further research.

IS017 / #201

FACTORS ASSOCIATED WITH OBESITY IN PRESCHOOL CHILDREN

PARALLEL SESSION 06: PEDIATRIC GROWTH AND METABOLISM: FROM BONE HEALTH TO NEURODEVELOPMENT

Luis A Moreno
Universidad de Zaragoza, Genud Research Group, Zaragoza, Spain

Obesity in preschool children is a critical public health concern, with prevalence increasing globally across diverse socioeconomic contexts. Early childhood represents a sensitive developmental window in which excess adiposity can establish trajectories of adverse health outcomes towards adolescence and adulthood. Understanding the multifactorial determinants of obesity in this age group, as well as its early cardiometabolic consequences, is essential for designing effective prevention and treatment strategies. A broad set of factors contributes to obesity risk in preschool-aged children. Genetic and biological determinants play a major role; heritability estimates for body mass index (BMI) in early childhood are high, and polymorphisms related to appetite regulation, energy expenditure, and adipogenesis influence susceptibility. Genetic predisposition also interacts with modifiable environmental exposures. Dietary patterns in early childhood, including high intake of energy-dense, nutrient-poor foods; excessive consumption of sugar-sweetened beverages; large portion sizes; and inadequate fruit and vegetable intake, are consistently associated with greater adiposity. Feeding practices such as coercive feeding, lack of structured meal routines, and early introduction of energy-dense foods further increase the risk. Physical activity and sedentary behaviours are major behavioural determinants. Preschoolers with limited opportunities for active play, low participation in moderate-to-vigorous physical activity, or limited access to safe outdoor environments have a higher risk of developing obesity. Elevated time devoted to sedentary behaviours, especially screen time, also contributes to positive energy balance. Sleep duration and quality are also significant risk factors; insufficient sleep is associated with hormonal dysregulation (e.g., leptin and ghrelin imbalance), increased appetite, altered glucose metabolism, and behavioural changes that promote overeating and inactivity. Some socioeconomic and environmental contexts, including parental education, household food insecurity, neighbourhood characteristics, and cultural norms, also determine children's behaviours. Maternal obesity, gestational diabetes, and early-life growth patterns (particularly rapid weight gain during infancy) are strong predictors of preschool obesity, highlighting the importance of life-course influences. The consequences of early childhood obesity extend beyond high adiposity levels. Cardiometabolic abnormalities are already present in preschool-aged children. These include unfavourable lipid profiles (elevated serum triglycerides, reduced serum HDL cholesterol concentrations), increased blood pressure, insulin resistance, and early markers of systemic inflammation. These early cardiometabolic complications often persist and worsen over time, substantially increasing the risk of type 2 diabetes and cardiovascular disease later in life. The psychosocial consequences of obesity may also appear during preschool years. They include reduced motor competence, lower self-esteem, and early stigmatisation. Effective prevention requires a multi-component approach addressing biological vulnerability, family behaviours, childcare, school environments, and social determinants of health. Recognising both the complexity

of contributing factors and the potential for early cardiometabolic complications justifies early targeted interventions to promote healthy growth and prevent obesity development.

IS018 / #202

HOW CHILDREN GROW: INSIGHTS FROM GROWTH PLATE BIOLOGY

PARALLEL SESSION 06: PEDIATRIC GROWTH AND METABOLISM: FROM BONE HEALTH TO NEURODEVELOPMENT

Jeffrey Baron
National Institutes of Health, National Institute Of Child Health And Human Development, Bethesda, United States of America

Children grow taller because their bones grow longer. Bone elongation occurs at the growth plate, a thin layer of cartilage found near the ends of juvenile bones. In the growth plates, new cartilage is produced through chondrocyte proliferation, hypertrophy, and cartilage matrix synthesis, a process termed chondrogenesis. The newly formed cartilage is then remodeled into bone. Growth plate chondrogenesis is under extensive, multi-level regulation involving endocrine, paracrine, extracellular matrix-related, and intracellular pathways. With age, growth plate chondrogenesis slows and eventually stops in adolescence. This slowing and cessation of growth results from a developmental program termed growth plate senescence in which the growth capacity of the growth plate is gradually exhausted. Undernutrition slows growth plate chondrogenesis and therefore slows linear growth through a variety of mechanisms. Undernutrition also slows growth plate senescence, thus retaining the growth capacity of the growth plate. If the child's nutritional state improves, the delayed growth plate senescence results in linear catch-up growth.

IS019 / #54

KEYNOTE SPEAKER: USE OF GLP1 AGONIST IN ADOLESCENTS

OPENING CEREMONY AND KEYNOTE LECTURE

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Obesity in children and adolescents is defined as abnormal or excessive body fat accumulation that presents a risk to health. In 2020, globally, ~430 million children and adolescents aged 5–19 years were estimated to have obesity, a figure which is projected to increase to 770 million by 2035. Excessive body fat accumulation during childhood is associated with the development of serious chronic diseases, such as type 2 diabetes, dyslipidemia, hypertension, metabolic dysfunction-associated steatotic liver disease (MASLD), obstructive sleep apnea, cardiovascular disease, and premature death. Early childhood is a critical time in the development of obesity which once manifested tracks into adolescence and adulthood. Therefore, childhood is a critical window for the treatment and management of obesity. Between 2003 and 2022, five obesity pharmacotherapies were approved by the U.S. Food and Drug Administration for adolescents: liraglutide, semaglutide, orlistat, and phentermine/topiramate extended- release capsules (for those aged ≥12 years), two of which (liraglutide and semaglutide), glucagon-like peptide-1 receptor agonists (GLP-1RA) are also approved by the European Medicines Agency (for those aged ≥12 years). Glucagon-like peptide-1 receptor agonists (GLP-1RAs) have emerged as a pivotal treatment option for both obesity and type 2 diabetes, demonstrating efficacy in weight reduction and blood glucose management. The therapeutic use of GLP-1RAs has evolved significantly, offering various formulations that provide different efficacy, routes of administration, and flexibility in dosing. This lecture will discuss the currently approved anti-obesity medications in the management of adolescent obesity focusing on GLP-1RAs. It will examine data from various clinical trials demonstrating efficacy and safety that led to their regulatory approval but also explore adverse events. Furthermore, improvements in insulin sensitivity and the risk factors for type 2 diabetes, fatty liver disease and cardiometabolic risk factors will be discussed. Lastly, it will highlight the advent of novel agents which are dual and triple hormonal agonists which represent the future direction of incretin-based therapy.

IS020 / #55

FORTIFICATION OF OWN MOTHERS MILK AND/OR PASTEURIZED DONOR MILK: WHEN TO START, WHEN TO STOP AND WITH WHAT GOAL

PARALLEL SESSION 07: ENTERAL NUTRITION FOR PRETERMS

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Introduction: Human milk is the optimal enteral nutrition for preterm infants; however, its native nutrient content is insufficient to meet the high requirements of very preterm and very low birth weight infants. Over the past two decades, studies have shown that fortification can improve growth outcomes and may reduce certain neonatal morbidities. **Objective:** To summarize current evidence, products, practices, and challenges related to human milk fortification for preterm infants. Highlighting clinical outcomes, nutrient adequacy, and practical considerations in neonatal care. Historical and contemporary data demonstrate improved head circumference growth among extremely preterm infants following implementation of routine human milk fortification. Randomized trials evaluating protein-enriched and individualized fortification strategies report variable effects on neurodevelopmental outcomes, motor function, and growth, with some studies indicating potential benefits. Recent ESPGHAN recommendations endorse multi-component fortifiers, initiated at 40–100 mL/kg/day, and acknowledge the role of adjustable and targeted fortification approaches. Multiple fortifier types exist, including bovine-based, human milk-based, and novel alternatives such as donkey milk and bovine colostrum, yet evidence on macronutrient and especially micronutrient composition remains limited. Studies comparing newer formulations report good tolerance but generally no significant differences in growth or morbidity. Evaluation of fortification effects must include short-term growth, micronutrient status, bone health, feeding tolerance, and long-term neurodevelopmental outcome. Practical aspects such as osmolality, preparation methods, hygiene, and staff versus parent involvement in fortification remain areas of uncertainty and for debate. While fortification of human milk is essential for meeting the nutritional needs of preterm infants, no single fortifier or strategy currently emerges as ideal. **Conclusion:** Existing evidence supports individualized approaches combined with careful monitoring of growth, nutrient intake, and feeding tolerance. Continued research on optimal formulations, micronutrient adequacy, and long-term outcomes is warranted.

IS021 / #56

NEW PASTEURIZATION METHODS: ARE THEY SAFE, BETTER AND CHEAPER?

PARALLEL SESSION 07: ENTERAL NUTRITION FOR PRETERMS

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Donor human milk (DHM) is the recommended alternative when mother's own milk is unavailable for preterm and medically vulnerable neonates. The human milk bank (HMB) procedure is a multi-stage process involving milk collection, quality control and testing, pasteurization, and distribution to the infant according to clinical need. The real operational cost of producing 1 liter of pasteurized donor human milk in Europe typically ranges from approximately €200 to €310, depending on the country, healthcare infrastructure, and scale of milk bank model. Human milk banks in different countries incur substantial operational costs, which are driven primarily by staffing, transportation, and logistics rather than by the costs of milk processing itself. The standard for pasteurization in HMBs is Holder pasteurization (HoP), involving low temperature and long time (62.5°C for 30 minutes). Holder pasteurization is a globally accepted and technically straightforward method for processing donor human milk that relies on controlled low-temperature, long-time heating and does not require highly specialized or expensive equipment. While effective in inactivating pathogens, HoP may impair several immunological and bioactive components. Recently, alternative methods such as High-Temperature Short-Time (HTST) pasteurization, High-Pressure Processing (HPP), Ultraviolet-C irradiation (UV-C), and modified HoP protocols have been introduced to improve the safety-quality balance in donor milk processing. Especially HTST and HPP demonstrate superior preservation of heat-sensitive components such as bile salt-stimulated lipase, lactoferrin, and immunoglobulins. In the recent cost-minimization study from Spain, HTST demonstrated comparable or lower operational costs than HoP when deployed in an established HMB (approxmately € 6,594.00 for HTST pasteurization versus € 5,912.00 for HoP for 10 L), apparently due to lower staff time and increased automation. HTST offer higher nutritional and biological quality of donor milk while maintaining comparable levels of microbiological safety. New pasteurization methods, particularly HPP offer notable clinical advantages by ensuring microbiological safety while better preserving the nutritional and immunological properties of DHM. These benefits may help mitigate the higher processing costs by reducing the incidence of hospital-acquired infections, feeding intolerance, and necrotizing enterocolitis (NEC) and donor milk losses caused by contamination with *Bacillus cereus* bacteria. However, from an economic perspective, HPP entails substantially higher operational costs—approximately seven times greater than those of HoP—primarily due to the significant capital investment required for specialized equipment. This cost differential suggests that economic evaluations of HPP must incorporate clinical outcomes and long-term cost savings to determine its value for implementation in human milk banking. Overall, integrating innovative pasteurization strategies may increase cost-effectiveness and clinical outcomes in neonatal nutrition. Future cost-effectiveness analyses and implementation studies are needed to confirm long-term economic and clinical benefits of new method of processing of donor milk.

IS022 / #57

LONG TERM EFFECTS OF COMPLEMENTARY FEEDING STRATEGIES FOR PRETERMS: WHEN AND HOW TO START

PARALLEL SESSION 07: ENTERAL NUTRITION FOR PRETERMS

The timing of complementary feeding introduction in preterm infants is a crucial factor influencing long-term health outcomes. Preterm infants face unique challenges related to growth and development, and their feeding strategies must be adapted to their specific nutritional needs. The methods and timing of complementary feeding in preterm infants vary widely, both between and within different countries. Research highlights the significance of early nutritional intervention to prevent postnatal growth restriction and support neurodevelopment. For preterm infants, the introduction of solid foods should align closely with developmental milestones, particularly the infant's ability to handle textures and self-feed. However, the optimal timing for introducing complementary feeding remains a topic of debate, with studies suggesting that both early and late introduction may have distinct advantages and challenges. Growing concerns about the long-term effects of complementary feeding timing include its potential impact on risks for overweight and obesity, atopic diseases, eating behavior, food preferences, nutrient status, and neurodevelopmental outcomes. Current guidelines recommend introducing complementary foods between 5 to 8 months postnatal age or from 3 months corrected age, ensuring that developmental progress is taken into account.

IS023 / #49

OBESITY TREATMENT AND LINEAR GROWTH

PARALLEL SESSION 08: NUTRITIONAL INTERVENTION FOR OPTIMIZING GROWTH POTENTIAL

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Aims: Long-acting glucagon-like peptide-1 receptor agonists (GLP-1RAs) have emerged as highly effective pharmacologic agents for obesity management. GLP-1RAs are currently approved for the treatment of obesity in children older than 12 years and for type 2 diabetes mellitus in children older than 10 years. However, their effects on linear growth in children remain poorly characterized. Our aim was to assess whether there is a direct effect of GLP1-RAs on the epiphyseal growth plate in ATDC5 cells, a well-established in-vitro chondrogenic model. **Methods**: We analyzed the expression of GLP-1R in ATDC5 cells using reverse transcription -PCR and immunofluorescence analyses. Exendin-4, a GLP-1RA, was used to evaluate the receptor`s activity and the impact of GLP-1R activation on cell proliferation. **Results**: GLP-1R mRNA was detected in naïve ATDC5 cells and throughout chondrocyte differentiation. Exposure to Exendin-4 for 5 to 30 minutes resulted in a significant elevation of intracellular cAMP levels. In insulin, transferrin, and Selenium (ITS)-induced ATDC5 cells, treatment with Exendin-4 led to a marked decrease in cell proliferation, as demonstrated by direct cell counting, the colorimetric CCK-8 assay, a significant downregulation of Ki67 mRNA expression, and a reduction in the percentage of Ki67-positive cells. **Conclusions**: We demonstrate for the first time that GLP1-Rs are present and active in ATDC5 chondrocytes, and their activation by Exendin-4 reduces chondrocyte proliferation rate, suggesting a direct effect of GLP1-RAs on the murine growth plate. These results warrant further investigation of potential effects of GLP1-RAs on linear growth.

IS024 / #50

OPTIMIZING NUTRITION DURING PUBERTAL SPURT

PARALLEL SESSION 08: NUTRITIONAL INTERVENTION FOR OPTIMIZING GROWTH POTENTIAL

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The pubertal growth spurt represents a unique and time-limited period of rapid linear growth driven by complex interactions between nutrition, endocrine regulation, and genetic potential. This presentation focuses on the role of nutrition in supporting optimal peak height velocity and efficient skeletal and lean tissue accretion during this critical phase of development. Key aspects to be discussed include the increased energy and protein requirements during the growth spurt, the importance of high-quality dietary protein for linear growth, and the role of essential micronutrients such as calcium and vitamin D, iron, zinc, and iodine. The presentation will examine how inadequate nutrient intake during the growth spurt may compromise growth velocity and final height, while excess energy intake and poor diet quality can disrupt normal growth patterns through increased adiposity and altered growth hormone–insulin-like growth factor 1 (GH–IGF-1) axis activity. The influence of growth spurt timing, sex-specific differences, and the interaction between nutrition and physical activity will also be addressed. By integrating current evidence and clinical experience, this presentation aims to provide a practical framework for optimising nutrition during the pubertal growth spurt to support healthy linear growth and favourable long-term outcomes.

IS025 / #59

HUMAN MILK OLIGOSACCHARIDES: STRUCTURE AND BIOLOGICAL FUNCTIONS IN PRETERM AND TERM INFANTS

PARALLEL SESSION 09: HUMAN MILK OLIGOSACCHARIDES: AN UPDATE

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Early life constitutes a critical developmental period during which body functions are constructed rather than merely maintained. The impact of environmental and biological exposures depends not only on their magnitude, but critically on their timing. During early development, when biological systems are incompletely formed, highly plastic, and weakly buffered, perturbations may become biologically imprinted, increasing later susceptibility to disease. Pre- and perinatally, maternal physiology, nutrition and gut microbiome are important, while from birth, infants encounter additional environmental and nutritional stimuli that shape their development. These range from social and emotional interactions to nutrition and the developing gut microbiome as a key emerging element. Nutrition and the gut microbiome work in concert with the infant's developing digestive system, absorptive capacity, metabolic processes, and immune functionality. The early extrauterine life is a critical 'learning' window for the gut and immune system to effectively safeguard the newborn against invasive pathogens while simultaneously fostering tolerance towards beneficial microbes and nutrients and diets necessary for appropriate healthy growth and development. Emerging evidence highlights the vital role of an appropriately paced gut microbiome's compositional and functional development in promoting gut health and in training the nascent immune system, which orchestrates this reciprocal and mutualistic relationship. Driving or disrupting this intricate relationship through a premature acquisition of certain microbes predisposes an infant to health or disease. Mechanistically, this is largely mediated by the gut and immune system responses. In human milk - the appropriate and recommended nutrition for infants- a high number of diverse non-digestible oligosaccharides, called HMOs, serve in part to drive the gut microbiome development during this early critical development phase. Today, a selection of manufactured HMOs from the main structural groups found in human milk are available for infant nutrition if a child cannot be fed human milk. Based on observational association data with human milk fed infants and mechanistic preclinical models, it appears that these HMOs evolved to benefit infant health. Preterm born infants do have a particularly perturbed gut and microbiome development. We evaluated an HMO blend as an early supplement in preterm born infants. Although they also received human milk, time to full enteral feeding was reached 2 days earlier with the HMO supplement compared to placebo control, although this did not reach statistical significance. Additionally, during hospital stay higher length-for-age z-scores were observed in the HMO supplemented group versus the control. Mechanistically, we can only speculate about pathways that may involve the gut and its developing microbiome. In term born infants, whose mothers chose not to breastfeed, randomized intervention trials with selected HMO blends with and without the addition of an HMO metabolizing probiotic *B. infantis* (strain LMG11588) provide valuable insights into their role in driving gut microbiome development and how that affects both gut health and systemic immune development. Among the identified features are pacing of the gut microbiome with lower early acquisition of late colonizing bacteria and their functions, their

association to gut barrier and inflammation related biomarkers, as well as systemic immune profile balance. Comparison to observations with long-term infant cohorts, partly backed by preclinical mechanistic studies, allows us to speculate about many of the identified features as factors predisposing infants to a healthy development trajectory or not.

IS026 / #60

SAFETY ASSESSMENT OF HUMAN-IDENTICAL MILK OLIGOSACCHARIDES PRODUCED THROUGH CHEMICAL SYNTHESIS OR MICROBIAL TECHNOLOGY

PARALLEL SESSION 09: HUMAN MILK OLIGOSACCHARIDES: AN UPDATE

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Oligosaccharides structurally identical to those naturally present in human milk (named as HiMO) are currently synthesized through microbial fermentation or chemical processes. HiMO according to the European legislation are considered as 'novel foods' (NF). A NF is defined as food that had not been consumed to a significant degree by humans in the EU before 15 May 1997, when the first Regulation on NF came into force. Since 2018 the European Food Safety Authority (EFSA) upon request of the European Commission (EC) is in charge of the risk assessment of the NFs (Reg.(EU)2015/2283). Risk management decisions are then taken by the EC, Member States and European Parliament. One of the underlying principles underpinning NF in the European Union is that it should be safe for consumers and not nutritionally disadvantageous under the proposed conditions of use. The assessment performed by EFSA concerns only the risks that might be associated with consumption of the NF and it is not an assessment of the efficacy of the NF with regard to any claimed benefit. The applicant who is proposing the NF should provide the EC with a complete set of information for an appropriate assessment according to Reg. (EU) 2017/2469 and further specified in the relevant EFSA's guidance documents. Complete information on the identity of the NF and its production process is crucial. Each component of the NF should be chemically characterised and quantified, and the identity proved with appropriate analytical techniques. In case of food 'consisting of, isolated from or produced with microorganisms' depending on the particular role of the microorganism and presence of genetic modifications, additional relevant information should be provided. Specific analyses to unequivocally confirm the structure of the NF should be performed, also by comparison to commercially available high-purity standard. Information on stability in relevant food matrices as well as batch specifications should be also provided. What is crucial for all NF and especially true for HiMO is the clear definition of the intended uses and use levels, to allow an estimate of the intake based on the EFSA Comprehensive European Food Consumption Database (the main source of information on food consumption at an EU level). This estimate is the basis for the risk assessment since it has to be compared with the reference point identified in toxicological studies or, as for HiMO, with the estimated natural intake in breastfed infants. To be noted that concentrations of milk oligosaccharides in breast milk show a huge variability and are depending upon several factors. Therefore, it is essential to collect updated information to derive reliable natural intake estimates. The standard toxicological approach for a NF is generally limited to two *in vitro* studies to exclude any genotoxic concern from NF components and followed by an *in vivo* toxicity study to assess toxicities further to a sub-chronic exposure in a standard animal model. For HiMO that are natural components, provided that the identity is confirmed and no concerns are identified in the toxicological studies, the assessment is mainly based to a comparison with the natural intake in breastfed infants that should not be exceeded. The intake in breastfed infants on a body weight basis is expected to be safe also for other population groups.

IS027 / #61

INFANT FORMULA SUPPLEMENTED WITH MANUFACTURED HUMAN-IDENTICAL MILK OLIGOSACCHARIDES AND HEALTH OUTCOMES: A REVIEW

PARALLEL SESSION 09: HUMAN MILK OLIGOSACCHARIDES: AN UPDATE

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Human milk oligosaccharides (HMOs) are complex, non-digestible carbohydrates that constitute the third most abundant solid component of human milk, following lactose and lipids. Although HMOs do not provide direct nutritional value to the infant, they play a crucial role in early-life health by shaping the gut microbiota, modulating immune development, strengthening gut barrier function, and acting as soluble decoy receptors that prevent pathogen adhesion to the intestinal epithelium. The composition and concentration of HMOs vary considerably between individuals and across lactation, contributing to the biological complexity of human milk. Recent advances in biotechnology have enabled the industrial production of structurally identical oligosaccharides to those naturally present in human milk. These compounds, referred to as human-identical milk oligosaccharides (HiMOs), are synthesized through microbial fermentation or chemical processes and can now be added to infant formula. The most commonly used HiMO in commercial formulas is 2'-fucosyllactose (2'-FL), often in combination with other neutral or sialylated oligosaccharides such as lacto-N-neotetraose (LNnT), 3-fucosyllactose (3-FL), lacto-N-tetraose (LNT), 3'-sialyllactose (3'-SL), and 6'-sialyllactose (6'-SL). Clinical studies in healthy term infants have primarily focused on evaluating the safety, growth adequacy, gastrointestinal tolerance, and potential health effects of HiMO-supplemented infant formulas. Across multiple randomized controlled trials, supplementation with HiMOs has consistently been shown to support normal infant growth. No clinically relevant differences have been observed between infants receiving HiMO-supplemented formulas and those receiving standard formulas with respect to weight gain, length, head circumference, body mass index, or growth velocity. These findings demonstrate that the inclusion of HiMOs in infant formula is compatible with normal somatic growth during the first year of life. Gastrointestinal tolerance has also been extensively assessed. Overall, HiMO supplementation does not appear to increase gastrointestinal adverse effects such as vomiting, regurgitation, excessive crying, or colic. However, formulas containing higher total concentrations of HiMOs, particularly those incorporating multiple oligosaccharides at levels approaching those found in human milk, have been associated with softer stools and increased stool frequency. These stool characteristics more closely resemble those observed in breastfed infants, although the clinical significance of this finding remains uncertain, particularly in the absence of associated improvements in gastrointestinal symptoms. Interest has also focused on the potential immunomodulatory effects of HiMOs, including a possible role in reducing infections during infancy. Some studies have reported a lower incidence of respiratory infections, reduced antibiotic use, and fewer febrile episodes in infants fed HiMO-supplemented formulas, particularly those containing combinations of fucosylated and neutral oligosaccharides. However, these findings have not been consistently replicated across studies, and most trials were not specifically designed or powered to assess infection-related outcomes. As a result, current evidence does not allow firm conclusions regarding a protective effect of HiMOs against infections.

Safety data across studies are reassuring. HiMO-supplemented formulas have been well tolerated, with no consistent differences in adverse events compared with control formulas. Although isolated findings such as a slightly higher incidence of hematochezia have been reported in individual studies using higher HiMO concentrations, these observations have not been consistently reproduced and have not been associated with clinically relevant consequences. In summary, the addition of human-identical milk oligosaccharides to infant formula represents a significant technological advance toward narrowing the compositional gap between human milk and formula. Current evidence indicates that HiMO-supplemented formulas are safe, well tolerated, and capable of supporting normal growth in healthy term infants. However, beyond effects on stool characteristics, clear and consistent clinical benefits have not yet been established. Further high-quality, independent studies focusing on clinically meaningful outcomes are needed to better define the role of HiMOs in infant nutrition.

IS028 / #64

NUTRITION AND EOSINOPHILIC ESOPHAGITIS

PARALLEL SESSION 10: THE ROLE OF NUTRITION IN CHRONIC GI DISEASES

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Eosinophilic esophagitis (EoE) is a chronic, immune-mediated clinicopathologic disease characterized by symptoms of esophageal dysfunction and histological evidence of eosinophil-predominant inflammation. Its incidence and prevalence have increased worldwide, and it is now a major cause of dysphagia and food impaction in children and adolescents. EoE has a multifactorial pathophysiology involving genetic susceptibility, epithelial barrier dysfunction, and a predominantly Th2-driven immune response to antigens. When the esophageal barrier is disrupted, antigen exposure triggers a cytokine cascade that promotes eosinophil recruitment, persistent inflammation, and tissue remodeling. If untreated, this process may progress to fibrosis and esophageal strictures, contributing to long-term complications and reduced quality of life. Food antigens are considered the main triggers of inflammation, which supports dietary therapy as a cornerstone of treatment. Diet is currently the only intervention that directly targets the presumed underlying cause of EoE and may reduce the need for long-term medication exposure. Importantly, EoE is largely a non–IgE-mediated hypersensitivity condition, explaining why conventional allergy testing such as skin prick testing or serum specific IgE often fails to reliably identify causative foods. Therefore, empiric elimination diets are frequently used, removing selected foods and assessing response clinically, endoscopically and histologically after elimination and during reintroduction. The Six-Food Elimination Diet (SFED), which excludes milk, wheat, egg, soy/legumes, nuts, fish/seafood, achieves remission in approximately 63.9% of patients, while the Four-Food Elimination Diet (FFED) achieves remission in about 54.7%. More recent evidence supports less restrictive approaches, including one- and two-food elimination diets. A one-food elimination diet targeting cow's milk (OFED) yields remission rates around 46.4%, and a two-food elimination diet (TFED) achieves approximately 44.3%. Across studies, cow's milk is consistently the most common trigger, and, to a lesser extent, egg and legumes. To improve feasibility, adherence, and quality of life, current practice increasingly favors step-up strategies, starting with the elimination of one or two high-probability triggers and escalating only if remission is not achieved in motivated patients and families. Compared with starting with highly restrictive protocols, this approach can reduce diagnostic time and the number of endoscopic procedures while maintaining overall effectiveness. Despite its benefits, dietary therapy presents important challenges. Specialized allergen-free foods may increase grocery costs, and dietary restriction can significantly affect quality of life due to social limitations, anxiety, and isolation related to eating outside the home. In addition, monitoring response often requires repeated endoscopies with biopsies, although minimally invasive tools may reduce dependence on gastroscopies in the future. Nutritional considerations are critical because EoE itself can compromise growth and feeding behaviors. Feeding difficulties are common (13% to 75%), including food refusal, prolonged mealtimes, grazing, or adaptive behaviors such as excessive chewing. Failure to thrive has been reported in 10.5% to 30.6% of children. Elimination diets may increase the risk of malnutrition, growth faltering, and unintentional weight loss if energy and

protein intake are insufficient, and may contribute to deficiencies in calcium, vitamin D, iron, and B vitamins. Dietary restriction can also increase the risk of inducing or worsening disordered eating behaviors, including Avoidant/Restrictive Food Intake Disorder (ARFID), particularly in vulnerable children with feeding aversion or anxiety around eating. Moreover, patients already following strict avoidance due to IgE-mediated food allergies may not be ideal candidates for additional eliminations. In conclusion, dietary therapy is an effective and etiologically targeted treatment option for EoE, especially when less restrictive and step-up strategies are used, and candidates are carefully selected. Given its potential impact on quality of life, nutritional status, and ARFID risk, dietary treatment should be monitored by a multidisciplinary team, ideally including a registered dietitian, to ensure safe and sustainable long-term management.

IS029 / #66

PRECISION NUTRITION IN PEDIATRIC IBD

PARALLEL SESSION 10: THE ROLE OF NUTRITION IN CHRONIC GI DISEASES

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Stratified and precision nutrition refers to disease management or prevention of disease onset, based on dietary interventions tailored to a person's characteristics, biology, gut microbiome, and environmental exposures. Such treatment models may lead to more effective management of inflammatory bowel disease (IBD) and reduce risk of disease development. There is scarce literature upon which we can make recommendations for precision or stratified dietary therapy for IBD, both for risk of disease development and disease management. Certain single-nucleotide polymorphisms related to polyunsaturated fatty acid (PUFA) metabolism may modify the effect dietary PUFA have in increasing the risk of IBD development. Non-colonic CD, mild-to-moderate CD, and high microbiota richness may predict success of EEN and may be used both for prediction of treatment continuation, but also for early cessation in nonresponders. There is currently insufficient evidence to make recommendations for precision or stratified dietary therapy for patients with established IBD. Despite the great interest in stratified and precision nutrition, we currently lack data to support conclusive recommendations. Replication of early findings by independent research groups and within structured clinical interventions is required.

IS030 / #68

CLINICAL PRACTICE - THE DIFFICULTIES OF MEASURING LENGTH OR HEIGHT IN PATIENTS AND PRACTICAL/CLINICAL CONSEQUENCES, PREDICTING HEIGHT FROM OTHER MEASUREMENTS

PARALLEL SESSION 11: MEASURING GROWTH AND ITS ASSOCIATION WITH OUTCOMES – HEIGHT AND BEYOND

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Height is an important anthropometric measurement in clinical practice that is used to assess normal growth but also forms a key component of nutritional assessment. However, a substantial proportion of children in hospital might be unable to stand to be measured, and patient conditions (critical illness, bedridden patients with neuromuscular, spinal or developmental disorders) might be common barriers to taking an accurate measurement. Availability of calibrated equipment, staff training, procedures on admission and time constraints could make measurements difficult to execute, resulting in inaccurate/low reporting in patient records. Alternative measurements have been proposed to estimate height: arm span, ulna or tibia lengths. There is some evidence on their use in adults or children with specific conditions (e.g. cerebral palsy) but only a few focusing on pediatric patients with a range of different clinical conditions. Practicality is also important, as some measurements require special equipment or challenging measurement body positions. Results are presented on the use of ulna and tibia lengths to estimate height in a diverse group of children at a tertiary referral hospital in the UK, highlighting practical and clinical considerations, accuracy of published equations, as well as newly developed equations from healthy UK children. Ultimately, there is still limited evidence on the most appropriate way to estimate height in a diverse pediatric population. Future studies could investigate the performance of these equations or generate prediction equations for different populations/ settings to improve accuracy of height estimates in children with complex conditions.

IS031 / #69

PUBLIC HEALTH - THE USE OF SEGMENTAL MEASUREMENTS VERSUS LENGTH OR HEIGHT TO EVALUATE THE SHORT- AND LONG-TERM EFFECTS OF STUNTING

PARALLEL SESSION 11: MEASURING GROWTH AND ITS ASSOCIATION WITH OUTCOMES – HEIGHT AND BEYOND

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Stunting is statistically defined as height-for-age Z-score (HAZ) more than two standard deviations below the WHO reference mean. Global monitoring uses this threshold, but linear growth faltering affects many children who do not meet this arbitrary cut-off, and reliance on total length or height alone may obscure important heterogeneity in growth restriction. Standing height (or recumbent length in infancy) reflects cumulative growth across multiple body segments that differ in developmental timing, biological sensitivity, and functional significance. Increasing evidence suggests that segmental anthropometric measurements provide complementary insights into the timing, severity, and long-term consequences of early-life growth faltering across the life course. Limb lengths, particularly leg length, are highly sensitive to early childhood nutrition and environmental conditions. Shorter leg length and lower leg-to-height ratios have been associated with poorer early-life socioeconomic conditions and increased cardiometabolic risk in adulthood, including insulin resistance and hypertension. Distal limb segments such as tibial or knee–heel length respond rapidly to nutritional change in infancy and early childhood, allowing detection of short-term growth perturbations or recovery with greater precision than total length. Children living in nutritionally constrained environments often show disproportionate limb shortening. Although leg length is strongly correlated with adult stature, it appears to capture sensitivity to early-life exposures that total height alone may not. Arm span closely tracks height across childhood and adolescence and mainly serves as a practical alternative when standing height cannot be reliably measured. Trunk growth, assessed through sitting height, appears relatively preserved compared with limb growth under nutritional constraints. Sitting height is positively associated with lung capacity, but has also been linked to higher blood pressure and cardiometabolic risk when disproportionately large relative to total height. Assessing sitting height alongside leg length enables differentiation between trunk-dominant and limb-dominant growth patterns. A phenotype characterised by shorter legs and relatively greater sitting height is interpreted as a marker of early childhood deprivation and later cardiometabolic risk. Head circumference provides a critical window into early brain growth, particularly during the first 1,000 days of life. Many studies demonstrate associations between early head circumference and later cognitive outcomes, especially in high-risk pre-term or malnourished populations. While head circumference does not universally associate with neurodevelopment, it remains a valuable complementary indicator to linear growth for identifying neurodevelopmental vulnerability across the life course. Other circumferential measures offer insight into body composition and functional reserve that linear measures cannot capture. Mid-upper arm circumference (MUAC) reflects muscle and fat mass and is a strong predictor of short-term mortality

in young children. Persistently low MUAC among stunted or wasted children suggests sustained vulnerability. Waist, hip, thigh, and calf circumferences provide information on fat distribution, muscle mass, and physical capacity, linking early growth restriction to later risks of central adiposity and cardiometabolic disease. The Zimbabwean SHINE cohorts show that early-life height, head circumference, and MUAC predict distinct school-age physical and cognitive outcomes. Beyond metabolic and functional outcomes, impaired linear and segmental growth has implications for both female reproductive health and foetal growth restriction. Short female adult stature may associate with obstructed labour, caesarean delivery, and maternal mortality. Growth constraints during childhood and adolescence influence pelvic development, contributing to obstetric risk among women who experienced early-life stunting. Although direct pelvic measurements are rarely available, stature and particularly tibial length may reflect pelvic growth. In summary, height-for-age remains useful for population-level monitoring of stunting but provides an incomplete picture of growth biology and long-term risk. Segmental anthropometry—including limb lengths, sitting height, head circumference, and selected circumferences—adds biologically meaningful information, improving understanding of when and how growth faltering occurs and its consequences across the life course and across generations and health outcomes.

IS032 / #182

LOW CARB DIET IN HEALTH AND DISEASE

PARALLEL SESSION 12: SYNERGIES IN CARE: NUTRITION AND GROWTH

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Low-carbohydrate diets (LCD), generally defined as carbohydrate intake below 26% of total energy or less than 130 g/day, have seen a resurgence in clinical interest for managing various metabolic conditions, most notably type 1 diabetes (T1D). Evidence from recent randomized controlled trials indicates that LCD significantly enhances glycemic control by increasing time in range (TIR) and reducing both average glycemia and the frequency of hyperglycemia. These improvements are typically achieved alongside a substantial reduction in total daily insulin doses. Beyond metabolic markers, LCD serves as a potent intervention for weight management, leading to significant decreases in body weight, BMI, and body fat percentage. Crucially, recent objective assessments show that these anthropometric changes occur without compromising dynamic muscle functions, such as strength or power, in young populations. In addition to diabetes and obesity management, very-low-carbohydrate (ketogenic) diets (VLCD), restricting intake to below 10% of energy, remain an established therapeutic tool for treating refractory epilepsy. The restriction of carbohydrates also induces distinct physiological shifts in the gut environment. Research demonstrates an increase in microbial alpha diversity but a reproducible depletion of beneficial taxa, likely due to reduced availability of complex polysaccharides or gluten-derived nutrients. Metabolomic analysis further reveals fingerprints of higher protein and fat intake, characterized by increased fecal isovalerate and elevated urinary methylguanidine. Despite these clinical benefits, LCD carries potential long-term risks that necessitate careful oversight. These include concerns regarding growth retardation as well as dyslipidemia and micronutrient deficiencies in iron, fiber, or B vitamins. Furthermore, strict dietary restriction may increase the risk of disordered eating behaviors, particularly in adolescents. Consequently, while LCD represents a powerful metabolic tool, its application requires a patient-centered approach with rigorous clinical monitoring to balance therapeutic efficacy with long-term safety.

IS033 / #183

FAMILIAL SHORT STATURE: FROM BENIGN VARIANT TO CHRONIC ILLNESS

PARALLEL SESSION 12: SYNERGIES IN CARE: NUTRITION AND GROWTH

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Familial short stature (FSS) has traditionally been regarded as a benign growth variant characterised by short stature, normal growth velocity and attainment of an adult height consistent with mid-parental expectations. This perspective relies almost exclusively on auxological observation, assumes polygenic inheritance and presupposes the absence of underlying pathology. Such an approach may lead to underestimation of the clinical situation and insufficient diagnostic work-up in affected children. Contemporary evidence clearly demonstrates that “familial short stature” is not a biologically uniform entity. Recent studies employing modern genetic methods, including next-generation sequencing, have shown that monogenic autosomal-dominant causes can be identified in up to 40% of children clinically classified as FSS. The aetiology of monogenic FSS is heterogeneous. Primary disorders of the growth plate represent a major subgroup, but genetically determined growth hormone deficiency, growth hormone insensitivity, perturbations of the RAS–MAPK signalling pathway and defects in other fundamental intracellular mechanisms may also be involved. Importantly, children with monogenic causes of short stature cannot be reliably distinguished clinically from those in whom no genetic cause is detected and who are presumed to have polygenic short stature. Children with FSS may benefit from growth hormone (GH) therapy. This is well established, for example, in SHOX deficiency and Noonan syndrome, where efficacy has been consistently demonstrated. Moreover, a substantial proportion of children may qualify for GH treatment under the indication of SGA-SS (children born small for gestational age with persistent short stature) or, in selected cases, GH deficiency. Considering FSS a benign variant requiring no further evaluation may therefore prevent access to GH treatment in children who would benefit from this therapy. In the current era, FSS should be recognised as a purely descriptive term that denotes only that a child with short stature has at least one short parent, but conveys no information about the underlying pathophysiology. These children warrant appropriate diagnostic evaluation, including consideration of genetic testing. Growth hormone therapy should be contemplated using the same criteria applied to children whose parents have average stature.

IS034 / #184

EATING DISORDERS AND THEIR EFFECT ON CHILDREN'S GROWTH

PARALLEL SESSION 12: SYNERGIES IN CARE: NUTRITION AND GROWTH

Early-onset eating disorders—early-onset anorexia nervosa (EOAN) and avoidant/restrictive food intake disorder (ARFID)—are defined by an onset before 13 years of age. These conditions are clinically heterogeneous and frequently associated with psychiatric comorbidities, including anxiety disorders, autism spectrum disorder (ASD), and attention deficit hyperactivity disorder (ADHD). EOAN is characterized by restrictive eating driven by an intense fear of weight gain, whereas ARFID involves restrictive intake or food avoidance without weight or body-shape concerns and remains under-recognized. Malnutrition secondary to these disorders may lead to growth failure or arrest, delayed pubertal development, and impaired bone mineral acquisition during critical developmental periods. EOAN typically results in acute malnutrition with rapid weight loss, whereas ARFID is more often associated with chronic undernutrition, sometimes punctuated by acute episodes. In a resent comparative cohort evaluated during a first episode of acute nutritional deterioration, patients with ARFID showed shorter stature than those with EOAN, although growth velocity during the year preceding hospitalization was lower in EOAN. Beyond acute medical instability, several factors have been identified as key determinants of long-term growth outcome in children with restrictive eating disorders. Emerging data indicate that shorter time to diagnosis, younger age at illness onset, pubertal stage at onset, and the adequacy and timing of weight restoration are critical predictors of catch-up growth. (2) In particular, pre- and peripubertal patients appear especially vulnerable to irreversible height deficit if nutritional rehabilitation is delayed or insufficient. Early recognition of deviations from expected growth trajectories and prompt, aggressive nutritional management are therefore essential to preserve genetic height potential. Although nutritional rehabilitation usually restores linear growth, pubertal progression, and bone mineral accrual, a subset of patients continue to exhibit severe and persistent growth failure despite appropriate nutritional and psychological management, leading to reduced adult height. The potential benefit of growth hormone (GH) therapy has been investigated in this context. In an initial observational proof-of-concept study, 10 girls with EOAN and severe growth retardation (growth velocity ≤2 cm/year for at least 18 months despite nutritional rehabilitation) received GH at 35 µg/kg/day until adult height. At treatment initiation, mean age was 13.3±1.1 years, most were prepubertal (n=7), and mean bone age was 10.9±1.7 years. Nutritional status had improved prior to treatment initiation, with BMI increasing from −3.1±1.1 to −0.8±0.6 SDS during the preceding year. GH therapy induced a rapid acceleration in growth velocity in all patients, and adult height was close to mid-parental target height. These findings were further supported by a randomized double-blind placebo-controlled trial conducted over one year, which demonstrated both the efficacy of GH treatment on linear growth velocity and its safety profile. These findings suggest that GH therapy may represent a therapeutic option in selected patients with severe growth failure related to early-onset eating disorders, as an adjunct to optimal nutritional and psychological management.

IS035 / #72

WHY THE INTAKE OF WHOLE FOOD MATTERS: BACKGROUND PHYSIOLOGY

PARALLEL SESSION 13: ROLE OF WHOLE FOOD VS FORMULA FEEDS IN THE TREATMENT OF DISORDERS IN CHILDREN

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With respect to food intake, the food components that adhere to the intestinal mucosa are not simply the result of the digestion of carbohydrates, fats, and proteins, and are not homogeneously dispersed. The final result of food digestion can be viewed as a complex microstructure called a food matrix, in which dietary components behave and react differently than when isolated or in a free state. The bioaccessibility and the bioavailability of nutrients are directly related to the food matrix, and it is well described that, depending on the matrix content, the absorption of a single nutrient can vary from a minute amount to almost 100%, as is the case for calcium absorption, which ranges from <10% to >50% of calcium in the foods. These differences can be related to interactions with other food components in the food matrix, which are affected by various factors, including fermentation and conditions encountered in the gastrointestinal tract. Furthermore, emerging scientific evidence suggests that the complex food matrix influences the secretion of GUT hormones and mucosal immunity either directly, through microbiome adaptations, or by initiating epigenetic changes. For decades, physicians (including pediatricians) recommended excluding entire food groups from the diet or adding a single food type (even a food component) to improve health or prevent disease, with allergy being a classic example. Yet the latest evidence emphasizes the role of a diversified whole-food intake in benefiting not only overall health but also in preventing chronic disorders, including food allergy in children. Diversified food intake, creating a complex food matrix, is implicated in improved motility, rapid epithelial renewal, in promoting immune tolerance rather than inflammation, and in supporting small intestinal mucosal barrier function, to mention just a few of the investigated benefits. The background physiology behind the benefits of the whole/unprocessed diversified diet is the aim of this presentation.

IS036 / #74

PRACTICAL APPROACH TO THE USE OF WHOLE FOOD & WHOLE FOOD BASED ENTERAL FORMULAS IN DISEASED CHILDREN

PARALLEL SESSION 13: ROLE OF WHOLE FOOD VS FORMULA FEEDS IN THE TREATMENT OF DISORDERS IN CHILDREN

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Commercially available enteral nutrition has come full circle in the last 50 years. Before 1973, when the first nutrient-intact formula came on the market, enteral nutrition consisted of blended foods. The use of commercial enteral formulas became standard practice in hospitals because of the decreased risk of microbial contamination and ease of administration. There has been a shift in consumer trends towards food selection and consumption, with a preference for whole foods, organically grown, and locally sourced, driven by perceived health benefits. This health-conscious trend has filtered through to paediatric home enteral nutrition, with an increased desire of parents/carers to prepare homemade food blends. There are many reasons for the use of homemade blended enteral feeds, including better tolerance than commercially available enteral formulas, perception of nutrition benefits from homemade food as a result of the variety of food items and the option of tailoring to special needs. Psychosocial aspects also have an influence; for example, the desire to feed one's child and serve the same foods as the rest of the family The American Society for Parental and Enteral Nutrition (ASPEN), European Society of Parenteral Hepatology Gastroenterology and Nutrition (ESPHGAN) and the British Dietetic Association have developed practice guidance on the use of blended tube feed. To meet the demands of consumers for blended tube feeds, manufacturers began marketing commercially prepared food-based enteral formulas. In an acute clinical and community setting, a blended tube feed is contraindicated in patients who are immunocompromised or require post-pyloric feeding as a result of a food safety risk. Other contraindications for blended diet include children who require continuous pump feeding via gastrostomy or nasogastric feeding tube (< 12 Fr) and fluid restrictions. Clinicians are responsible for prescribing the enteral tube feed best suited to meet the nutrient needs and metabolic demands of the patients; the "right formula for the right patient". Published literature on commercially available Food-based Formulas (FBF), suggests that they are well tolerated, improving both stool consistency and frequency. Of note, FBF's are primarily implemented by dietitians in children already established on enteral nutrition with reported gastrointestinal symptoms. A clinically significant observation is that dietitians are transferring children from amino acid and hydrolysed formulas to FBF's formula. However, dietitians are increasingly implementing an FBF as their first-line whole protein enteral formula in children with no underlying gastrointestinal symptoms. Furthermore, in an acute clinical setting, FBF was implemented as a compromise to an enteral blended diet when requested by parents. Although the exact mechanisms as to why EFIs and blended tube feeds are better tolerated in some children remain unclear. One theory that has been postulated is associated with the amount and mixture of fibre and the subsequent beneficial impact on the gut microbiome. Non-digestible dietary fibre undergoes fermentation by the intestinal microbiota to produce short-chain fatty acids, which positively impact the local and systemic

immune system. The diversity of the gut microbiome is influenced by the variety of the diet; a diet solely of commercial enteral feeds has been implicated in reducing the diversity of microbial species in the gut microbiome; therefore, enteral formulas containing fibre may support normal digestive health. Commercial tube feeds devoid of fibre appear to negatively alter children's gut microbiome. To substantiate these findings, a large, multicentre interventional study is needed, randomising patients to either a FBF or standard polymeric formula (with fibre), to allow investigation of clinical and nutritional outcomes.

IS037 / #77

COMPLEMENTARY FEEDING DILEMMAS AND QUESTIONS IN EUROPEAN SETTINGS

PLENARY SESSION 02: CONTEXT-SPECIFIC COMPLEMENTARY FEEDING

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Complementary feeding dilemmas and questions in European settings *Julie Lanigan* Childhood Nutrition Research Center, UCL Great Ormond Street Institute of Child Health, University College London, United Kingdom **(600 words)** Complementary feeding is a critical period for growth and development that influences short- and long-term health. Stores of essential nutrients such as iron and vitamin D may become depleted by 6 months of age. Milk alone is no longer sufficient to meet needs for all essential nutrients which must be provided by an expanded diet. Optimal nutrition is essential to support rapid growth and development of the brain and essential organs. Suboptimal nutrition may lead to restricted growth and micronutrient deficiencies. Care should be taken to avoid over-nutrition. Excess protein intake during infancy is linked to faster growth, a risk factor for overweight and obesity, arguably the most serious nutritional disease facing today's children (1). Guidance on complementary was issued by the World Health Organization (WHO) in 2023 (2). This was intended to be widely applicable across a range of socioeconomic and health contexts. However, it is debatable whether global recommendations are equally applicable across diverse cultures. For example, living conditions in high-income countries, such as in Europe, differ from those in many low-to-middle income countries (LMIC). In many European countries food security is high, the burden of infectious diseases is lower, and socioeconomic status higher compared with many LMIC countries. Lifestyles vary both between and within countries and this may influence parental infant feeding priorities. For instance, working mothers, able to formula feed their infants in an affordable, feasible and safe environment may opt for this over continued breastfeeding, as recommended by WHO. WHO recommends complementary foods are introduced at "around 6 months," while breastfeeding continues. However, the risks and benefits of earlier introduction, for example, between 4 and 6 months, are uncertain. Evidence underpinning recommendations is limited, particularly regarding developmental readiness, micronutrient deficiency and introduction of allergens. The relevance of the guidance varies according to geographical setting, and it is argued that global recommendations should be context-specific (3). In its most recent complementary feeding guidance, WHO advised that Cow's milk could be given as a main drink to infants during the second half of infancy when formula feeding was not a safe, feasible and affordable option. This raised concerns among healthcare professionals because high intake of cow's milk during infancy is associated with increased risk of obesity. Obesity affects children from both low- and high-income countries. Infant formula is widely available, including in many LMIC. However, safe formula feeding may not be possible in all settings. For example, where access to clean water is limited and hygiene and sanitation sub-optimal. Hence, living conditions influence parental infant feeding choice. Infant feeding priorities may differ between and within countries. Feeding practices are influenced by factors such as living conditions, culture, socioeconomic status and lifestyle. Parents in European countries may have different priorities to those in LMIC. This presentation considers factors that should be taken into consideration in European countries to make infant feeding advice context specific. Protein Intake from Birth to 2 Years

and Obesity Outcomes in Later Childhood and Adolescence: A Systematic Review of Prospective Cohort Studies. Stokes, Alexandra et al. Advances in Nutrition, Volume 12, Issue 5, 1863 – 1876 WHO Guideline for Complementary feeding of infants and young children 6-23 months of age. Geneva: World Health Organization; WHO 2023. https://www.who.int/publications/i/item/9789240081864 Published October 16, 2023. Accessed January 26th, 2026. ESPGHAN et al., World Health Organization (WHO) Guideline on the complementary feeding of infants and young children aged 6 -23 months 2023: a multi-society response; Jul;79(1):181-188. doi: 10.1002/jpn3.12248. Epub 2024 May 14.

IS038 / #78

COMPLEMENTARY FEEDING DILEMMAS AND QUESTIONS IN ASIAN SETTINGS

PLENARY SESSION 02: CONTEXT-SPECIFIC COMPLEMENTARY FEEDING

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The Asian population is facing a triple burden of malnutrition. Similar to the global trend, the prevalence of wasting and stunting is decreasing, while the prevalence of overweight and obesity is rising, along with the problems of micronutrient deficiencies. Complementary feeding is crucial for maintaining optimal nutritional status in infants after the exclusive breastfeeding period and also serves as a bridge to foster a healthy eating habit as the child grows up. The feeding practice varies depending on family context, culture, socioeconomic status, and many other factors. The latest WHO guideline for complementary feeding was established in 2023. The guideline emphasizes the importance of the timely introduction of complementary feeding and continued breastfeeding during the complementary period. There is also a recommendation on dietary diversity, avoiding unhealthy foods and beverages, using fortified foods, and nutrient supplements. Each country developed a context-specific food-based dietary guideline (FBDG) to promote optimal complementary feeding practices among caregivers. FBDG provides information on the types and amounts of the diet according to infants' age to provide adequate nutrient and energy intake during the complementary period. Many countries use linear programming analyses to identify the gap between nutrient intake and requirements, and complementary food recommendations were developed to prevent micronutrient deficiencies during the complementary period. The most common inadequate micronutrient is iron. A policy on iron supplementation and/or anemia screening has been implemented, along with promoting the consumption of iron-rich foods in some areas. Despite efforts to communicate appropriate complementary feeding practices through FBDG and other methods, the adequacy and appropriateness of complementary foods remain questionable. This leads to malnutrition among infants and young children, who are in the period of rapid growth and development. Many studies have demonstrated factors associated with feeding practices, including socioeconomic status, caregiver educational level, culture, and belief-driven feeding practices. Many interventions have been implemented to improve complementary feeding practices and promote good nutrition status and healthy eating habits among infants and young children.

IS039 / #79

COMPLEMENTARY FEEDING DILEMMAS AND QUESTIONS IN AFRICAN SETTINGS

PLENARY SESSION 02: CONTEXT-SPECIFIC COMPLEMENTARY FEEDING

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Africa is possibly the most heterogeneous of all the continents with respect to factors that may influence parents' choices for complementary foods. There are huge gradients in terms of wealth and education and rural vs urban living. Over 60% of Africans now live in urban conurbations and rural to urban drift continues apace. There is also a huge range in soil types and climatic zones, and in staple food preferences that are usualy predicated upon what can be grown locally. There are differences in religious and traditional beliefs, and all of these variables that can influence complementary feeding practices are themselves in rapid flux. BREASTFEEDING RATES ACROSS AFRICA: Although trends are gradually improving, fewer than half the mothers in Africa adhere to the WHO recommendation of exclusive breastfeeding to 6 months and only 2 countries (Rwanda and Burundi) meet the WHO target. Around a quarter of Afrcan countries have enacted legislation in line with the WHO Code on Marketing of Breast Milk Substitutes. COMPLEMENTARY FEEDING IN RURAL AREAS: Although there can be great poverty in urban slum areas it is generally the case that rural populations tend to be poorer and have a restricted access to a diverse diet. They may also be less educated and have ingrained beliefs about when, what and how to start weaning. Knowledge around the basic principles of good nutrition is often weak or absent. Levels of growth faltering and malnutrition are often higher in rural areas. However, on the plus side, breastfeeding rates are usually much better and there is lower exposure to 'western' beliefs and commercial pressures that may undermine breastfeeding and the healthy transition to complementary foods. Education efforts can usefully concentrate on the advantages of dietary diversity and the importance of including animal-sourced foods even if their cost means that the amounts available are small. COMPLEMENTARY FEEDING IN URBAN AREAS: Women in urban areas are more likely to be influenced by social trends and marketing. They may also need to go to work and leave their children at home in the care of others. (There is no country in Africa that has legislated for paid maternity leave and only 11% have made progress towards offering workplace facilities for nursing mothers.) This generally undermines breastfeeding and accelerates the timing of introduction of weaning foods. In general, women in urban areas have greater purchasing power that would enable them to purchase higher quality foods but choices may not be well informed and often include 'junk' foods with high energy and low nutrient density. This contributes to teh growing levels of overweight and obesity in urban Africa. THE ROLE OF HEALTHCARE PROFESSIONALS: Healthcare professionals and organisations can play an important role in helping mothers to navigate the difficult transition from exclusive breastfeeding towards mixed feeding. This is especially critical in Africa where levels of nutritional literacy are often poor.

IS040 / #81

NUTRITIONAL ASSESSMENT IN A CHILD WITH NI

PARALLEL SESSION 14: CHILDREN WITH NEUROLOGICAL IMPAIRMENT (NI) – NUTRITIONAL NEEDS

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Nutritional assessment in children with neurological impairment (NI) represents a complex, multidimensional process that requires systematic, individualized evaluation. NI encompasses a broad group of conditions affecting the central nervous system, including cerebral palsy, characterized by impairments in motor function, cognition, speech, vision, and other neuromuscular functions. These children frequently present with gastrointestinal (GI) comorbidities, feeding difficulties, and altered growth patterns, all of which increase their vulnerability to undernutrition, micronutrient deficiencies, and impaired health-related quality of life. The ESPGHAN guideline provides a structured, evidence-based framework for assessing nutritional status and requirements in this population. A cornerstone of nutritional assessment is early identification of undernutrition, but in newer days also overnutrition. Indicators of malnutrition include weight-for-age z-score, triceps skinfold and mid-upper-arm fat or muscle area, as well as various clinical features. These indicators reflect the multifactorial nature of malnutrition, which arises from oral motor impairment, decreased mobility, chronic infections, increased metabolic stress, and feeding inadequacy. Anthropometric assessment must be adapted to the child's motor limitations, including spasticity, contractures, scoliosis, and inability to stand. Conventional weight-for-height indices may misrepresent body composition, particularly in children with cerebral palsy who often exhibit low muscle mass but disproportionately high fat mass. ESPGHAN therefore recommends a broader set of measurement tools. Weight should be obtained using wheelchair, sitting, or hoist scales. Standing height is rarely feasible, making segmental measures—such as knee height, tibial length, and ulnar length—more reliable for estimating stature. These alternative methods allow for consistent monitoring of growth trends when plotted against WHO or national growth charts, with the caveat that standard or condition-specific charts may not accurately reflect the heterogeneous growth patterns of children with NI. Assessment of body composition is another critical component. Skinfold thickness at the triceps and biceps provides an estimate of fat mass, though interpretation is complicated by the tendency of these children to accumulate fat in the abdominal region. Dual-energy X-ray absorptiometry (DXA) remains the criterion standard for evaluating fat mass, lean body mass, and bone mineral density. Lumbar spine DXA is typically preferred due to hip flexion contractures common in severe NI. Regular monitoring of fat mass and bone status is essential, given the interplay between nutritional adequacy, mobility, and bone health. Before laboratory testing, dietetic nutritional intake needs to be done by skilled dietitian. Dietetic evaluation includes use of different dietetic tools for assessment of dietary intake, dietary behavior (meal schedule, duration of meal, food and meal consistency preference) and possible nutritional risks. According to dietetic assessment it is recommended to do certain laboratory findings for detecting micronutrient deficiencies, which are common due to reduced oral intake, selective diets, or reliance on low-volume enteral feeding.

Deficiencies in iron, zinc, copper, vitamin D, folate, carnitine, and vitamin B12 occur frequently. Annual micronutrient evaluation is recommended, with special attention to hydration status, particularly given communication challenges and risks associated with drooling and dysphagia. Ultimately, nutritional assessment in a child with NI must include environmental and socioeconomic factors which can influence on nutritional, but also overall child care. Nutritional assessment has to be individualized, continuous, and multidisciplinary. It requires integrating anthropometric data, clinical observations, dietary history, feeding safety evaluation, laboratory markers, and body composition measures. Regular assessments—every 1 to 3 months in infants and every 6 months in older children—are essential for tracking growth trajectories and adjusting nutritional interventions. By adopting this structured and comprehensive approach, clinicians can optimize nutritional status, enhance overall health, and improve the quality of life for both the child and their caregivers.

IS041 / #82

NUTRITIONAL THERAPY IN A CHILD WITH NI

PARALLEL SESSION 14: CHILDREN WITH NEUROLOGICAL IMPAIRMENT (NI) – NUTRITIONAL NEEDS

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Children with neurological impairment have specific problems in relation to nutrition and present challenges that need to be addressed as standard good practice of care. Depending on the specific underlying condition, which may impair swallowing, intestinal motility and mobility, the specific limitation must be evaluated to organise a nutritional plan. Keeping a reasonable nutritional condition, though not modifying the underlying disease, affect immune response and prognosis in case of ensuing complications. The challenges may involve dysphagia or poor oral control, choking, gastro-oesophageal reflux, constipation or micronutrient deficiencies. Oral dysphagia may also limit compliance with ongoing medications. All the above issues need to considered, along with the nutritional assessment and expected evolution to keep or restore acceptable nutritional condition. A nutritional plan must then be established and discussed with parents. Whenever oral intake is feasible, it should be preferred to avoid invasive procedures and potential complications from them. The avoidance of liquids, preferring jelly consistency and purees may suit a good proportion of children. In case of doubt about risk of choking, dynamic studies of swallowing may be performed to assess function and suitability of oral feeding. If any specific nutrient deficiency is anticipated from restricted food intake, then supplementation must be considered. If expected caloric intake is not achieved by spontaneous oral ingestion, then assisted enteral support may need to be considered. The initial option in this case is a nasogastric tube (NGT). This does not prevent the child from being fed orally, but a nutritional supplementation may be given, preferably by bolus feeding, or continuous nocturnal drip. NGT may provide evidence that additional caloric intake helps to restore nutritional condition or prevent degradation. However, NGT is not devoid of risks or complications (accidental dislocation or removal, possible aspiration, trauma to nasal septum), so measures must be taken to reduce any of those risks. If enteral nutrition is considered essential for more than 3 months, then the option of percutaneous endoscopic gastrostomy (PEG) should be discussed with parents and planned. This is a simple procedure that does not prevent oral feeding if tolerated but ensures easy access to provide all needed nutrients and medication. The composition of the feeding, either ready-to-use preparations or blenderized feeds, depends on tolerance and preference of patients and parents. It is also important to monitor and manage intestinal motility, as limited mobility often leads to chronic constipation and abdominal discomfort that may lead to food refusal. In conclusion, nutritional assessment must be addressed alongside with other basic care considerations in all children with neurological impairment, tailoring the plan to each patient, to prevent degradation and worsening of the prognosis associated with the underlying condition.

IS042 / #84

ASSESSMENT AND TREATMENT OF GASTROINTESTINAL AND NUTRITIONAL COMPLICATIONS IN CHILDREN WITH NEUROLOGICAL IMPAIRMENTS

PARALLEL SESSION 14: CHILDREN WITH NEUROLOGICAL IMPAIRMENT (NI) – NUTRITIONAL NEEDS

Barbara De Koning
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Feeding difficulties and gastrointestinal (GI) complaints are widespread among NI patients and can cause significant pain and distress, interfering with the quality of life of patients and their families. Feeding difficulties are complex and require a multidisciplinary approach involving a specialised team who assess the different steps in oral and/or enteral feeding alongside the patient, their families, and carers. We will discuss the different feeding methods depending on whether the patient can receive oral feeds or requires gastric or post-pyloric (tube) feeding, as well as the rare indication of parenteral nutrition. NI patients are often challenged by episodes of pain and discomfort during or close to oral or enteral feeding, suggesting that they do not tolerate their feeds. This requires caregivers and the medical team to adjust the feeds, establish the cause of the pain and discomfort, and initiate treatment to address these troubling symptoms. We will discuss possible ways to address these challenging feeding and GI issues.

IS043 / #86

WHAT IS THE RELATIONSHIP BETWEEN EATING BEHAVIORS AND CHILDHOOD OBESITY?

PLENARY SESSION 03: EATING BEHAVIORS IN CHILDHOOD: A CROSSROAD BETWEEN OBESITY, MENTAL HEALTH AND EATING DISORDERS

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Childhood obesity is a complex, multifactorial disease resulting from the interplay between genetic susceptibility and environmental exposures across development. Eating behaviors constitute a key behavioral pathway through which these influences may operate, contributing to individual differences in obesity risk from early life. In pediatric populations, eating behaviors are typically conceptualized along two dimensions: food approach traits (e.g., food responsiveness, enjoyment of food, emotional overeating) and food avoidance traits (e.g., satiety responsiveness, slowness in eating, food fussiness). Food approach traits have been consistently associated with higher energy intake, increased responsiveness to external food cues, and greater consumption of energy-dense foods. In contrast, food avoidance traits are generally linked to lower overall intake and, in some cases, reduced obesity risk, although associations may vary by developmental stage and context. Longitudinal studies indicate that early appetitive traits prospectively predict subsequent weight gain and body mass index (BMI), underscoring the relevance of appetite self-regulation in shaping obesity trajectories. Evidence from twin and family studies demonstrates moderate heritability for eating behaviors. Furthermore, obesity-associated genetic variants are predominantly expressed in central nervous system regions involved in appetite control and reward processing. Mediation analyses suggest that eating behaviors partially account for the association between genetic liability and adiposity outcomes. At the same time, emerging findings point to potential bidirectional relationships, whereby obesity may influence the expression of certain eating behaviors, indicating shared biological pathways. From a neurobiological perspective, the interaction between homeostatic mechanisms regulating hunger and satiety and hedonic processes driving reward-based eating provides a coherent framework for understanding vulnerability in obesogenic environments. In contexts characterized by widespread availability and marketing of energy-dense foods, heightened food responsiveness and diminished sensitivity to internal satiety cues may exacerbate obesity risk. Overall, eating behaviors represent both mediators and correlates of childhood obesity. Clarifying their role within developmental and environmental contexts is essential for informing prevention strategies aimed at strengthening appetite self-regulation and promoting healthier food environments from early life onward.

IS044 / #87

WHAT IS THE RELATIONSHIP BETWEEN EATING BEHAVIORS AND THE RISK OF DEVELOPING EATING DISORDERS?

PLENARY SESSION 03: EATING BEHAVIORS IN CHILDHOOD: A CROSSROAD BETWEEN OBESITY, MENTAL HEALTH AND EATING DISORDERS

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Background
Researchers have questioned whether early eating behaviors play impact the risk of future eating disorders. The aim of this talk is to highlight important recent longitudinal studies conducted on this topic. Methods
This structured synthesis draws on findings from eight recent longitudinal studies conducted in 2013–2022 to examine associations between eating behaviors, psychological factors, and environmental influences with disordered eating outcomes. Data sources included community and cohort populations followed from childhood through young adulthood. Results
Childhood overeating is associated with a 7% increased risk of adolescent binge eating and a 1% higher risk of binge eating disorder, whereas persistent undereating and fussy eating predict anorexia nervosa with 6% and 2% higher risk differences, respectively (1). Among adolescents, high BMI strongly predicts future dieting (OR = 3.44)(2). Psychological, social and personality factors and parenting and peer environment also impact future eating disorder risk. Neuroticism predicts binge eating (OR = 1.32 at age 14), and conduct problems predict purging behaviors (OR = 1.42) (2). Early depressive symptoms and body image distortion increase the likelihood of future binge eating and extreme weight loss behaviors (3). Self-criticism independently predicts later binge eating, fasting, and purging (4). Authoritarian parenting increases the risk for extreme weight control and binge eating (5). Severe food insecurity has shown a sustained association with binge eating (prevalence ratio = 1.41) (6). Cyberbullying victimization is linked to emotional eating via self-objectification and low self-compassion (7). Conclusion
Longitudinal evidence underscores that early eating behaviors, psychosocial and personality factors jointly increase future eating disorder risk. For this reason, interventions promoting healthy eating attitudes, emotional regulation, and supportive family and digital environments may prove useful for eating disorder prevention (8). References Herle M, Stavola BD, Hübel C, Micali N. A longitudinal study of eating behaviours in childhood and later eating disorder behaviours and diagnoses. Br J Psychiatry. 2020;216(3):155–161. Robinson L, Zhang Z, Jia T, Millenet S, Daly M. Association of genetic and phenotypic assessments with onset of disordered eating behaviors and comorbid mental health problems among adolescents. JAMA Netw Open.2020;3(7):e2011513. Liechty JM, Lee M-J. Longitudinal predictors of dieting and disordered eating among young adults in the U.S. Int J Eat Disord. 2013;46(8):790–800. Zelkowitz RL, Cole DA. Longitudinal relations of self-criticism with disordered eating behaviors and nonsuicidal self-injury. Int J Eat Disord.2020;53(5):775–788. Zubatsky M, Berge J, Neumark-Sztainer D. Longitudinal associations between parenting style and adolescent disordered eating behaviors. Eat Weight Disord. 2015;20(2):187–194. Hazzard VM, Hooper L, Larson N, Neumark-Sztainer D. Associations between severe food insecurity and disordered eating behaviors

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IS045 / #88

IN WHAT WAYS DO EATING BEHAVIORS INTERACT WITH EMOTIONAL REGULATION AND MENTAL HEALTH IN CHILDREN AND ADOLESCENTS?

PLENARY SESSION 03: EATING BEHAVIORS IN CHILDHOOD: A CROSSROAD BETWEEN OBESITY, MENTAL HEALTH AND EATING DISORDERS

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Eating behavior and mental health are dynamically connected in youth through a reciprocal, reinforcing cycle. I will begin by outlining this vicious cycle, in which poor mental health contributes to impaired emotion regulation, which promotes emotional eating, which in turn worsens mental health through psychological and physiological pathways. Herein, emotion regulation difficulties can function not only as a mechanism driving eating behavior, but also as a moderator, determining when stress or low mood does lead to overeating. The core of the talk examines why children and adolescents overeat, focusing on psychological, physiological, environmental, and microbiota-related mechanisms. Within psychological factors, I will mainly highlight emotion regulation, next to reward sensitivity. I am drawing on findings from a systematic review and from my own previous work: longitudinal studies tracking developmental trajectories, laboratory stress-induction experiments, ecological momentary assessment capturing daily fluctuations, and an intervention study targeting emotion regulation skills. Second, I will discuss physiological drivers of emotional eating. Stress-induced cortisol responses interact with appetite-regulating systems involving leptin, ghrelin, and other gut hormones. Inflammation further links stress biology to altered eating patterns and reduced regulatory capacity. These biological mechanisms interact with environmental stressors, making adolescence a particularly vulnerable period for the emergence of stress-related overeating. Third, I will address the gut–brain–microbiota axis, summarizing evidence on how gut microbial composition and microbial metabolites influence stress responses, eating behavior, and emotional processing. I will discuss emerging findings showing bidirectional pathways through which stress alters microbial communities, which in turn affect eating behaviors and mental wellbeing. Finally, I will integrate the environmental context, including parents' roles through availability of foods, modeling, and parenting practices. I will also introduce newer work on the role of nature and natural environments as an innovative "outside-in" pathway supporting healthier dietary patterns through stress buffering, self-regulation, nudging and physiological influences. In the closing part of the talk, I shift direction to explore how healthy eating behaviors influence mental health and emotion regulation. Psychological pathways include reductions in regret, greater self-efficacy, and improved problem-solving skills. Physiologically, healthier diets shape cortisol rhythms, serotonin production, inflammatory processes, and the gut microbiota. Hence, diet can be positioned as a modifiable factor with central influence on stress and emotion regulation. Together, these perspectives underscore the need for an integrated biopsychosocial-exposome framework to understand and intervene in the complex relationships among eating behavior, emotion regulation, and mental health in young people.

IS046 / #89

HOW CAN EARLY IDENTIFICATION AND INTERVENTION TARGETING EATING BEHAVIORS IMPROVE LONG-TERM HEALTH OUTCOMES?

PLENARY SESSION 03: EATING BEHAVIORS IN CHILDHOOD: A CROSSROAD BETWEEN OBESITY, MENTAL HEALTH AND EATING DISORDERS

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Eating behaviors develop in early life and are further refined during childhood, shaping long-term food choices and dietary habits. However, although anatomy and physiology will develop with chronological age, eating behaviours are learned through a compelx feedback loop of experiential learning that informs the oral processing behaviours needed to accept and consume a wide variety of meal textures. During early weaning, new-borns rely on reflexes such as sucking, swallowing, and rooting to meet theirdaily energy and nutrient requirements. Throughout infancy and early childhood, children have high nutrient and energy requirements relative to their size due to the energy cost of growth and development, so it is critical that they acquire and optomise their eating skills to meet these needs. Early life experiences with food may have a lasting impact on oral anatomy, oral processing behavior and ultimately food preferences and dietary patterns. At around 6-months of age, infants transition from supine, dependent feeding with liquid foods, such as breast or bottle feeding, to upright, independent feeding with semi-solid and solid-foods. This rapid period of learning coincides with considerable anatomical and physiological changes, as the infant must learn to balance their head while the first teeth emerge, and they develop the muscle coordination needed to orally process and swallow food. Chewing is a complex motor-task that has to be learned, involving the coordination of 26 muscle pairs and 5 cranial nerves, to grip/bite, masticate and safely swallow the food being consumed. Every texture experience is an opportunity for the infant to learn the necessary skills to safely manipulate and swallow a food, and different texture challenges have to be ‘learned’ as they require unique oral processing skills that can only be aqcquired through experience. Despite this, research has shown a relatively poor alignment between the age-appropriate recomendations made at differebt timepoints during weaning, and the consistency of the texture challenges offered within food categories. Parents often rely on cues from their toddler to indcate their ‘readiness’ to transition to more complex textures, yet research has shown that neither age nor number of teeth can adequetely explain differences in oral breakdown for a test food. A childs developmental stage and experience with a diverse range of food textures is likely to be a better predictor of oral processing skills and food accetpance and subsequent dietary intakes. Toddlers that have developed more advanced chewing skills tend to exhibt higher acceptance for a broader range of food textures than those with less developed skills. These early food experiences shape the eating behaviours that become stable, and carry forward into later childhood, such as fast or slow eating and associated differences in energy intake. Differneces in habitual eating speed inform energy intake among school-age children, and the rate of growth and potential obesity risk. Understanding how early life development of oral processing skills and texture-based learning drives these behavirous is a

key opportunity to shape healthier eating patterns that become consistent and underpin optimum growth and development.

OP001 / #702

SIRT1 DELETION IN HYPERTROPHIC CHONDROCYTES DIFFERENTIALLY REGULATES SKELETAL GROWTH AND BONE ACCRUAL IN MALES AND FEMALES

ORAL PRESENTATIONS SESSION 01: CHILDHOOD & ADOLESCENCE

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Background and Aims: We investigated the role of SIRT1 in linear growth and bone structure, focusing on the response of the epiphyseal growth plate (EGP) to nutritional manipulation.
Methods: A ColX-Cre driver was used to target hypertrophic chondrocytes (HZ), and generate hypertrophic specific *Sirt1* knockout (CKO) mice. These mice were tested in a catch-up (CU) growth model involving food restriction followed by refeeding.
Results: *Sirt1* deletion in hypertrophic chondrocytes markedly impaired growth in males, with a 33% reduction in body weight and 10–11% shorter long bones and EGP height ($P<0.05$). In females, effects were milder (12% reduction in weight, 5–7% shorter long bones; $P<0.05$ in both) but EGP height was reduced similarly to the males. Under CU conditions, male CKO mice showed an unexpected exaggerated response, surpassing the weight and bone length of normally fed CKO, suggesting a unique role for SIRT1 in modulating the recovery from nutritional stress.
Conclusions: Targeted *Sirt1* deletion in the hypertrophic zone revealed a strong sex-dependent effect on skeletal growth and bone quality. Both male and female CKO mice exhibited growth impairment under normal conditions compared to littermate control (CTL), however while male showed hyper-responsiveness to refeeding, females CKO showed only moderate alterations. This targeted approach uncovers sex-dependent role for SIRT1 in regulating growth and bone quality, moving beyond its generally understood functions in cartilage and bone development. The distinct responses to both basal conditions and nutritional stress between sexes represent a significant new finding, extending its known role beyond general cartilage and bone development.

OP002 / #289

PLANT-BASED DIET QUALITY IN CHILDREN: IMPACT ON CARDIOMETABOLIC HEALTH, METABOLITE PROFILES, AND DIETARY COST

ORAL PRESENTATIONS SESSION 01: CHILDHOOD & ADOLESCENCE

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Background and Aims: Evidence on how plant-based diet quality affects children's cardiometabolic health is scarce. We investigated plant-based diet quality and cardiometabolic health in children, integrating metabolites and dietary costs to link biological mechanisms with public health implications.
Methods: We analyzed data from 3390 children in the Dutch Generation R Study. Dietary intake was assessed with food-frequency questionnaires at age 8. We constructed overall, healthful, and unhealthful plant-based diet indices (PDI, hPDI, uPDI). Multiple linear regression estimated associations of these indices with cardiometabolic measures at age 10, standardized for sex and age, and with serum metabolites and dietary costs. In 402 children, LC–MS/MS quantified serum amino acids, fatty acids, phospholipids, and carnitines. Dietary costs were estimated from a Dutch food price database.
Results: Higher hPDI scores were associated with lower systolic and diastolic blood pressure (-0.07 SDS per 10-hPDI score increment, 95% CI: -0.11, -0.02). Higher PDI and hPDI were associated with lower total cholesterol (e.g., hPDI: β = -0.06, 95% CI: -0.12, -0.01), but not with insulin and triglycerides. Metabolomic analyses showed that PDI was inversely associated with two amino acids, while uPDI was inversely associated with phospholipids and carnitines, including only nine phospholipids inversely associated with total cholesterol. Higher uPDI was associated with lower dietary costs, while hPDI was not associated with higher costs.
Conclusions: Gradual shifts toward healthy plant-based diets may offer an economically feasible strategy to improve children's cardiometabolic health, whereas the lower costs of unhealthy plant-based diets were accompanied by less favorable metabolic profiles.

OP003 / #377

RETHINKING PREGNANCY SEAFOOD RESTRICTIONS: A MULTI-COHORT SYNTHESIS REVEALS NEURODEVELOPMENTAL BENEFITS IN OVER 9,000 UK CHILDREN

ORAL PRESENTATIONS SESSION 01: CHILDHOOD & ADOLESCENCE

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Background and Aims: Pregnancy advisories limiting seafood intake remain controversial, potentially reducing maternal DHA/EPA intake during fetal brain growth. We synthesised high-quality evidence to re-evaluate whether current restrictions align with child neurodevelopmental outcomes.
Methods: Three UK prospective cohorts were reviewed: ALSPAC (n>8,900), the Southampton Women's Survey (n=217), and an ALSPAC behavioural-trajectory cohort (n=5,727). Prenatal seafood intake was assessed using validated FFQs. Outcomes included cognitive ability (WISC), behaviour (SDQ), and early developmental domains. Adjusted effect estimates were synthesised narratively.
Results: Evidence robustly supported beneficial associations between higher prenatal seafood intake and child neurodevelopment. ALSPAC children of mothers consuming >340 g/week were significantly less likely to have low verbal IQ (adjusted OR 1.48; 95% CI 1.16–1.90) and showed improved communication, fine motor, and social development. Oily-fish intake in early pregnancy (Southampton) predicted markedly lower hyperactivity (OR 0.34). Lower prenatal fish intake combined with high processed-food exposure predicted persistent conduct and emotional difficulties (ALSPAC subset).
Conclusions: Across multiple cohorts with biomarker-supported dietary assessment, higher prenatal seafood intake consistently benefits childhood neurodevelopment. These findings provide strong empirical grounds to reconsider restrictive pregnancy dietary guidelines and emphasise safe, DHA-rich seafood consumption.

OP004 / #561

ULTRA-PROCESSED FOOD CONSUMPTION AMONG CANADIAN YOUTH: FINDINGS FROM THE CANADIAN HEALTH MEASURES SURVEY

ORAL PRESENTATIONS SESSION 01: CHILDHOOD & ADOLESCENCE

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Background and Aims: Ultra-processed foods (UPFs) make up a growing share of children and adolescents' diets, raising concerns about their impacts on nutrition and health. Evidence on UPF consumption patterns among Canadian children and adolescents, however, remains limited. This study aims to compare sociodemographic characteristics of Canadian youth across varying levels of UPF consumption.
Methods: This study drew on Canadians 3-19 yrs. who participated in the 2016-19 Canadian Health Measures Survey (CHMS). Food frequency questionnaire data using the Nova classification system for food processing. Participants were grouped into quartiles based on the proportion of daily servings from UPF. Differences in sociodemographic characteristics across UPF quartiles were assessed using ANOVA for continuous and chi-square for categorical variables. Survey weights and bootstraps were applied for national representativeness.
Results: The study population consisted of 4865 participants (57.91% female). Canadian youth consumed an average of 3.95 servings per day of UPFs, ranging from 1.84 to 6.81 servings from the lowest to highest quartiles. Compared to the lowest quartile, those in the highest were more likely to be male ($p<0.0001$), in the lowest income quartile ($p<0.0001$), lowest household education ($p<0.0001$), Asian or Latin ($p=0.0005$), and report higher total servings of food ($p<0.0001$) and lower fruit and vegetable consumption ($p<0.0001$). No significant differences were observed for age.
Conclusions: Canadian youth consume substantial amounts of UPFs, with higher intake concentrated among socioeconomically disadvantaged groups. These findings highlight need for targeted public health strategies to address dietary inequalities and reduce UPF consumption in Canadian children and adolescents.

OP005 / #161

EFFECTS OF DAILY PEANUT CONSUMPTION COMBINED WITH A SCHOOL-BASED HEALTH PROGRAM ON COGNITIVE PERFORMANCE IN CHILDREN: PRELIMINARY RESULTS FROM THE PEANUTY STUDY

ORAL PRESENTATIONS SESSION 01: CHILDHOOD & ADOLESCENCE

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Background and Aims: Cognitive development during preadolescence is highly influenced by nutrition and lifestyle. The SEISMO program promotes healthy habits and adherence to the Mediterranean diet in schools. Peanuts, rich in unsaturated fats, fiber, and polyphenols, may further enhance cognitive performance. This study evaluated whether adding 25 g/day of roasted peanuts with skin to the SEISMO program improves cognitive outcomes in children aged 10–12 years.
Methods: A randomized, controlled, parallel-group trial was conducted in primary schools in the Barcelona metropolitan area. Eighty-three children (10–12 years) were assigned to either the SEISMO-only control group or the SEISMO + peanut intervention group for six months. Cognitive performance was assessed before and after intervention using validated tests: d2-R (attention), Stroop Test (executive function), WISC-V subtests (processing speed and working memory), and Raven's 2 (fluid intelligence). Emotional state was measured with the Children's Depression Inventory (CDI). Mixed ANOVA models were applied to evaluate within- and between-group changes.
Results: Compared with controls, children consuming peanuts showed significant improvements in attention (d2-R concentration and accuracy, $p<0.01$), processing speed (WISC-V Coding and Symbol Search, $p<0.05$), and executive function (Stroop Test, all conditions, $p<0.05$). No significant differences were observed in working memory, reasoning, or depressive symptoms. Adherence exceeded 85%, and no adverse events occurred.
Conclusions: Daily consumption of peanuts, combined with a school-based health program, enhances specific cognitive domain, particularly attention, processing speed, and executive control, in preadolescents. Incorporating nutrient-rich snacks such as peanuts may strengthen the cognitive impact of school health interventions.

OP006 / #284

ASSOCIATIONS BETWEEN MATERNAL AND CHILD FACTORS AND LIFESTYLE PATTERNS IN PRESCHOOL CHILDREN

ORAL PRESENTATIONS SESSION 01: CHILDHOOD & ADOLESCENCE

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Background and Aims: This study aimed to identify lifestyle patterns using two data reduction methods and to examine their associations with child and maternal factors in preschool-aged children.
Methods: The cross-sectional analysis included data on 4-year-old children (n = 662) from the Barwon Infant Study (BIS). Latent profile analysis (LPA) and principal component analysis (PCA) were used to derive lifestyle patterns based on dietary intake, PA, screen time, and sleep duration. Multivariable logistic and linear regression examined the associations between child and maternal factors and identified lifestyle patterns.
Results: LPA identified three lifestyle pattern profiles: 'Healthy' (61% of participants), 'Unhealthy' (25.4%), and Typical' (13.6%). PCA identified two dimensions of lifestyle scores: 'Healthy' (high fruits, vegetables, physical activity) and 'Unhealthy' (high discretionary foods, sweet beverages, screen time; low water). Higher maternal education was associated with a lower likelihood of children being in the 'Unhealthy' profile (RRR = 0.59, 95% CI: 0.36-0.96), whereas maternal obesity versus non-overweight was associated with a higher likelihood (RRR = 1.96, 95% CI: 1.11-3.48) compared to the 'Healthy' profile. Similarly, children of women with obesity had higher PCA-derived 'Unhealthy' lifestyle pattern scores than non-overweight (β 0.40, 95% CI: 0.18-0.63), whereas children whose mothers had bachelor's degree and higher were associated with lower scores on the 'Unhealthy' lifestyle pattern scores than those whose mothers completed only high school (β - 0.34, 95% CI: -0.56 to -0.13).
Conclusions: Both LPA and PCA can be leveraged to identify lifestyle patterns in childhood. Associations between child and maternal factors and identified lifestyle patterns were consistent across methods.

OP007 / #386

DIAGNOSTIC OUTCOMES AND FOLLOW-UP OF INFANTS WITH SUSPECTED FPIAP AND CMPA

ORAL PRESENTATIONS SESSION 01: CHILDHOOD & ADOLESCENCE

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Background and Aims: Cow's milk protein allergy (CMPA) is a common food allergy in infancy, yet diagnosis is challenging due to variable clinical presentations and inconsistent use of oral food challenges. This study aimed to assess the frequency of CMPA in infants with suspected milk-protein–related symptoms, including presentations suggestive of Food Protein-Induced Allergic Proctocolitis (FPIAP), and to evaluate their long-term outcomes.
Methods: A retrospective review was conducted of infants evaluated in a pediatric gastroenterology clinic between 2014 and 2023. Of 231 identified patients, 216 were included. Clinical features, feeding practices, and comorbidities were recorded. Families of children on an elimination diet were contacted for structured follow-up. The primary endpoint was confirmation or exclusion of CMPA through an oral food challenge.
Results: CMPA was suspected in 80 infants (37%). **CMPA was confirmed in 15 (6.9%)** and excluded in 47 (21.8%); follow-up data were missing for 18 (8.3%). Common alternative causes of hematochezia included infections (25%), anal fissures (9.9%), and recent rotavirus vaccination (7.3%). Follow-up was completed for 58 children after a median of 76 months (range 18–134). A moderate proportion reported ongoing gastrointestinal symptoms (27.6%) or other allergic conditions (19%), similar to findings from comparable cohorts. **Notably, 15.5% continued to restrict milk.**
Conclusions: These results highlight the diagnostic challenges of CMPA and FPIAP, as many symptoms were non-allergic in origin. Continued milk avoidance in children without confirmed CMPA indicates potential overtreatment. Standardized diagnostic procedures, consistent oral food challenges, and clear parental counseling are essential to reduce misdiagnosis and prevent unnecessary dietary restrictions.

OP008 / #417

MULTI-SCALE AI 'VIRTUAL PLACENTA' MODEL QUANTIFYING HOW FETO-PLACENTAL MOLECULAR MALNUTRITION SIGNALS TRANSLATE INTO GLOBAL CHILDHOOD STUNTING BURDEN

ORAL PRESENTATIONS SESSION 01: CHILDHOOD & ADOLESCENCE

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Background and Aims: Feto-placental disruptions in nutrient delivery, inflammation, and growth signaling are believed to shape early linear growth, but their contribution to global stunting is unknown. Because surveys cannot capture these molecular processes, we developed a multi-scale AI "Virtual Placenta" model using omics datasets to quantify how feto-placental molecular malnutrition signals influence infant growth trajectories and worldwide stunting burdens.
Methods: We integrated placenta-derived RNA sequencing, cord blood transcriptomics, and cord blood DNA methylation from GEO cohorts of pregnancies complicated by fetal growth restriction and preeclampsia. A unified latent molecular malnutrition factor was constructed using multi-omics factor analysis summarizing impaired nutrient-transport pathways, suppressed IGF/mTOR signaling, and heightened inflammatory activation. This factor was aligned using deep domain adaptation to two publicly available infant microbial–metabolic cohorts with paired longitudinal growth measurements. A proxy model was then trained within Demographic and Health Surveys using maternal stature, BMI, anemia, WASH, early feeding, and environmental exposures, and projected to 412,583 children across 35 countries. Causal mediation and counterfactual simulations were estimated using targeted maximum likelihood.
Results: Higher modeled placental stress was consistently associated with reduced infant growth (β per +1 SD = –0.34 LAZ; 95% CI –0.41 to –0.27) and slower six-month growth velocity (–0.21 z-score/month; 95% CI –0.27 to –0.14). Globally, this molecular pathway explained 29.7% (95% CI 23.4–36.5%) of stunting, rising to 42.8% in highest-burden settings. A simulated one-SD reduction yielded a 9.4% (95% CI 7.2–12.1%) decrease in stunting prevalence, surpassing WASH-only or diet-diversity interventions.

Conclusions: Feto-placental molecular malnutrition represents a major, quantifiable biological pathway driving early childhood stunting worldwide.

OP009 / #308

DEVELOPMENT, INTERNAL AND EXTERNAL EVALUATION OF AN ARTIFICIAL INTELLIGENCE ALGORITHM FOR CHILD GROWTH MONITORING

ORAL PRESENTATIONS SESSION 01: CHILDHOOD & ADOLESCENCE

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Background and Aims: We aimed to develop, internally and externally evaluate an artificial intelligence (AI) algorithm to detect abnormal growth trajectories in children.
Methods: We used pre-diagnosis height measurements for children with a diagnosis of growth hormone deficiency (GHD, n=86) or Turner syndrome (TS, n=87) and all height measurements of a cohort of apparently healthy children (referents, n=815), living in France. We modeled the individual height trajectories using non-linear mixed models for each new measurement. We developed predictive models with multinomial logistic regression from the resulting growth parameters across five pre-defined age ranges from 1 to 12 years. For the five age-specific predictive models, we studied the discrimination and calibration curves, and retained the risk thresholds that offered a pre-defined specificity of 98%. Then, we evaluated the overall cumulative diagnostic performance and the theoretical reduction in time to diagnosis offered by the algorithm. We evaluated these models internally (10-fold cross-validation) and externally from a regional sample of children with GHD (n=77) or TS (n=40) and a national sample of apparently healthy children (n=5,503).
Results: The five age-specific predictive models had high AUROC (range 0.893-0.989) and good calibration. External evaluations revealed overall cumulative sensitivity and specificity of 86.3% (95% CI 78.7-92.0) and 92.7% (91.0-93.3), respectively. The median theoretical reduction in time to diagnosis was 2.2 years (interquartile range 0.9-4.3): 1.7 years (0.5-3.0) for GHD and 3.2 years (2.2-7.0) for TS.
Conclusions: We developed, internally and externally evaluated an AI algorithm with high diagnostic performance to help the early detection of GHD and TS in primary care practice.

OP010 / #105

ASSOCIATIONS OF MATERNAL PLASMA LIPID PROFILES WITH BREASTMILK AND INFANT PLASMA LIPID PROFILES IN THE FIRST 6 MONTHS POSTPARTUM

ORAL PRESENTATIONS SESSION 02: GROWTH, MICROBIOME AND BIG DATA

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Background and Aims: Lipids, the second most abundant component of breastmilk (BM), are key nutrients for infant development and may reflect maternal lipid status. We examined associations between maternal plasma, BM, and infant plasma lipids, and their change over time.
Methods: We collected BM and plasma at week 6 (wk6) and month 6 (mo6) postpartum from 60 age- and BMI-matched women from a Kenyan cohort. We performed targeted lipidomics using the Sciex Lipidyzer. Linear mixed models estimated associations between maternal and BM lipids, and BM and infant lipids. HIV and time were included as fixed effects, with matched pairs as random effects. Benjamini-Hochberg-adjusted p-values <0.05 were significant.
Results:

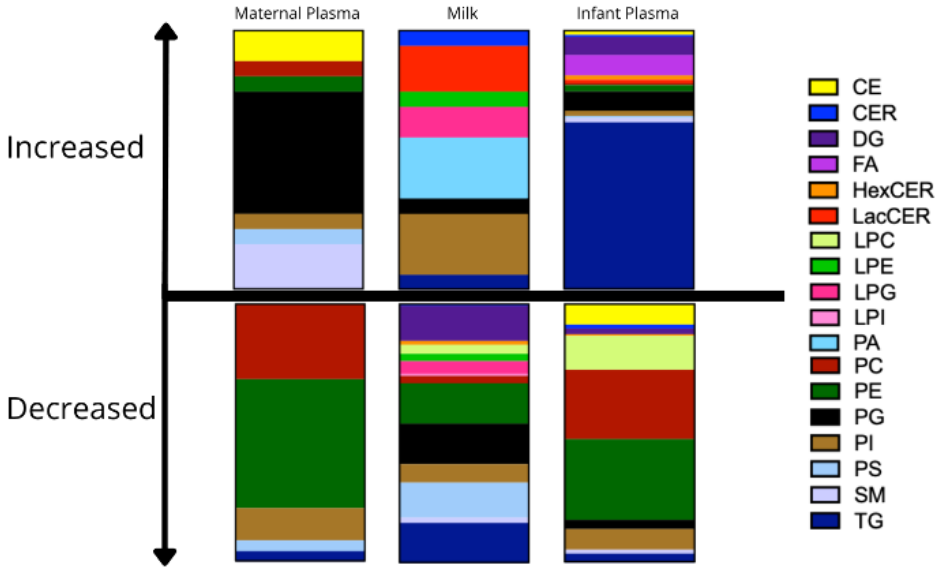

Figure 1. Lipid changes from 6 weeks to 6 months in maternal plasma, milk, and infant plasma. Lipid species grouped by class. Width of band determined by proportion of lipids represented. CE- Cholesterol Ester; Cer- Ceramides; DG- Diacylglycerol; FFA- Free fatty Acids; HexCER- Hexosylceramides; LPC- Lysophosphatidylcholine; LPE- Lysophosphatidylethanolamine; LPG- Lyso-phosphatidylglycerol; LPI- Lysophosphatidylinositol ; LPS- Lipopolysaccharides; LacCER- Lactosylceramide; PA- Phosphatidic acid; PC- Phosphatidylcholine; PE- Phosphatidylethanolamine; PG- Phosphatidylglycerol; PI- Phosphoinositides; PS- Phosphoserine; SM- Sphingomyelin; TG- Triacylglycerol

Among 1456 lipids, most maternal plasma concentrations were unchanged from wk6 to mo6, with only 15 increasing and 26 decreasing significantly (Figure). Between maternal plasma and BM, 188 lipids showed significant positive and 3 negative associations; 84.6% of positive were triglycerides, and all negative were phosphatidylglycerols. From wk6 to mo6, 18 BM lipid concentrations increased

and 141 decreased; others were consistent. Between BM and infant plasma, 484 lipids were positively and 6 negatively associated; 85.3% of positive were triglycerides, while negative were phosphatidylglycerols (83.3%) and hexosylceramides (17.6%). Over the same period, 27% of infant lipid concentrations changed significantly, with 243 increasing and 150 decreasing.
Conclusions: Maternal lipids were relatively stable, while BM and infant lipids changed in the first 6 months postpartum. Positive associations between maternal plasma, BM, and infant plasma lipids were mostly triglycerides. Further studies focusing on interactions of the mother-milk-infant triad and lipids are needed.

OP011 / #731

FECAL AMINO ACID PROFILES IN EXTREMELY PRETERM INFANTS: EARLY-LIFE DETERMINANTS AND ASSOCIATIONS WITH LATE-ONSET SEPSIS

ORAL PRESENTATIONS SESSION 02: GROWTH, MICROBIOME AND BIG DATA

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Background and Aims: The preterm fecal microbiome and metabolome are associated with several clinical characteristics and diseases such as late-onset sepsis (LOS). However, limited knowledge exists on which early life factors modulate fecal amino acids (AAs), and how AAs are associated with disease in preterm infants. This study assessed the early-life determinants of fecal AAs and investigated AA profiles prior to clinical LOS onset to improve pathophysiological mechanistic understanding.

Methods: This multi-center study included infants (<28 weeks' gestation) with non-staphylococcal LOS, which were matched 1:1 to non-LOS controls, based on gestational and postnatal age at LOS onset (t0), probiotic use, and birth center. Fecal samples at days 7, 14, 21, and 28 from the matched controls were analyzed with targeted high-performance liquid chromatography-tandem mass-spectrometry to identify early-life determinants. Additionally, samples in the three preceding days from affected infants and controls were analyzed.

Results: In total, 40 infants providing 131 fecal samples were included. Probiotic use was associated with a difference in overall AA composition (R^2=8%, p=0.03). Additionally, full-enteral feeding was associated with increased glutamine and proline; increasing postnatal age with decreased glutamine, threonine, methionine and leucine; and cesarean delivery with increased glutamic acid and glutamine (all p<0.05). Threonine and glutamine were significantly decreased in infants with LOS, threonine achieved an area under the curve of 0.65 (95%-CI: 0.53-0.76).

Conclusions: Several clinical characteristics, including probiotic use and enteral feeding, influence fecal AA profiles. Additionally, threonine was decreased preceding LOS, suggesting that altered threonine metabolism may be linked to the underlying pathophysiology.

OP012 / #410

DEEP LEARNING–DRIVEN INTEGRATION OF NEONATAL METABOLOMICS AND SPLICE-VARIANT SIGNATURES PREDICTS EARLY GROWTH-IMPAIRMENT RISK IN PEDIATRIC INBORN ERRORS OF METABOLISM

ORAL PRESENTATIONS SESSION 02: GROWTH, MICROBIOME AND BIG DATA

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Background and Aims: Metabolic flux disruption is an indicator preceding linear-growth decline in infants with unresolved inborn errors of metabolism (IEM). Untargeted metabolomics can capture these biochemical disturbances, particularly across branched-chain amino acids (BCAA), acylcarnitines, and essential fatty acids (EFA), before anthropometric deficits appear. We aimed to use neonatal metabolomic signatures as the primary driver for early growth-impairment prediction, with deep learning–derived splice-variant signals added to strengthen mechanistic interpretation.
Methods: We analyzed 268 infants (0–6 years) with suspected IEM from two pediatric rare-disease WES/WGS cohorts and integrated their profiles with untargeted LC–MS neonatal metabolomics from the NIH Metabolomics Workbench dataset ST002750 (22 MSUD newborns, 22 controls; 1,040 dysregulated metabolites). ST002750-derived features were mapped to infant plasma metabolite Z-scores and WHO-standardized length-for-age trajectories. BCAA overload markers, short- and medium-chain acylcarnitines (C3–C5, C8), and EFA depletion indices were aggregated into pathway-level scores. A deep-learning splice-variant model provided non-coding splicing context. Penalized regression, causal forests, and targeted maximum likelihood estimation evaluated associations between integrated profiles and ≥0.8 SD LAZ decline, adjusted for age, sex, feeding route, and nutrition support.
Results: Metabolomics-derived pathway scores predicted growth deceleration with AUROC 0.827, driven by BCAA accumulation, acylcarnitine buildup, and EFA depletion. Incorporating splice-variant context increased discrimination to 0.885 and improved Net Reclassification Index by 0.18. Infants in the highest integrated-risk quartile had 2.91-fold higher odds of ≥0.8 SD LAZ decline (95% CI 1.96–4.37; $p<0.001$). Nutrition strategies aligned to metabolomic patterns achieved 31% greater 6-month catch-up growth.
Conclusions: Neonatal metabolomics robustly predicts growth impairment, with splice-variant modeling enhancing classification and precision nutrition.

OP013 / #388

POLY- AND PERFLUOROALKYL SUBSTANCES (PFAS) AFFECT METABOLOMICS IN THE FIRST 2 YEARS OF LIFE

ORAL PRESENTATIONS SESSION 02: GROWTH, MICROBIOME AND BIG DATA

Inge A. L. P. Van Beijsterveldt[1], Pernille Neve Myers[2], Irene Van Beelen[1], Bertrand Van Zelst[3], Sjoerd Van Den Berg[3], Susan Brix[4], Anita C.S. Hokken-Koelega[1], Albert Koulman[5]
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Background and Aims: PFAS are thought to have a wide range of adverse developmental effects in children. They could alter plasma lipids in infants, which could have long-term effects on body composition and metabolic profile. Exclusively breastfed (EBF) and exclusively formula fed (EFF) infants have different metabolic profiles, which could contribute to the protection against obesity from breastfeeding. However, we found that infants that were EBF had 2-3 times higher plasma PFAS levels at least until the age of 2 years. We studied the associations between plasma PFAS levels and metabolomics in children aged 3-24 months and investigated if associations differed based on early-life feeding practices.
Methods: We determined plasma levels of 5 PFAS (PFOA, PFOS, PFHxS, PFDA, PFNA) and 349 metabolites and lipids in blood collected at 3 months - 2 years in 282 healthy term-born infants (112 EBF, 73 EFF, and 97 mixed-fed) from the Sophia Pluto birth cohort. We studied the associations between PFAS levels and metabolomics using multiple regression models adjusted for confounders.
Results: Over 20% of the metabolome and lipids in plasma samples at age 2 years correlated significantly to ≥1 of the quantified PFAS. These were mostly n-3 poly-unsaturated fatty acids containing lipids that showed a correlation with totalPFOA while there was an inverse associations for these with n-6 polyunsaturated fatty acids. At 3 months, the PFAS levels and metabolomics were strongly influenced by feeding type.
Conclusions: PFAS levels are strongly associated to metabolomics in children at age 3 months and 2 years, suggesting that PFAS exposure might affect lipid metabolism in early childhood.

OP014 / #732

MULTISTRAIN PROBIOTICS IN EXTREMELY PRETERM INFANTS: FECAL TRYPTOPHAN METABOLITES AND SHORT-CHAIN FATTY ACIDS

ORAL PRESENTATIONS SESSION 02: GROWTH, MICROBIOME AND BIG DATA

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Background and Aims: The implementation of a multi-strain probiotic product has been associated with a reduction in necrotizing enterocolitis (NEC) incidence. This protective effect may be driven by changes in gut metabolomics, involving tryptophan (Trp) metabolites and short-chain fatty acids (SCFAs). This study aims to investigate fecal Trp metabolites and SCFAs in extremely preterm infants without NEC or sepsis, exposed- and unexposed to routinely administered probiotics.
Methods: Probiotic-exposed (ProPrems®) preterm infants (gestational age<28 weeks) were matched to non-exposed infants (criteria: center, gestational age, delivery mode). Fecal samples collected during week 1 to 4 postnatally were analyzed for Trp metabolites and SCFAs using liquid-chromatography coupled with quadrupole mass-spectrometry. Metabolite concentrations were compared between groups using multivariate analyses. For Trp metabolites, metabolite beta-diversity was assessed and relevant ratios were compared.
Results: In total, 118 fecal samples from 35 infants were analyzed. Trp metabolites showed considerable inter-individual variability, with probiotic exposure as the strongest contributor to beta-diversity (R^2: 5%, adj-p < 0.001). Indole-3-lactic acid (ILA), kynurenine and Trp itself were significantly higher in probiotic exposed infants, with ILA showing a 7-fold increase (**Figure 1**). When accounting for higher precursor availability, ILA remained significantly increased. For the SCFAs analysis, probiotic exposure was associated with a 3.3-fold increase in acetic acid concentrations (adj.p < 0.001).

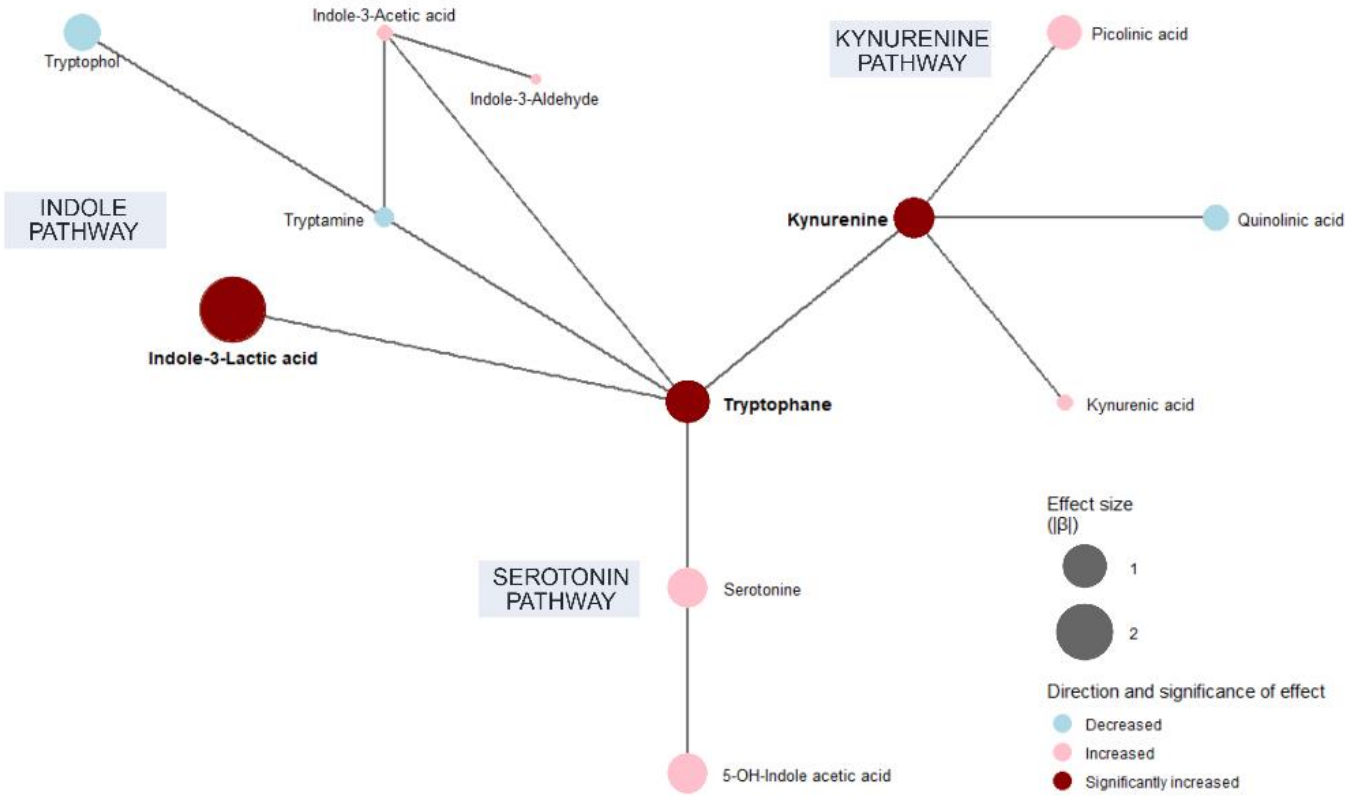

Figure 1. Network plot of probiotic-associated effects on fecal tryptophan metabolites. Nodes represent individual tryptophan metabolites within the indole, kynurenine, and serotonin pathways, connected according to established pathway relationships. Only the tryptophan metabolites with >50% of samples above the LLOQ are shown. Node size corresponds to the magnitude of the probiotic-associated effect (as determined by an adjusted linear mixed model per metabolite, adjusted for week of life, antibiotic exposure, and blocked by patient identification), while node color denotes direction and statistical significance of the association. Red indicated increased, and blue decreased metabolite concentrations in probiotic-exposed infants, with darker shades representing significant associations. Statistical significance was set as a FDR-adjusted p-value < 0.05. It shows Indole-3-Lactic acid, Tryptophan and Kynurenine are significantly increased in probiotic-exposed infants.

Conclusions: Supplementation with ProPrems® was associated with significantly altered fecal metabolic profiles, characterized by increased ILA, Trp, kynurenine and acetic acid concentrations, which have been linked to improved gut barrier function. Future studies should assess whether these metabolic changes play a role in preventing NEC.

OP015 / #370

AI-DRIVEN MODELING OF ENDOCRINE–IMMUNE–NUTRIENT AXIS INTEGRATION FOR EARLY DETECTION OF CHILDHOOD GROWTH DISORDERS: A BIG DATA STUDY

ORAL PRESENTATIONS SESSION 02: GROWTH, MICROBIOME AND BIG DATA

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Background and Aims: Growth disorders occur when endocrine maturation, immune activation, nutrient status, and microbiome function lose coordinated alignment. No analytical approach captures these multi-system interactions in children. We developed an AI-based Global Endocrine–Immune–Nutrition Integration (EINI) Model to identify early signatures of growth failure and emerging obesity using pediatric datasets.
Methods: We integrated the NHANES 1999–2018 pediatric cohort (ages 2–19 years; n=28,666), ENANI-2019 children aged 6–59 months (n=14,558), WHO Joint Malnutrition Estimates covering nearly all UN member states, two pediatric shotgun-metagenomic cohorts (Italy PRJNA794317; China CNP0004872, combined n=129), and a pediatric subset of the American Gut Project to evaluate microbiome diversity. Variables included IGF-1, IGFBP-3, TSH, vitamin D, CRP, ferritin, folate, vitamin A/E, zinc, Healthy Eating Index scores, and microbiome α-diversity. A continuous EINI Score was derived using gradient-boosted multi-modal learning and assessed with AUC and SHAP interpretability.
Results: Children in the lowest 20% EINI Score (Integration Failure) showed markedly elevated risk across datasets. In NHANES, Integration Failure predicted stunting (OR 3.92; 95% CI 3.41–4.51) and early obesity (OR 2.84; 95% CI 2.31–3.42) independent of caloric intake. In ENANI, it strongly predicted HAZ <–2 (OR 4.11; 95% CI 3.52–4.88). Microbiome diversity below the 25th percentile increased the likelihood of Integration Failure by 34%. Globally, Integration Failure aligned with national stunting (r=0.74) and overweight patterns (r=0.63). The EINI Model improved prediction of adverse growth outcomes by +18.4% AUC, surpassing nutrition-only and endocrine-only models.
Conclusions: The EINI framework quantifies endocrine–immune–nutrient axis integration to detect growth vulnerability before anthropometric decline and supports earlier, biologically targeted nutrition interventions.

OP016 / #151

IMPACT OF THE INTRODUCTION OF THE NEW GROWTH CHARTS ON PAEDIATRIC GROWTH HORMONE PRESCRIPTIONS IN FRANCE

ORAL PRESENTATIONS SESSION 02: GROWTH, MICROBIOME AND BIG DATA

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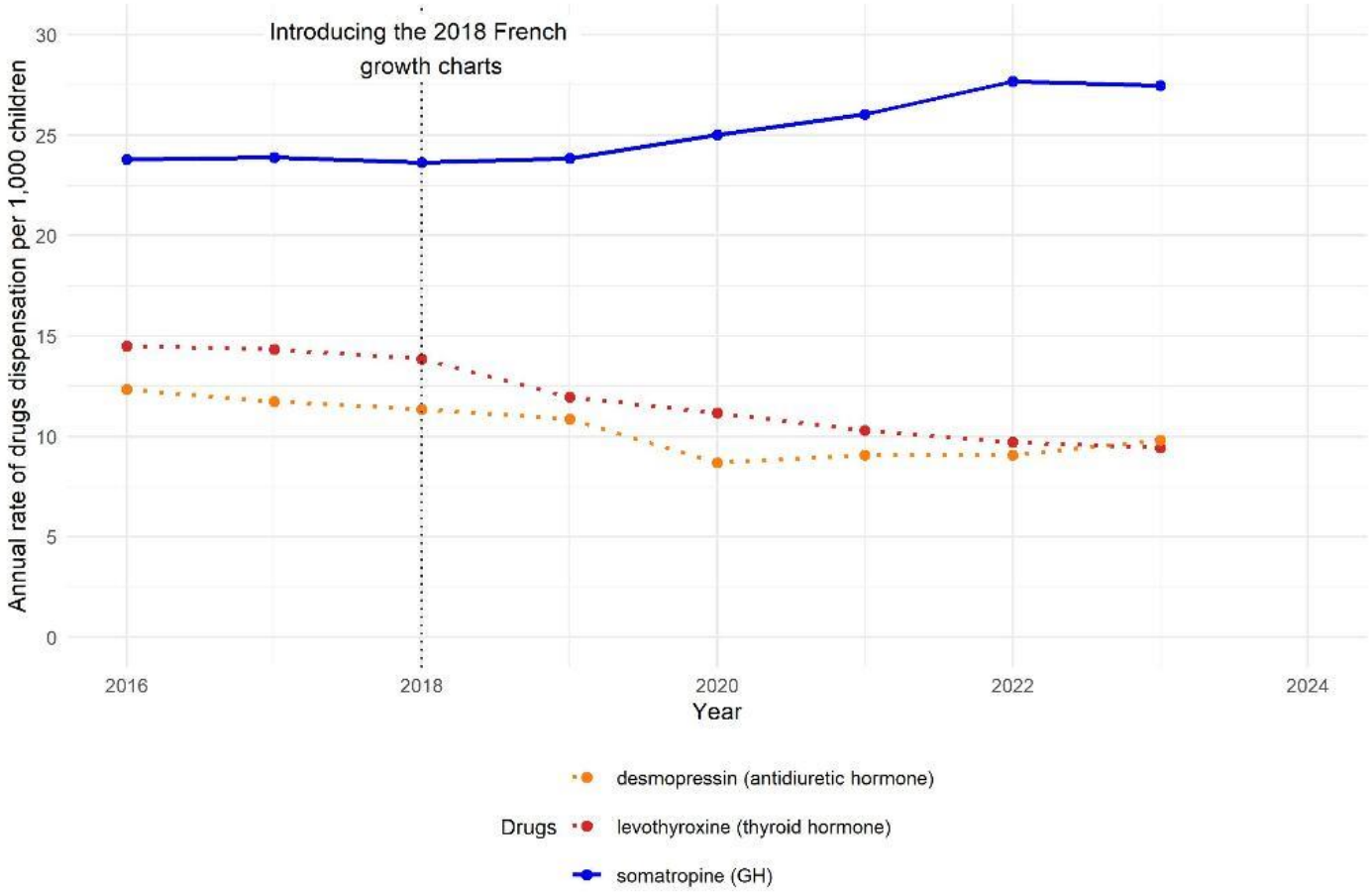
Background and Aims: Rational growth hormone (GH) prescribing is a major challenge. Two of the main indications for GH treatment are mostly based on auxological diagnostic criteria: GH deficiency in children and small for gestational age without catch-up growth. We examined whether the upward shift of the height distribution introduced by the 2018 new growth charts preceded an increase in GH prescriptions in France.
Methods: We used the Open Medic French national database of outpatient drugs dispensed in French retail pharmacies. We plotted the annual dispensation rate of GH (ATC class H01AC-somatropin and analogs), expressed as the number of packages per 1,000 living patients < 20 years old, from 2016 to 2023. We compared the mean prescription rates for GH and two negative controls (levothyroxine and desmopressin, prescribed notably for pituitary deficiency) between 2016-2017 and 2022-2023.
Results: A total of 3,261,172 GH packages were dispensed for patients < 20 years old from 2016 to 2023. The annual GH dispensation rate increased after 2019 and reached a plateau in 2022 (Figure 1). We found a significant relative increase in mean annual GH dispensation rates of 15.6% (95%CI 15.3–16.0, p<0.001) from 2016-2017 (23.8/1,000 children per year) to 2022-2023 (27.6‰). In contrast, the annual dispensation rates for levothyroxine and desmopressin decreased during the same period.



Conclusions: After the 2018 French growth charts were introduced, the annual GH dispensation rate significantly increased in France, which raises the question of the sustainability of increased GH-associated spending.

OP017 / #330

ASSOCIATION BETWEEN HEATWAVE EXPOSURE AND BMI-FOR-AGE TRAJECTORIES IN BRAZILIAN CHILDREN UNDER TWO YEARS OF AGE

ORAL PRESENTATIONS SESSION 03: NEONATAL & PREMATURITY AND INFANCY

Nathália Teixeira De Oliveira, Giovana Nigri Cursino, José Thiago Alves De Sousa, Filipe Araujo Costa, Amanda Melo De Albuquerque, Isabela Rodrigues Silva Dias, Letícia Quaresma Paolino, Dayana Rodrigues Farias
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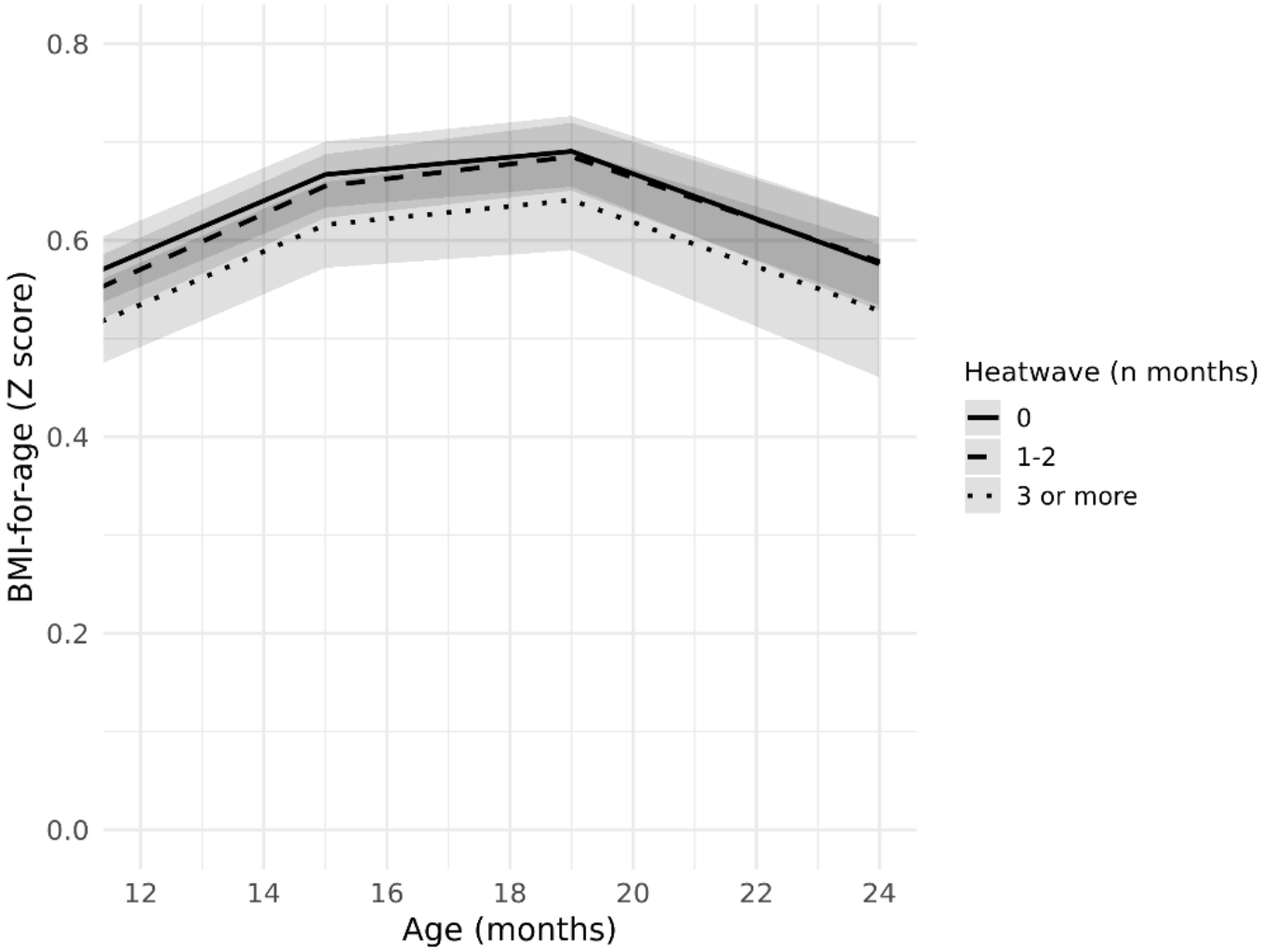
Background and Aims: Exposure to heatwaves early in life may particularly affect infant's growth and nutritional status.This study analyzes the association between heatwave exposure in the first months of life and body mass index-for-age (BMI/A) trajectories among Brazilian children under two years of age.
Methods: This longitudinal study used anthropometric microdata from the Brazilian Food and Nutrition Surveillance System (2015–2019). Daily meteorological public data was obtained from the National Institute of Meteorology in the municipality level. We included 49,412 children aged 6–23 months (166,306 observations). Heatwaves were defined as ≥3 consecutive days with mean municipal temperature > 90th percentile. Exposure was defined as the number of months (0-6) with heatwaves in the first 6 months of life. Linear mixed-effects models with random effects of intercept, slope and municipality to test the interaction term between heatwave exposure and child age in child growth.
Results: Greater heatwave exposure in early life was associated with lower BMI/A trajectories. Compared with non-exposed children, those exposed for 1 month (β = –0.0417; p = 0.002), 3 months (β = –0.0519; p = 0.004), 4 months (β = –0.0571; p = 0.016), and 6 months (β = –0.3129; p = 0.009) had significantly lower BMI/A
values.



Conclusions: Heatwave exposure between 0 and 6 months of age was associated with lower BMI/A trajectories between 6-23 months, suggesting a potential adverse impact on weight. We hypothesize that young children exposed to extreme heat and are at risk of impaired growth, but this need to be explored accounting for different possible confounders.

OP018 / #360

CONTINUOUS FEEDING FOLLOWED BY INTERMITTENT BOLUS FEEDING VERSUS INTERMITTENT BOLUS FEEDING IN ≤1250 GRAM INFANTS: A RANDOMIZED CONTROLLED TRIAL

ORAL PRESENTATIONS SESSION 03: NEONATAL & PREMATURITY AND INFANCY

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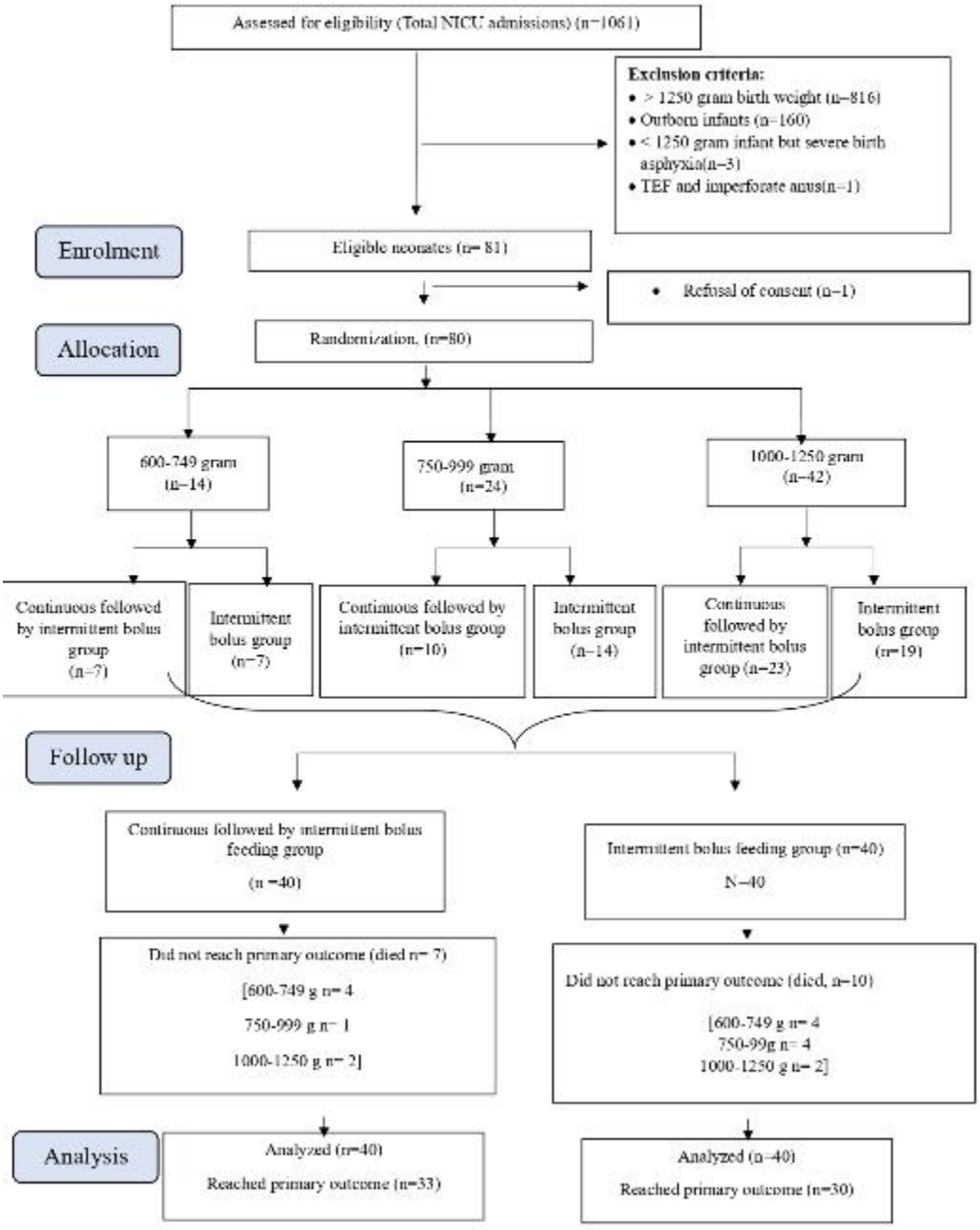
Background and Aims: Multiple trials have compared continuous versus intermittent enteral feeding for VLBW infants (<1500 g), with no clear superiority of either method. However, whether *continuous feeding may offer benefit only during the early transitional phase of feeding advancement*, before shifting to intermittent boluses, has not been evaluated. Therefore, we evaluated a hybrid feeding strategy—continuous orogastric (OG) feeding during the early advancement phase until 100 mL/kg/day, followed by intermittent bolus feeding—and compared it with exclusive intermittent OG feeding in infants ≤1250 g.
Methods: This open-label randomized controlled trial was conducted in a tertiary NICU in India. Inborn infants ≤1250 g were randomized to continuous-followed-by-intermittent OG feeding or exclusive intermittent OG feeding. The primary outcome was time to achieve full enteral feeding (150 mL/kg/day for two consecutive days). Secondary outcomes included feeding intolerance, NEC, PDA, IVH, ROP, BPD, time to regain birth weight, and mortality.

Figure 1: Flow of participants in the trial



Results: Eighty infants were randomized (40 per group). The mean gestation (28 [±2] vs. 29 [±3]weeks) and birth weight (986 [±213] vs. 984 [199]grams) were comparable. The mean (SD) time to full feeds was 13.61 ± 9.0 days in the continuous-followed-by-intermittent group and 12.27 ± 6.78 days in the intermittent group (p = 0.856). Rates of feeding intolerance, NEC, IVH, BPD, and time to regain birth weight and mortality were comparable between groups.

Conclusions: Continuous followed by intermittent bolus feeding does not offer an advantage over exclusive intermittent bolus feeding in achieving full enteral feeding among infants weighing ≤1250 g.

Both strategies appear comparable in key clinical outcomes (**Trial Registration:** CTRI/2023/12/060524).

OP019 / #334

DOES THE EVIDENCE SUPPORT THE INFLUENCE OF LOW BIRTHWEIGHT ON ADULT HEALTH AND DISEASE IN PRETERM INFANTS? A SYSTEMATIC REVIEW OF RECENT DEVELOPMENTAL ORIGIN STUDIES

ORAL PRESENTATIONS SESSION 03: NEONATAL & PREMATURITY AND INFANCY

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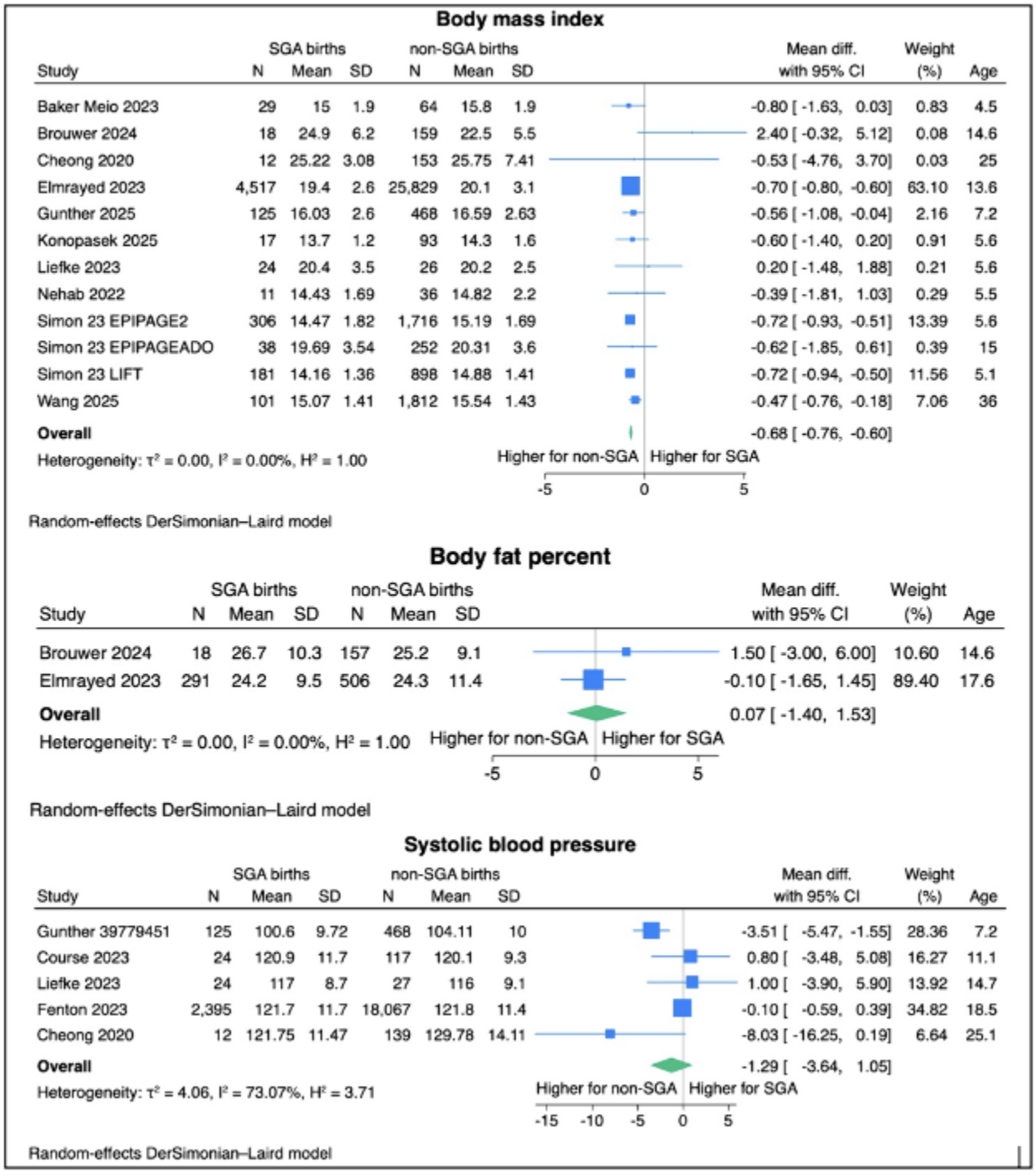
Background and Aims: The Developmental Origins of Health and Disease (DOHaD) hypothesis proposes that adverse intrauterine environments influence long-term cardiometabolic health. Findings are inconsistent and often confounded by statistical overadjustment for later body weight. We examined the association between preterm infants small for gestational age (SGA birthweight and later cardiometabolic outcomes at ages >2 years.
Methods: MEDLINE and EMBASE were searched for studies published between January 2020 and June 2025. Eligible studies compared cardiometabolic or adiposity outcomes in preterm infants born SGA versus larger birthweights. Screening and data extraction were performed in duplicate. Random-effects meta-analyses were conducted to generate pooled estimates, with subgroup analyses by adjustment for later weight/BMI.
Results: Sixteen studies met the inclusion criteria. None of the included studies adjusted for later weight or body mass index (BMI). In later life, preterm SGA infants had a lower BMI (-0.68 kg/m2, 95% CI −0.76, −0.60; 12 studies, n = 36,885, average age = 14 years), body fat (−0.02 kg, 95% CI −0.96, 0.91; 4 studies, n = 1171, average age = 18 years), and systolic blood pressure (−1.3 mmHg, 95% CI −3.6, 1.1; 5 studies, n = 21,398, average age = 18
years).

Figure: Forest plot comparisons: Later life body mass index, body fat percentage and systolic blood pressure for small for gestational age (SGA) versus non-SGA preterm infants



Conclusions: Contrary to the DOHaD hypothesis, preterm infants born SGA have lower adiposity and similar blood pressure and percent body fat in later life. The absence of increased cardiometabolic risk underscores the need for caution in restricting early nutrition among growth-restricted preterm infants and the importance of rigorous analytic approaches that avoid overadjustment bias.

OP020 / #227

USE OF EXTUBATION BUNDLE INCLUDING MODIFIED SPONTANEOUS BREATHING TRIAL (SBT) TO REDUCE THE RATE OF REINTUBATION, AMONG PRETERM NEONATES ≤ 30 WEEKS.

ORAL PRESENTATIONS SESSION 03: NEONATAL & PREMATURITY AND INFANCY

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Background and Aims: The ideal time for extubation is based on clinical and laboratory parameters assessed at the time of planned extubation. However, such parameters are not very objective, which makes extubation in NICUs a trial-and-error approach. This work was done to assess the use of extubation bundle including modified spontaneous breathing trial to reduce the rate of reintubation, among preterm neonates ≤ 30 weeks who were mechanically ventilated.
Methods: A prospective study based on the collection of data regarding preterm neonates ≤ 30 weeks gestation admitted to the NICU and subjected to mechanical ventilation and extubation. When the clinical team decides a newborn is ready for extubation based on the extubation bundle, a modified SBT is used.
Results: This study included 230 premature babies from 26-30 weeks recruited in NICU. Extubation bundle with modified SBT was able to predict success of extubation with 95% sensitivity and 90.4% Positive Predictive Value in the gestational age group 26-≤ 28 (120) and 95.3% sensitivity and 90% PPV in the gestational age group 28- ≤30 weeks (110). Extubated babies had a higher GA and weighed more at extubation, compared to babies who required re-intubation.
Conclusions: In summary, extubation bundle with modified SBT prior to elective extubation is recommended to be used in predicting successful extubation in premature babies. Guidelines for extubation among premature babies are needed in order to reduce unnecessary exposure to adverse effects of mechanical ventilation. Guidelines for extubation among premature babies are needed in order to reduce unnecessary exposure to adverse effects of mechanical ventilation

OP021 / #257

EVERY DIAPER TELLS A STORY: DAILY DIAPER AUDIT TO PREVENT LOS AND ENHANCE GROWTH IN VLBW INFANTS A QI MODEL FROM NORTHERN INDIA

ORAL PRESENTATIONS SESSION 03: NEONATAL & PREMATURITY AND INFANCY

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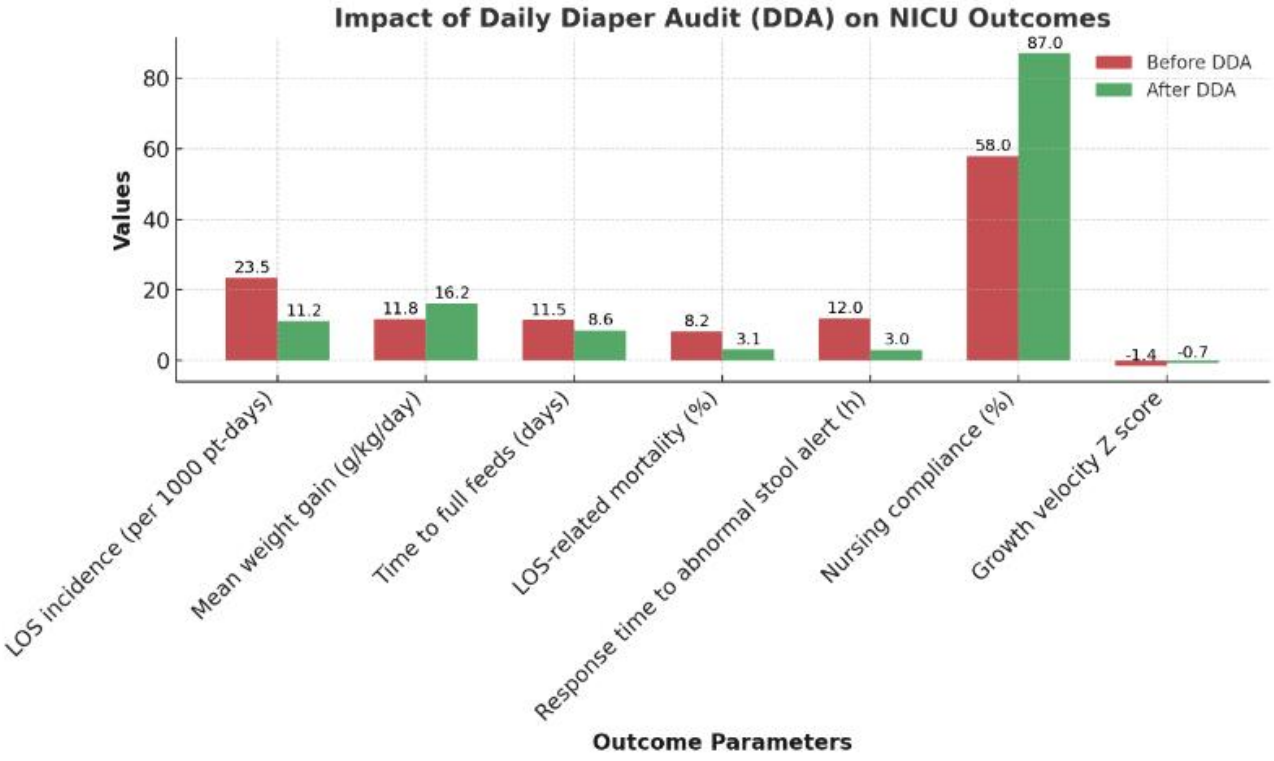
Background and Aims: Late-onset sepsis (LOS) remains a major cause of morbidity, mortality, and postnatal growth failure among very low birth weight (VLBW) infants. Most episodes originate from intestinal dysbiosis and translocation of gut pathogens across an immature mucosal barrier. Subtle stool changes frequently precede systemic illness but are rarely recorded in a structured manner. This quality-improvement (QI) initiative introduced a Daily Diaper Audit (DDA)—a nurse-driven, bedside surveillance system that transforms routine diaper checks into an early-warning tool for gut dysfunction, enabling pre-emptive clinical action to halt the sepsis cascade.
Methods: A pre–post QI study was conducted in Rural North India enrolling 98 VLBW infants.A colour-coded DDA chart captured stool frequency, colour, and consistency at each diaper change.Pre-defined red-flag patterns—no stool > 24 h, greenish-black, bloody, or foul-smelling stools—triggered immediate clinician review and feed adjustment.Sequential PDSA cycles refined compliance and feedback. Primary outcome: LOS incidence (per 1000 patient-days). Secondary outcomes: time to full feeds, growth velocity, and mortality.
Results: • LOS incidence fell by 50%• Mean weight gain rose by 5% • Time to full feeds shortened • LOS-related mortality
declined



• Median response time to abnormal stool alert reduced from 12 h → 3 h. Nursing compliance with the audit improved

Conclusions: The Daily Diaper Audit is a simple, cost-neutral innovation that converts everyday nursing observation into real-time diagnostic intelligence. By identifying stool-based indicators of gut dysbiosis before systemic illness emerges, DDA disrupts the LOS pathway, lowers infection burden, and supports optimal nutrition and growth.This nurse-led model is scalable, sustainable, and adaptable for resource-limited NICUs, aligning seamlessly with WHO Quality-of-Care and global newborn-growth targets.

OP022 / #776

LIFESTYLE AND EATING BEHAVIOR OUTCOMES IN EXTREMELY PRETERM CHILDREN AT CORRECTED AGE 2: RESULTS FROM THE GENERATION P STUDY

ORAL PRESENTATIONS SESSION 03: NEONATAL & PREMATURITY AND INFANCY

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Background and Aims: Extremely preterm (EP) children are at increased risk for long-term challenges in eating behaviors and lifestyle-related morbidity. This sub-study assesses early lifestyle and eating behaviors at 2-years' corrected age.

Methods: Parents of EP-born children completed two validated health questionnaires at 2-years' corrected age: FLY-kids, a lifestyle screening tool assessing adherence to age-specific recommendations across nine lifestyle domains, and the Montreal Children's Hospital Feeding Scale (MCHFS), which evaluates feeding difficulties. Lifestyle results were compared to an existing Dutch reference population of 2-year-olds (Krijger *et al.* 2023).

Results: Of 239 eligible EP children, 176 (74%) were enrolled in the study of whom 115 (65%) completed the questionnaires. Compared with the Dutch reference population (n=73), EP children had significantly more unmet lifestyle recommendations (3.29 vs. 3.92 items, respectively, p=0.01). Interestingly, a higher proportion of EP children had sleep durations exceeding the recommended range (p<0.001). Other lifestyle items were similar. In both populations, >30% of children did not meet recommendations for seven of nine items (**Figure 1**). Feeding difficulties were reported in 20% of EP children according to the MCHFS, of whom 17% still relied on tube feeding. A higher MCHFS score was associated with a lower BMI (p=0.026).

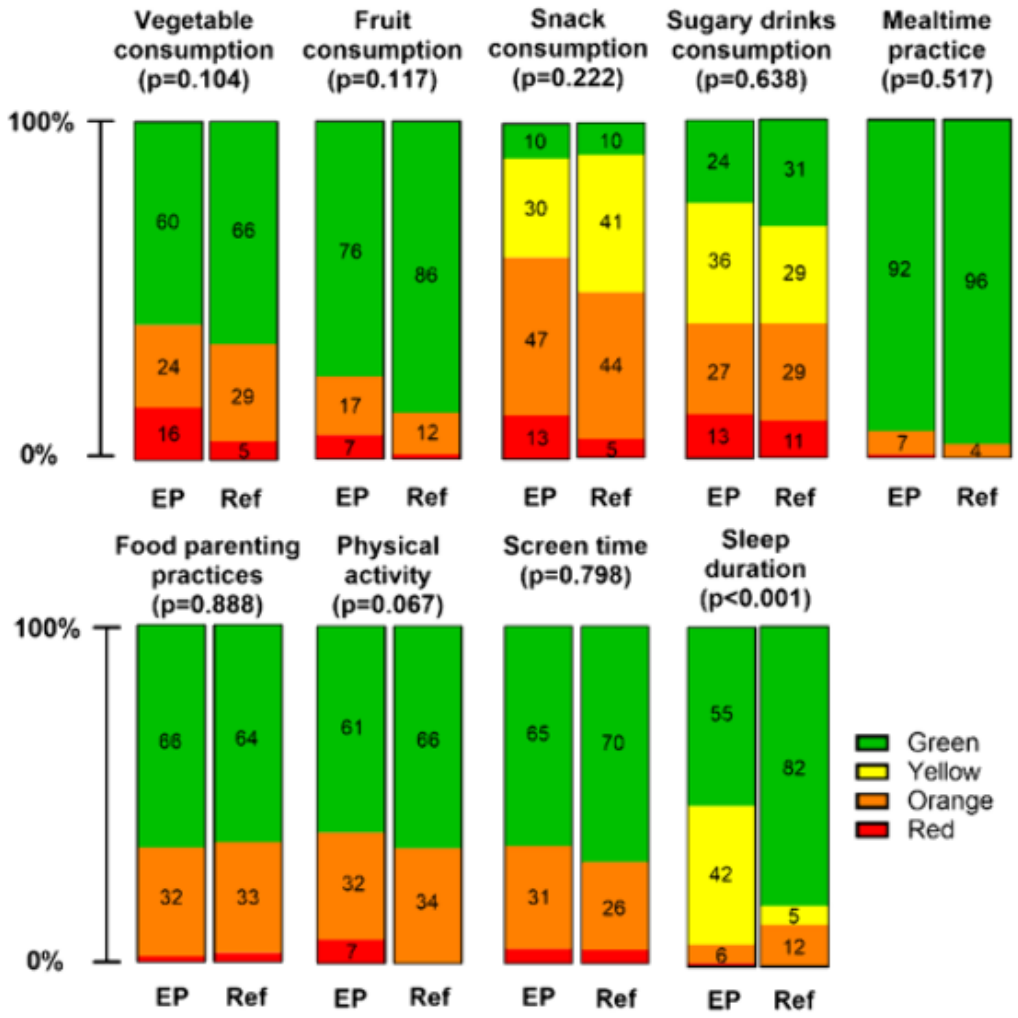

Figure 1. Comparison of the FLY-Kids outcomes across nine lifestyle items in the extremely preterm (EP) and reference (Ref) population. The FLY-kids is a lifestyle screening tool for children between the ages of 1 and 3 years. Parental answers across nine lifestyle items are coded by color from green, indicating that national lifestyle recommendations are met, to yellow, orange, and red, which indicate progressively lower levels of adherence. For each of the nine lifestyle items, the figure displays the proportions of children falling within each scoring category (green, yellow, orange, red) allowing for assessment of similarities and differences between the two cohorts. A larger proportion of EP children (n=115) sleep longer compared to the reference population (n=73): 42% sleeps 14 hours or more per 24 hours as represented by the yellow category ($p<0.001$, Chi-Square test). Lifestyle patterns are similar across the other eight items. A p-value <0.05 was considered significant.

Conclusions: With the exception of sleep duration, lifestyle domains in extremely preterm infants resemble those of the general population. However, adherence to the lifestyle recommendations in both populations remains suboptimal. Furthermore, eating difficulties may persist beyond infancy potentially influencing long-term dietary behaviors. These findings highlight the need for early, structured lifestyle and feeding interventions in this high-risk population.

OP023 / #679

MODELLING CHILDHOOD GROWTH AND DEVELOPMENT: DIETARY IMPACTS OF A NOVEL FERMENTED MILK INGREDIENT ALONE AND IN COMBINATION WITH COLOSTRUM PROTEIN IN A PIG MODEL

ORAL PRESENTATIONS SESSION 03: NEONATAL & PREMATURITY AND INFANCY

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Background and Aims: Steady and continuous weight gain is a key marker of infant and child development. Nutrient malabsorption, allergies, intolerances, picky eating, and sensory aversions, can impair growth. In the absence of breastfeeding, or during complementary feeding, dairy ingredients are commonly used for their nutritional quality, digestibility, and abundant health-promoting compounds. This study examined a proprietary fermented milk ingredient (FMI), produced from skimmed milk using *Bifidobacterium spp*. and *Lactobacillus spp.* , to enhance milk functional properties. To evaluate the effects of FMI and other dairy ingredients on growth and development, an *in vivo* model was required. Pigs serve as a preclinical model for human nutrition due to physiological similarities in digestive and immune development. Their weaning period mirrors that of children, with reduced growth followed by catch-up, providing a relevant window for nutritional intervention.
Methods: Forty-two weaned piglets (28 days old; n=14/group) were assigned to one of three diets for 21 days: (1) a control diet with 10% plant protein; (2) a diet containing 5% FMI; or (3) a diet containing 5% FMI plus 5% colostrum protein (MIX). Growth performance and blood biomarkers were measured.
Results: All groups gained weight normally, and although back-fat depth did not differ, significant differences were detected in feed-intake trajectories, with FMI and MIX groups adapting differently from control. Haematological analyses revealed expected age-related shifts, while pigs receiving the MIX diet displayed improved blood health indicators.
Conclusions: Overall, the model proved effective for studying early-life nutrition, and both FMI-based diets supported normal growth, with the MIX diet providing additional benefits.

OP024 / #622

MILK FAT INTAKE, ADIPOSITY AND OBESITY IN CANADIAN CHILDREN

ORAL PRESENTATIONS SESSION 04: CHILDHOOD & ADOLESCENCE

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Background and Aims: Guidelines in North America and other countries recommend that children switch from whole (3.25%) to reduced-fat milk after age two to limit saturated fat intake and prevent obesity, despite these recommendations being derived primarily from adult studies. We examined the associations of cow's milk fat content at age five and obesity status among five-and eight-year-old Canadian children.
Methods: We analyzed data from the Canadian CHILD study, a prospective cohort. At age five, caregivers reported the fat content of cow's milk consumed (skim(0%), 1%, 2%, 3.25%). Anthropometric measures at ages five (N=2043) and eight-years (N=1574) included body-mass-index and waist-to-height ratio z-scores; and at age eight, fat mass percentage, and obesity (defined using WHO criteria and the Lancet Commission). Multivariable linear and logistic regression models were adjusted for sociodemographic, lifestyle, and dietary factors.
Results: At age five, most children consumed 2% (48.9%) or 3.25% (23.9%) fat from cow's milk. Compared with skimmed cow's milk, whole (3.25%) cow's milk consumption was associated with lower BMIz-score at age five (β=−0.34;95%CI: −0.54, −0.13) and lower odds of living with obesity (OR=0.22;95%CI: 0.07, 0.67). Whole cow's milk consumption at five was also inversely associated with BMIz-score (β=−0.42;95%CI: −0.72, −0.11), waist-to-height ratio z-score (β=−0.35;95%CI: −0.63, −0.07), fat mass (β=−1.58; 95%CI: −3.10, −0.06), obesity (OR=0.31;95% CI: 0.12, 0.80), and preclinical obesity (OR=0.25;95%CI: 0.09, 0.70) at age eight.
Conclusions: Whole cow's milk consumption at age five was associated with lower adiposity and obesity indicators in middle childhood. These findings challenge current recommendations to limit milk-fat in children and may inform future dietary guidelines.

OP025 / #375

FAMILY-SUPERVISED HOME HOSPITALIZATION IN EXTREME-SEVERITY ANOREXIA NERVOSA: FIVE-YEAR EXPERIENCE

ORAL PRESENTATIONS SESSION 04: CHILDHOOD & ADOLESCENCE

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Background and Aims: Background Hospital admission is usually recommended for extreme-severity Anorexia Nervosa (AN) (BMI <15 kg/m^2). However, when clinical stability and strong family involvement are present, Family-Supervised Home Hospitalization (HSHF) may provide an intensive care model equivalent to inpatient management. This study aims to describe the implementation and outcomes of HSHF in an Adolescent Medicine Unit over five years.
Methods: A retrospective review was conducted of all patients treated through HSHF between January 2020 and December 2024. Eligible patients presented restrictive, non-chronic AN and BMI <15 kg/m^2 at the initial visit. The HSHF protocol reproduced inpatient standards, including initial restriction, a progressively hypercaloric diet, psychotropic medication, and combined medical-psychological follow-up. Parents acted as primary caregivers. Patients were assessed in person 2–3 times per week, with continuous telephone support for families.
Results: Twenty-one patients (20 females), aged 10 to 26 years, were included. All showed sustained BMI increases during HSHF, with a mean duration of 3–5 weeks. A reduction in anorexic ideation and improvement in psychiatric comorbidities were observed, comparable to outcomes reported in inpatient care. Patients achieved earlier return to academic or work activities. Strong family involvement proved essential for adherence and clinical stability throughout the intervention.
Conclusions: Over five years, HSHF demonstrated favourable clinical outcomes and appears to be a viable therapeutic option for clinically stable adolescents with adequate family support. This model offers advantages such as reduced healthcare costs, improved patient comfort, and maintenance of treatment efficacy comparable to inpatient management, supporting its consideration within care pathways for adolescent AN.

OP026 / #701

ORAL AND DENTAL STATUS IN CHILDREN WITH INTESTINAL FAILURE: A CROSS-SECTIONAL STUDY

ORAL PRESENTATIONS SESSION 04: CHILDHOOD & ADOLESCENCE

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Background and Aims: Children with intestinal failure (IF) requiring long-term parenteral nutrition (PN), face feeding challenges, yet their oral and dental health remains underexplored. We aimed to assess oral and dental health in pediatric IF.

Methods: A cross-sectional study was conducted in 2024 at a tertiary pediatric IF and Rehabilitation Clinic. Collected were demographics, IF etiology, PN parameters, and feeding assessments. A pediatric dentist evaluated oral hygiene habits and dental status, including plaque index, gingival index, dental calculus, caries status, and enamel hypoplasia (using dental examination and intra-oral scans).

Results: The study included 22 patients (45.5% females, median age 7.15 [IQR 4.93-12.4] years). IF etiologies included short-bowel syndrome (50%), congenital enteropathies (27.3%), and dysmotility (22.7%). Most patients (72.7%) required daily PN, with a median infusion duration of 10.5 hours/day. Restricted oral intake was noted in 11/22 (50%) patients: nine consumed bite-sized solids, one followed a liquid-only diet, and one had severe food aversion. Only 18.2% brushed their teeth twice daily.
Dental calculus was present in 14/22 (63.6%) patients. Moreover, patients had significantly higher plaque, gingival, and calculus scores than pediatric reference values ($p<0.01$ for all). No significant association was found with restricted eating or PN parameters. Dental caries affected 4/22 (18.2%) patients, and enamel hypoplasia was observed in 8/12 (66.7%) children over six years, often presenting with severe disruption involving all four molars.

Conclusions: Children with IF frequently exhibit poor oral hygiene and gingival inflammation. These findings emphasize the importance of integrated nutritional and dental care in managing pediatric patients with IF.

OP027 / #557

TRENDS IN PREVALENCE OF FEEDING PROBLEMS IN THREE-YEAR-OLD CHILDREN: A POPULATION-BASED COHORT STUDY IN NORTHERN SWEDEN

ORAL PRESENTATIONS SESSION 04: CHILDHOOD & ADOLESCENCE

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Background and Aims: Feeding problems are common in early childhood, ranging from mild selectivity to severe disorders such as Pediatric Feeding Disorder (PFD) and Avoidant Restrictive Food Intake Disorder (ARFID). A clinical study in northern Sweden, showed a four-fold increase in PFD among children under five in the last decade. This study investigates trends in prevalence of feeding problems in population-based cohort and explores associations with medical comorbidities.
Methods: Data were obtained from NorthPop, a population-based birth cohort. Annual prevalence of parent-reported feeding problems in three years old children was calculated between 2019 and 2024 (N=2729). Feeding problems were defined as a score of 45 or higher on the Montreal Children's Hospital Feeding Scale. Medical comorbidities (prematurity, neurological, neuropsychiatric, gastrointestinal, malignancy, cardiac, and respiratory conditions) will be identified using diagnostic codes from the National Patient Register. Subgroup analysis will be presented at the conference.
Results: Annual prevalence declined from 12.8% in 2019 to 9.2% in 2024 (Figure 1). In total, 288 of 2729 children (10.6%) were reported to have feeding problems during this period. Logistic regression showed a yearly decrease in the odds of having feeding problems of approximately 7.5% (B = -0.08, SE = 0.04, p = 0.06), with an odds ratio of 0.93 (95% CI: 0.85–
1.0).

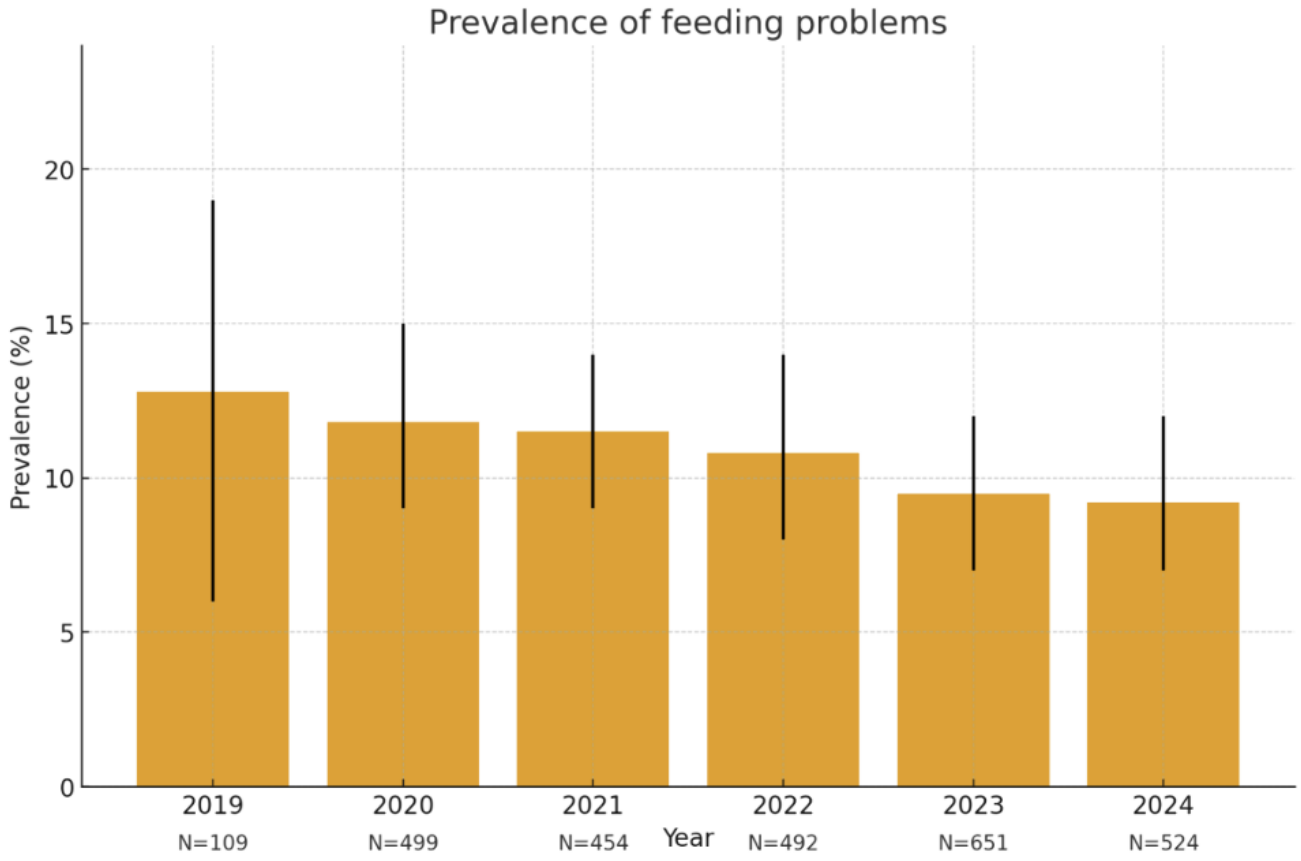

Figure 1. Annual prevalence of feeding problems among children (N = 2,729) in northern Sweden from 2019 to 2024, presented as percentages with 95% confidence intervals.

Conclusions: Parent-reported feeding problems of potentially clinical relevance affect 10.6% of three-year-old children in Northern Sweden. The prevalence trend suggests a decline, in contrast to the rise observed in the region's clinical population. This may reflect improved recognition and the recent introduction of PFD and ARFID diagnoses.

OP028 / #190

EFFECT OF ORAL NUTRITIONAL SUPPLEMENTS AND OTHER NUTRITIONAL INTERVENTIONS ON LINEAR GROWTH DURING PUBERTY: A RAPID SYSTEMATIC REVIEW

ORAL PRESENTATIONS SESSION 04: CHILDHOOD & ADOLESCENCE

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Background and Aims: 17% to 23% of adult height is gained during puberty, particularly during growth
spurt. Genetic and hormonal factors drive growth through this stage, but nutritional insufficiency, regardless of the cause, may impair peak height velocity and lean mass development. This rapid systematic review aimed to evaluate whether oral nutritional supplements (ONS), food-based strategies, or micronutrient interventions improve height-related outcomes in adolescents aged 10–19 years compared to standard diet or placebo.
Methods: Following PRISMA 2020 guidelines, a rapid systematic review was registered in OSF. Searches were conducted in PubMed, Scopus, Cochrane Library, and Embase up to August 2025. Eligible studies were clinical trials or quasi-experimental designs assessing nutritional interventions in adolescents. Studies involving enteral/parenteral nutrition, pharmacologic treatments, or chronic disease populations were excluded. Data were extracted and synthesized narratively due to heterogeneity.
Results: Eight studies (n ≈ 2,300; 6–14 months duration) met inclusion criteria. ONS trials showed consistent gains in weight-SDS (+0.3–0.5), BMI-SDS (+0.4–0.5), lean mass (+2–4 kg), and modest height-SDS improvements (+0.1–0.3). Effects were dose-dependent and stronger in undernourished adolescents. Food-based interventions (e.g., whole eggs) significantly increased height (+6.9 cm vs. +3.4 cm). Micronutrient-only trials showed smaller, context-specific growth effects.
Conclusions: Based on available information, complete and balanced ONS and food-based strategies effectively support adolescent growth. Sustained, well-formulated interventions tailored to pubertal needs offer a promising approach to improve height-related outcomes. However, there is a notorious paucity of papers studying puberty, which calls for more studies to improve understanding of nutrition during this life stage.

OP029 / #683

IMPACT OF EXERCISE TYPE, INTENSITY, AND DURATION ON GROWTH, IGF-1, BMI, BODY COMPOSITION, AND BONE HEALTH IN CHILDREN AND ADOLESCENTS

ORAL PRESENTATIONS SESSION 04: CHILDHOOD & ADOLESCENCE

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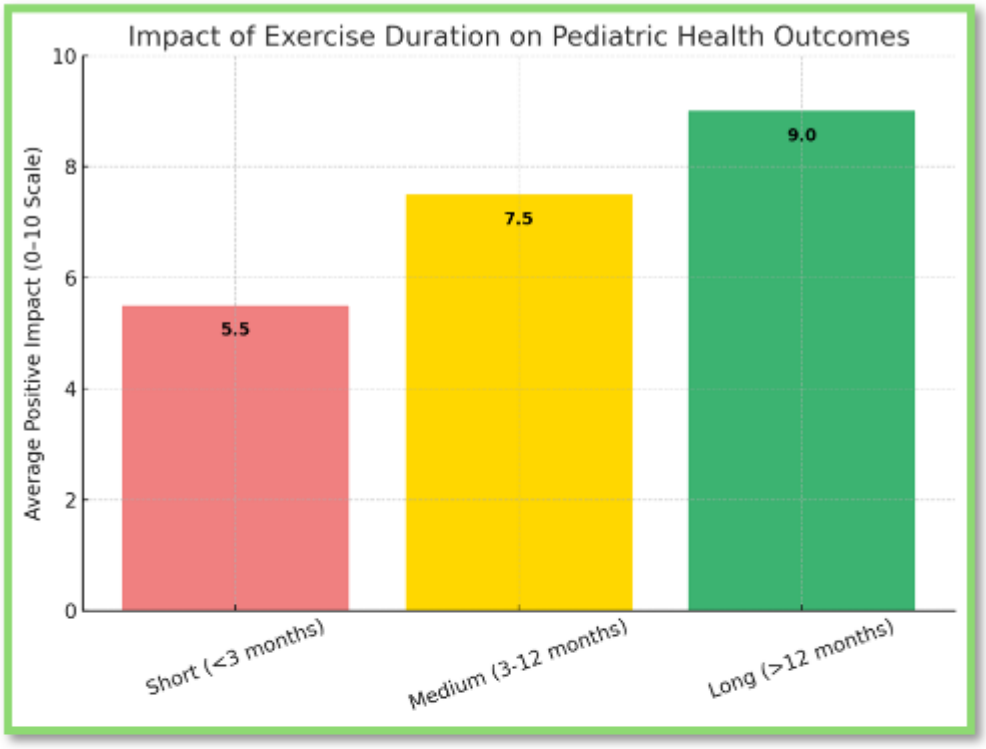
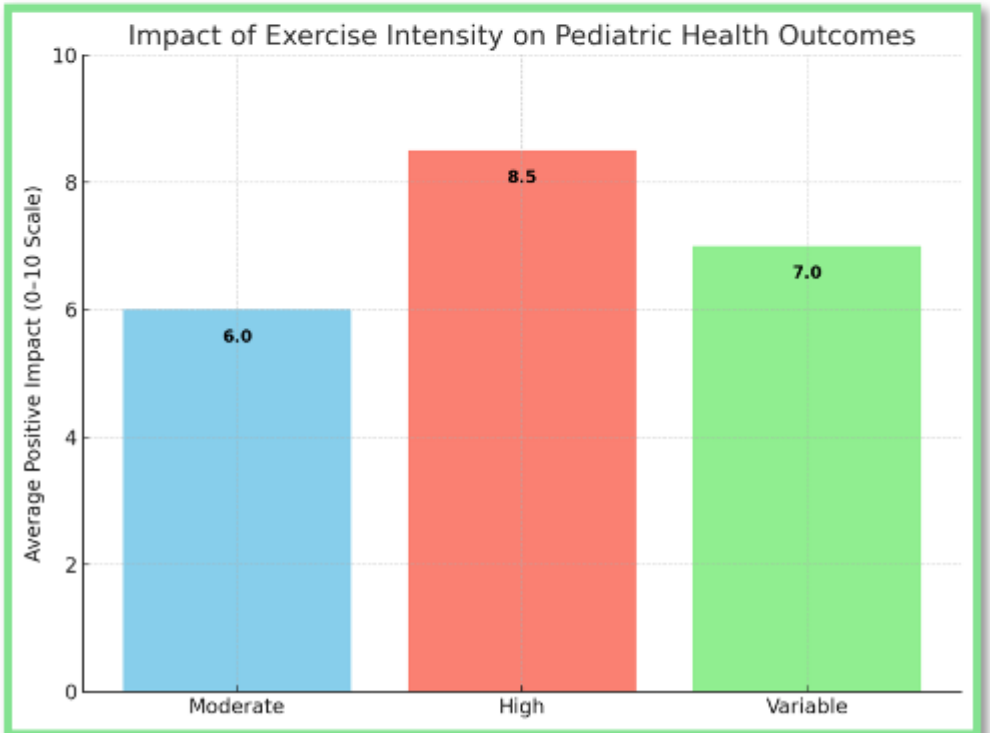
Background and Aims: Exercise plays a critical role in the physical development of children and adolescents, affecting linear growth, hormonal balance (especially IGF1), BMI, body composition, and bone mineral density (BMD). Understanding how specific exercise modalities influence these outcomes is essential for guiding pediatric health interventions. **Aim:**
To systematically review and synthesize evidence on the effects of exercise on growth, IGF-1 levels, BMI, body composition, and bone health in children and adolescents, with comparisons based on exercise type, intensity, and duration.
Methods: A systematic literature search,studies between(2000 -2024) identified randomized controlled trials, cohort studies, and meta-analyses examining exercise interventions in youth. Eligible studies reported anthropometric, hormonal, or skeletal outcomes and were categorized according to exercise type (aerobic, resistance, plyometric, high-impact), intensity (low, moderate, high), and duration (short <3 months, medium 3–12 months, long >12 months).
Results: Exercise interventions lasting >12weeks improve body composition and skeletal health. High-impact,load-bearing, and plyometric exercises effectively increase bone mineral density (BMD), especially when started during prepubertal or early pubertal stages. Aerobic, combined aerobic-resistance training significantly reduce BMI& improve fat-free mass in obese adolescents. High-intensity interval training(HIIT)&progressive resistance training(PRT)offer greater benefits for cardiometabolic fitness and lean mass compared to moderate-intensity continuous exercise.
The impact of exercise on IGF-1 varies:short-term training in prepubertal boys lowering IGF-1&IGFBP-3 levels, while longer/higher-intensity interventions typically stabilize or enhance IGF-1 secretion.
There is no evidence that exercise adversely affects linear growth:instead, mechanical loading promotes musculoskeletal development without hindering height growth.
Conclusions: Exercise positively influences skeletal, metabolic, and hormonal development. High-intensity, load-bearing, and sustained over time yield





most robust pediatric health benefits.

OP030 / #533

MATERNAL DIET MATTERS: PRENATAL ULTRA-PROCESSED FOOD EXPOSURE AND ITS EFFECTS ON NEURODEVELOPMENT AND BEHAVIOUR

ORAL PRESENTATIONS SESSION 04: CHILDHOOD & ADOLESCENCE

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Background and Aims: Maternal consumption of ultra-processed foods (UPFs) during pregnancy has been linked to adverse neurodevelopmental outcomes in offspring, nonetheless, the underlying biological mechanisms remain unclear. We aimed to investigate whether alterations in neonatal white matter (WM) microstructure may mediate these effects, focusing on potential early-life preventive implications.
Methods: A subsample of 43 mother-child pairs from a large cohort (n=1080) with prenatal dietary data, neonatal MRI-diffusion tensor imaging (DTI), and neurodevelopmental follow-up at 18 months was analysed. Maternal UPF intake was assessed via a food-frequency questionnaire. WM microstructure was evaluated using DTI tractography, and early behavioural outcomes were measured with the Child Behaviour Checklist. Associations between UPF consumption, WM metrics, and behavioral impairments were tested using permutation regression analyses in a sequential manner.
Results: Higher prenatal UPF intake was associated with self-regulation deficits at 18 months, including oppositional behaviours, attention problems, and ADHD-related symptoms. UPF exposure was also linked to increased fractional anisotropy and reduced radial and mean diffusivity in the forceps minor, right superior longitudinal fasciculus and right cingulum bundle. WM changes were further associated with the observed behavioural impairments, underlying a potential pathway linking UPF exposure to self-regulation deficits.
Conclusions: These findings suggest that maternal UPF consumption may influence early neurodevelopment through alterations in WM microstructure, highlighting a modifiable nutritional factor with potential for early-life preventive interventions. Our results underscore the importance of maternal diet during pregnancy as a target to optimize neurodevelopment and prevent behavioural impairments in infancy.

OP031 / #277

IMPACT OF ORAL NUTRITIONAL SUPPLEMENTATION ON EATING BEHAVIOUR AND APPETITE HORMONES IN MALNUTRITION-AT-RISK AND MALNOURISHED CHILDREN: MARVEL STUDY, A RANDOMIZED CONTROLLED TRIAL

ORAL PRESENTATIONS SESSION 05: MALNUTRITION AND CLINICAL NUTRITION

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Background and Aims: Undernutrition in early childhood may arise from inadequate intake and disturbances in appetite regulation, leading to poor eating behaviours. This study aimed to assess the effects of oral nutritional supplementation (ONS) on eating behaviour and appetite hormones in malnutrition-at-risk and malnourished children.
Methods: Children aged 1-6 years with weight-for-height z-scores between -1 and -3 SD (WHO standards) were randomized to receive either dietary counselling (DC) alone or DC plus ONS(1 kcal/mL,420 mL/day) for 3 months. Eating behaviours were evaluated using the validated Thai version of Children's Eating Behaviour Questionnaire (CEBQ). Serum ghrelin, leptin, peptide YY (PYY), and insulin were measured by Luminex® at baseline and post-intervention.
Results: A total of 159 children (78 DC, 81 ONS) with mean(95%CI) of 3.5(3.15–3.90) and 3.49(3.10–3.90) years years completed the 3-month study. At baseline, no significant differences were observed in CEBQ subscale scores between groups. After 3 months, improvements in eating behaviour were more pronounced in the ONS group, with lower Slowness in Eating (SE) and higher Enjoyment of Food (EF) scores compared with the DC group [mean(95%CI): SE 3.14(2.96–3.33) vs.3.40(3.23–3.56), p 0.049; EF 3.26(3.10–3.42) vs.3.00(2.84–3.16), p 0.025]. PYY and insulin significantly increased in the ONS group, while only PYY increased in the DC group. Baseline ghrelin was inversely correlated with Desire to Drink (r -0.16,p 0.048) and Slowness in Eating (r -0.18,p 0.029).

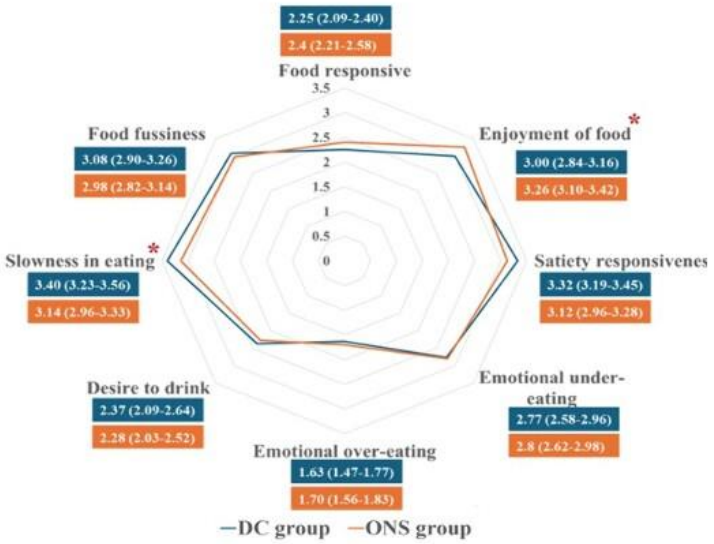

Figure 1. Comparison of Children's Eating Behaviour Questionnaire (CEBQ) subscale scores between the dietary counselling group (DC group, dark green line) and the dietary counselling plus ONS group (ONS group, orange line) at 3 months post-intervention. Values are presented as mean (95% CI), and differences in means were tested using independent-sample t-tests. *Indicates $p < 0.05$.

Conclusions: In addition to DC, ONS may improve eating behaviours in undernourished children during recovery. The contributions of appetite hormones in these improvements require further investigation. TCTR 20220908004

OP032 / #331

EFFECTS OF MEDITERRANEAN DIET OR STRESS REDUCTION INTERVENTIONS DURING PREGNANCY FOR THE PREVENTION OF SGA NEWBORNS ACCORDING TO PRE-PREGNANCY BMI. THE IMPACT BCN TRIAL.

ORAL PRESENTATIONS SESSION 05: MALNUTRITION AND CLINICAL NUTRITION

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Background and Aims: Fetal growth is influenced by maternal nutrition and stress, additionally may be modulated by pre-pregnancy Body Mass Index (BMI). To evaluate the effect of Mediterranean diet (MedDiet) or Mindfulness-based Stress Reduction (MBSR) intervention on the risk of small-for-gestational age (SGA) newborns in high-risk pregnancies, stratified by pre-pregnancy BMI.
Methods: In a randomized clinical trial, 1221 pregnant women at high-risk for SGA were randomly allocated at 19-23 weeks' gestation to a MedDiet intervention, a MBSR program or a non-intervention control. The MedDiet group (n=407) received monthly individual and group educational sessions, and free extra-virgin olive oil and walnuts. The MBSR group (n=407) completed an 8-week pregnancy-adapted MBSR program with weekly 2.5-hour and one full-day sessions. The main outcome was SGA prevalence (birthweight <10th centile). This sub-analysis examined intervention effects according to pre-pregnancy BMI: normal BMI <30, obesity BMI >30.
Results: Among 1184 participants considered for the intention-to-treat-analysis, (n=1043, 88.1%) had normal BMI. In non-obese women, SGA occurred in 81 (22.8%) in the non-intervention, compared to 47 (13.6%) in the MedDiet group (OR 0.53, 95% CI 0.36-0.79), and 57 (16.6%) in the MBSR group (OR 0.67, 95% CI 0.46-0.98). Among women with obesity (n=141, 11.9%), SGA rates were similar across groups: Control (n=7, 15.2%), MedDiet (n=8, 17.0%; OR 1.14, 95% CI 0.38-3.46) and, the MBSR group (n=4, 8.3%; OR 0.51 95% CI 0.14-1.86).
Conclusions: Structured life-style interventions during pregnancy based on MedDiet or MBSR program reduce SGA newborns in women with normal pre-pregnancy BMI. However, these effects were not observed in women with obesity.

OP033 / #447

COMPARING NUTRITIONAL INTAKE WITH RECOMMENDATIONS AND EVALUATING ITS EFFECT ON SPORTS PERFORMANCE IN MALE ADOLESCENT SOCCER PLAYERS: A NESTED CROSS-SECTIONAL STUDY

ORAL PRESENTATIONS SESSION 05: MALNUTRITION AND CLINICAL NUTRITION

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Background and Aims: Adolescent soccer players have high nutritional demands due to growth and training requirements, yet data and performance links are limited. This study aimed to assess whether players meet recommendations for energy, macronutrients, and key micronutrients, to evaluate energy availability (EA), and to examine associations between nutrient intake and performance.
Methods: A cross-sectional study included 54 male players aged 12–15 years from three professional soccer clubs. Three-day food diaries were completed and reviewed by a dietitian. Intakes were compared with DRIs and sports nutrition guidelines. Performance tests included 10 and 20 m sprints, agility, vertical jump, and Yo-Yo intermittent recovery test. Nutrient adequacy was evaluated using one-sample t-tests or Wilcoxon signed-rank tests, as appropriate. Correlations and regressions examined associations with performance.
Results: Mean energy intake was 1942.6 ± 415 kcal/day, translating to 632 ± 571 kcal below requirements. EA was 24.7 ± 12.4 kcal/kg FFM/day, lower than the recommended 45 ($p < 0.001$). Mean carbohydrate intake was insufficient at 4.8 g/kg/day, ($p < 0.05$) with only 24% meeting targets. Protein intake (2.03 g/kg/day) met recommendations, while 52% of participants exceeded 10% saturated fat. The intakes of calcium, vitamin D, vitamin E, folate, and magnesium were below recommendations, while iron and vitamin B12 intakes were adequate. Higher iron and magnesium intakes were associated with greater jump height, and iron, magnesium, calcium, and folate with improved agility ($p < 0.05$).
Conclusions: Adolescent soccer players show insufficient energy, carbohydrate, and micronutrient intakes, potentially impairing performance. Individualized nutrition support is recommended.

OP034 / #513

MATERNAL LIFESTYLE INTERVENTIONS DURING PREGNANCY MODULATE INFANT GUT MICROBIOTA: THE IMPACT BCN TRIAL

ORAL PRESENTATIONS SESSION 05: MALNUTRITION AND CLINICAL NUTRITION

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Background and Aims: To assess whether Mediterranean diet (MD) or Mindfulness-Based Stress Reduction (MBSR) interventions during pregnancy influence infant gut microbiota in the first months of life.
Methods: In the IMPACT BCN randomized clinical trial pregnant women at 19-23 weeks were randomized to MD, MBSR or usual care. The MD group received monthly educational sessions, extra-virgin olive oil and walnuts. The MBSR group underwent an 8-week program adapted for pregnancy. Infant fecal samples at 1-3 months were collected from MD (n=21), MBSR (n=25), and usual-care (n=14) groups. Microbiota was profiled by quantitative PCR (qPCR) targeting key taxa and 16S rRNA gene sequencing. Diversity, prevalence, and compositional changes were analyzed with multivariate models.
Results: qPCR showed reduced prevalence of *Enterobacteriaceae* in the MD group (p=0.009) and lower prevalence of *Bacteroidetes* spp. in the MBSR group (p=0.043) compared with usual care. 16S rRNA sequencing confirmed high interindividual variability but revealed lower microbial richness in infants from the MBSR group compared with usual care (p=0.035), with a similar non-significant trend in the MD group. Overall beta-diversity did not differ among groups (p=0.553). Compositional analysis showed that infants of MD mothers showed reduced *Escherichia/Shigella* and *Parabacteroides*. Independently of interventions, maternal factors shaped infant microbiota: high adherence to MD was associated with lower microbial diversity and a trend toward higher *Staphylococcus*, while high maternal stress was linked to enrichment in *Proteobacteria* and *Enterobacterales*, with reduced *Bifidobacterium*.
Conclusions: Maternal dietary adherence and perceived stress during pregnancy independently influenced infant microbial diversity and composition.

OP035 / #293

BARIATRIC SURGERY IN ADOLESCENTS WITH OBESITY IN ISRAEL- REAL WORLD DATA

ORAL PRESENTATIONS SESSION 05: MALNUTRITION AND CLINICAL NUTRITION

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Background and Aims: Adolescent obesity is a growing global health concern, associated with serious metabolic, cardiovascular, and psychosocial complications. Lifestyle interventions often achieve limited and un-sustained weight loss, while bariatric surgery (BS) has emerged as an effective treatment option for severe adolescent obesity. This study aimed to evaluate short-, medium-, and long-term outcomes of BS among adolescents in Israel, focusing on changes in weight status and cardiometabolic parameters.
Methods: This retrospective cohort study utilized real-world data from Clalit Health Services, the largest healthcare provider in Israel. Adolescents aged 10–20 years who underwent BS between 2010 and 2024 were included. Demographic, socioeconomic, clinical, and laboratory data were retrieved from electronic health records. Changes in BMI and metabolic parameters were analyzed using mixed-model repeated measures.
Results: A total of 1,035 adolescents (69.7% females) met inclusion criteria. Median age at surgery was 18.6 years, and median preoperative BMI was 43.0 kg/m^2. Sleeve gastrectomy was the predominant procedure (84.8%). Median follow-up duration was 5.8 years. Significant BMI reductions were observed across all follow-up years (tiil 15 years) ($P_{time} < 0.001$), with the greatest decline occurring within 1–3 years postoperatively. Males exhibited greater BMI reduction than females ($P_{time \times group} < 0.001$). BMI improved similarly across socioeconomic and ethnic groups. Participants with higher baseline BMI maintained higher absolute BMI levels post-surgery despite significant relative improvement.
Conclusions: Bariatric surgery in adolescents resulted in sustained, clinically meaningful weight reduction across demographic subgroups. These findings support BS as an effective long-term treatment for severe adolescent obesity within structured multidisciplinary programs.

OP036 / #700

BODY COMPOSITION MATTERS: GLP-1 ANALOGUE THERAPY IMPROVES BODY COMPOSITION AND METABOLIC SYNDROME COMPONENTS IN ADOLESCENTS

ORAL PRESENTATIONS SESSION 05: MALNUTRITION AND CLINICAL NUTRITION

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Background and Aims: While GLP-1 analogue (GLP-1a) therapy is established in reducing BMI in adolescents with obesity, its effects on body composition and metabolic syndrome (MetS) components remain unclear.
Methods: This real-world study included adolescents with obesity, treated and monitored at the Institute of Pediatric Endocrinology. Routine medical care was provided by a multidisciplinary obesity team and included healthy lifestyle counseling. Based on clinical considerations, GLP-1a therapy was prescribed to 41 of the 67 participants (61.2%), with individualized dosing and management. Z-scores for BMI and body composition parameters assessed via bioimpedance analysis [appendicular skeletal muscle mass (ASMM) and muscle-to-fat ratio (MFR)] were collected at 3 time points: 6 months prior to GLP-1a initiation, at initiation, and during treatment. The differences in variables were calculated between two consecutive study time points. Components of MetS (glucose intolerance, hypertension, and dyslipidemia) were evaluated at each study visit.
Results: During the initial period, when no participants received GLP-1a therapy, weight status, body composition measures, and MetS components remained stable and comparable between the groups. Subsequently, adolescents receiving GLP-1a therapy experienced greater improvements in weight (-6.0[-14.2, 2.9] vs. 1.75[-0.3, 4.8]kg, P<0.001), BMI z-score (-0.34[-0.57,-0.07] vs. −0.07[−0.17, 0.05], P<0.001), and MFR z-score (0.41[0.12, 0.56] vs. 0.13[0.01, 0.25], P=0.007], whereas changes in ASMM% z-scores were not significant. Multiple regression analyses adjusted for sex, age, sports activity and follow-up duration identified GLP-1a treatment duration as the sole contributor to BMI and MFR z-scores changes (R^2=0.515, P<0.001) and (R^2=0.231, P=0.012), respectively. Logistic regression models found that these favorable changes contributed to a measurable metabolic benefit, as each 0.2 decrease in BMI z-score increased the likelihood of improvement in MetS component count by 2.5-fold, and each 0.2 rise in MFR z-score by 1.9-fold.
Conclusions: GLP-1a therapy led to improved body composition in adolescents with obesity, contributing to the observed improvement in prevalent MetS components.

PD001 / #285

EFFICACY OF ZINC FORTIFIED AND FERMENTED WHEAT FLOUR (EZAFFAW) ON ADOLESCENTS AND ADULT WOMEN IN RURAL PAKISTAN: A RCT

E-POSTER DISCUSSION 01: MALNUTRITION

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Background and Aims: Zinc deficiency poses a significant challenge for public health, particularly among children, adolescents and women. Food bio-fortification and fortification have been established as viable and cost-effective strategies for treating zinc and other micronutrient deficiencies
Methods: We implemented a four-arm, individually randomized, triple-blind trial in a rural district of Pakistan in adolescents and women of reproductive-age. The trial tested agriculturally bio-fortified "high zinc wheat" (>35mg/kg), “fermented bio-fortified”, "post-harvest zinc-fortified wheat flour" (80mg/kg) and compared these to traditional whole wheat flatbread with a lower zinc content (20–25 mg/kg). 1044 participants were equally divided into four groups and were given flatbread from respective flour each day for six months
Results: The intervention showed a notable increase in plasma zinc concentration at end line, resulting in a significant reduction in the prevalence of zinc deficiency across all arms. Metabolic biomarkers such as HbA1c and fasting blood glucose decreased (RR:0.93 (0.91, 0.95)) in the fermented and non-fermented agriculturally bio-fortified "high zinc wheat groups. Anthropometric measurements demonstrated a substantial improvement in the mean height, weight and body mass index (BMI).
Conclusions: Data from this four-arm randomised controlled trial suggests that zinc fortification/biofortification could potentially be employed as an effective approach for combating micronutrient deficiencies, particularly in marginalised communities where the burden of micronutrient deficiencies remains high and accessibility to nutritious meals continues to be low.

PD002 / #350

ASSOCIATIONS BETWEEN GROWTH AND APPETITE HORMONES VS. BODY COMPOSITION IN UNDERNOURISHED CHILDREN: FINDINGS FROM THE MARVEL STUDY

E-POSTER DISCUSSION 01: MALNUTRITION

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Background and Aims: Undernourished children may have alterations in body composition and its hormonal regulation**.** This study aimed to assess the associations between growth and appetite hormones vs. anthropometry and body composition in these children.
Methods: Children aged 1-6 years with weight-for-height z-score (WFHZ) between -1 and -3 SD (WHO standards) were recruited. Fasting serum IGF-1 and IGF-BP3 were measured by ELISA; ghrelin, leptin, peptide YY, and insulin were measured by Luminex®. Body composition was assessed by bioelectrical impedance analysis in children > 3 years. Associations were evaluated by Pearson correlation.
Results: A total of 152 children with average age of 3.5 (95%CI 3.3–3.8) years were recruited as a part of the MARVEL study(TCTR 20220908004), only 84 had body composition data. IGF-1 and IGF-BP3 showed positive correlations with height-for-age z-score(HFAZ) and weight-for-age z-score(WFAZ). Though IGF-1 demonstrated associations with both fatness and lean mass, IGF-BP3 revealed a positive link with only fat-free mass(FFM) and skeletal muscle mass (r 0.327, p 0.003; r 0.320, p 0.004) which disappeared after adjusting for height using FFMI(FFM/height^2). Ghrelin negatively associated with FFMI (r -0.287, p 0.01) and positively correlated with fat mass(FM), FMI(FM/height^2), and visceral fat area(VFA) (r 0.245-0.274, p 0.02-0.04). Leptin, peptide YY, and insulin showed positive relationships with WFHZ and BMI z-score(BMIZ) but inverse associations with VFA (r between -0.309and-0.241, p 0.02-
0.08).

Figure 1 Associations between growth/appetite hormones vs. anthropometry and body composition

	HFAZ	WFAZ	WFHZ	BMIZ	FFM	FFMI	SMM	FM	FMI	VFA
IGF-1	0.336**	0.342**	0.107	0.029	0.467**	-0.157	0.458**	0.365**	0.274*	-0.080
IGF-BP3	0.238**	0.275**	0.134	0.085	0.327*	0.002	0.320*	0.106	0.063	-0.102
Ghrelin	0.121	0.144	0.095	0.063	-0.043	-0.287*	-0.057	0.245*	0.256*	0.274*
Leptin	-0.032	0.161	0.383**	0.345**	-0.100	0.111	-0.093	0.123	0.188	-0.307*
Peptide YY	-0.089	0.058	0.236**	0.278**	-0.142	0.185	-0.108	-0.037	0.020	-0.309*
Insulin	0.035	0.158	0.244*	0.229*	0.028	0.126	0.039	0.112	0.140	-0.241

Abbreviation: HFAZ, height for age z-score; WFAZ, weight for age z-score; WFHZ, weight for height z-score; BMIZ, body mass index z-score; FFM, fat free mass; FFMI, fat free mass index=FFM/height^2; SMM, skeletal muscle mass; FM, fat mass; FMI, fat mass index=FM/height^2; VFA, visceral fat area; IGF-1, insulin like growth factor-1; IGF BP3, insulin like growth factor binding protein 3

Correlations were assessed using the Pearson correlation, n=152, Body composition was measured in children > 3 years old, n=84

An asterisk (*) indicates $p < 0.05$, and a double asterisk (**) indicates $p < 0.01$

Conclusions: Growth hormones derivatives positively associated with linear growth whereas appetite hormones tend to associate with fatness and central fat deposition albeit in different directions. These associations underlined the physiology of growth and appetite regulation in undernourished children.

PD003 / #192

FACTORS ASSOCIATED WITH STUNTING AND ANAEMIA AMONG YOUNG CHILDREN IN A HIGH BURDEN PACIFIC POPULATION

E-POSTER DISCUSSION 01: MALNUTRITION

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Background and Aims: Childhood stunting and anaemia are highly prevalent health conditions in Papua New Guinea (PNG), yet limited data exist on their co-occurrence and causes or risk factors. An enhanced understanding is needed to guide targeted and novel interventions. This study investigated the development of and risk factors for stunting and anaemia in children aged 6-59 months in PNG.
Methods: A cross-sectional, community-based study included 830 children and 650 caregivers across nine rural and urban villages in a high burden and malaria-endemic setting. Data collection included anthropometry, risk-factor questionnaires, haemoglobin and malaria testing, and laboratory analysis for relevant micronutrients. Descriptive statistics, regression analysis and geospatial analysis were completed.
Results: Stunting prevalence was 12% among children aged 6–12 months, increasing to 27–29% in children aged 1–4 years, and reaching up to 38% in some communities. Females had 41% lower odds of stunting than males, and stunting was associated with poor water and sanitation quality and specific geographic locations. Prevalence of anaemia was very high, ranging from 36–90%, and was highest in children <2 years old. There was substantial overlap between stunting and anemia, and moderate anaemia increased the odds of stunting by 96%. Associations with specific nutritional deficiencies, infectious exposures, and inflammation are currently being investigated.
Conclusions: Stunting and anaemia were widespread and showed substantial geographic variation, with many children affected in the first two years of life. These findings highlight the need for specific, early-life interventions.

PD004 / #772

VALIDATION OF WORLD HEALTH ORGANISATION GROWTH STANDARD WITH INDIAN ACADEMY OF PAEDIATRICS GROWTH CHART AMONG SCHOOLS GOING CHILDREN IN EASTERN INDIA

E-POSTER DISCUSSION 01: MALNUTRITION

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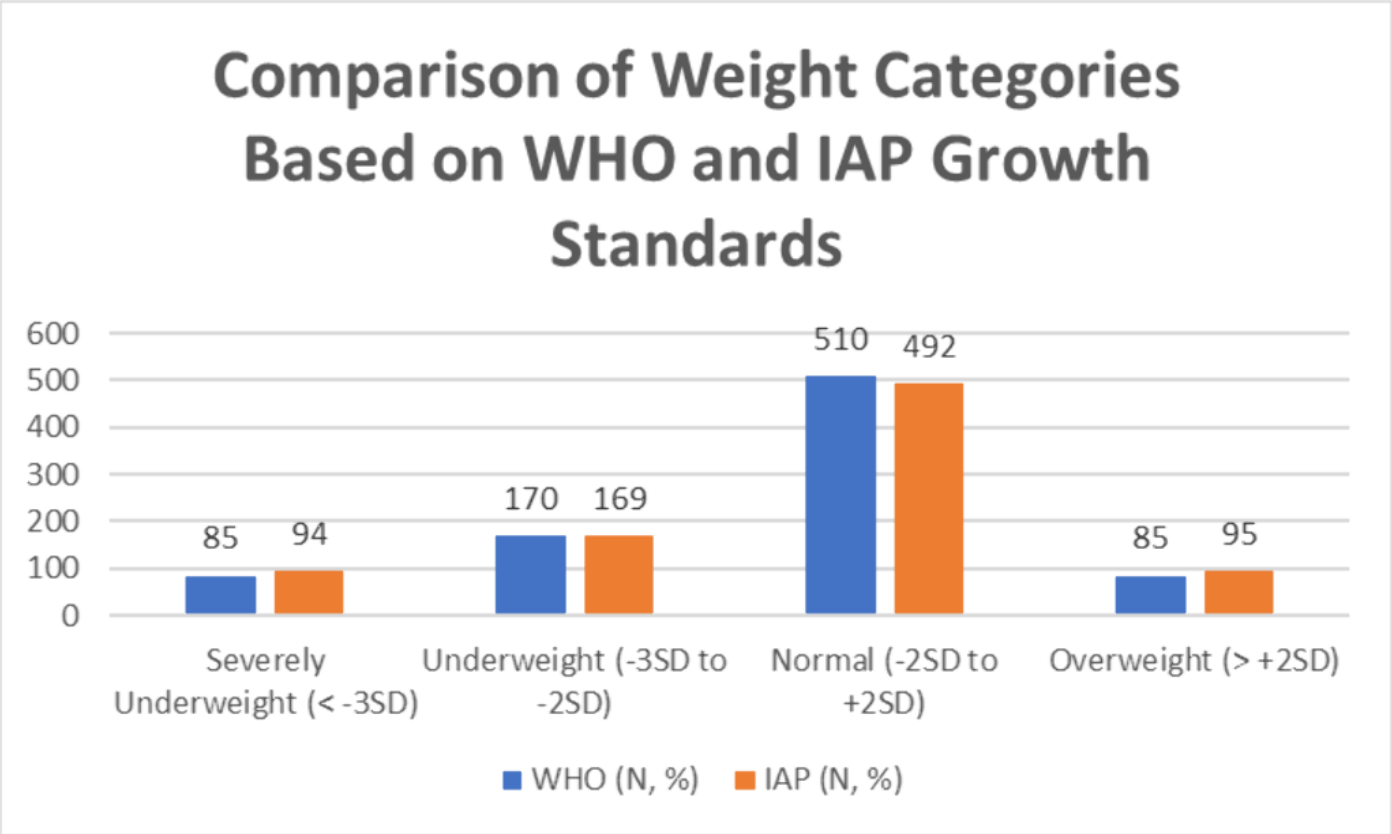
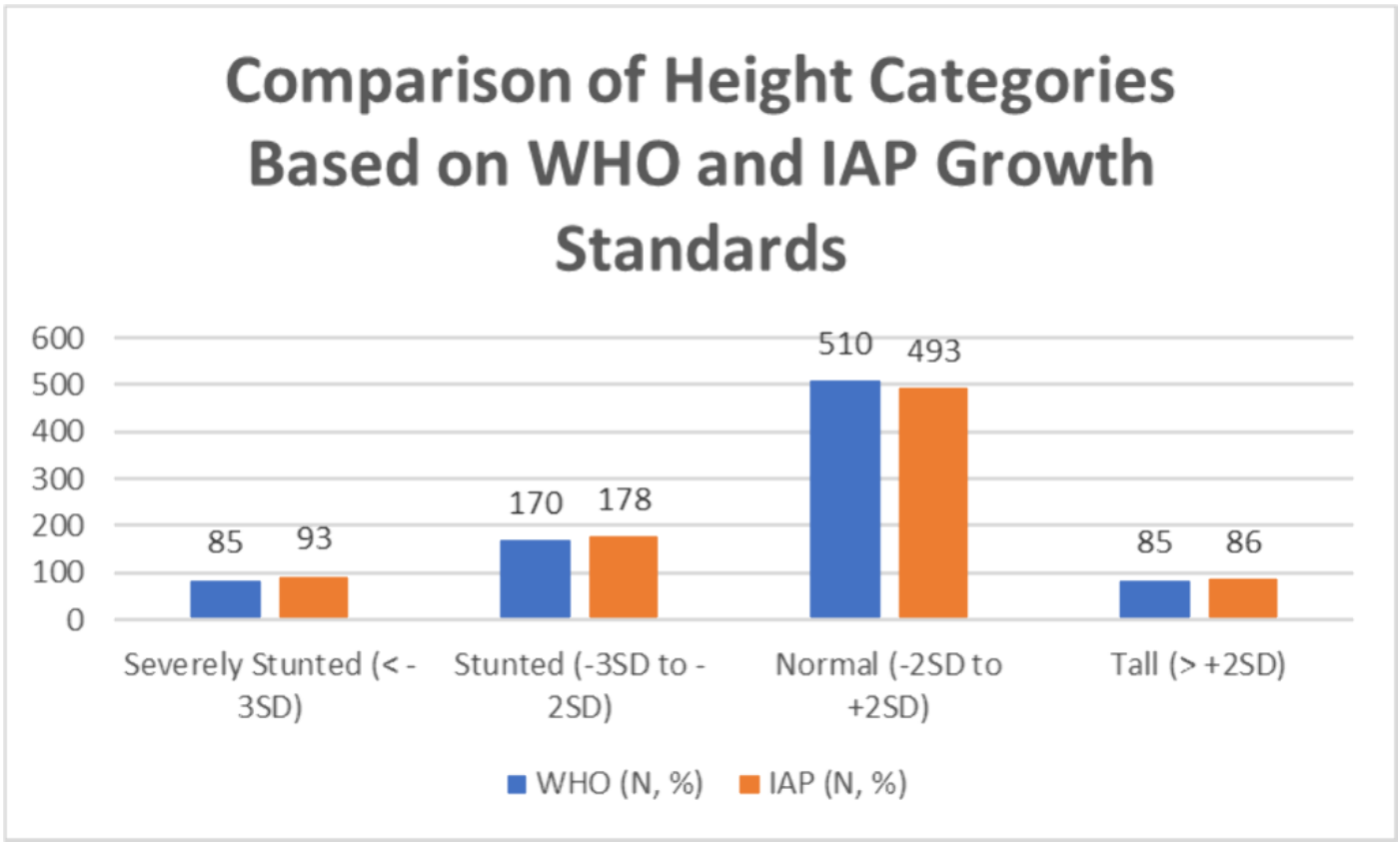
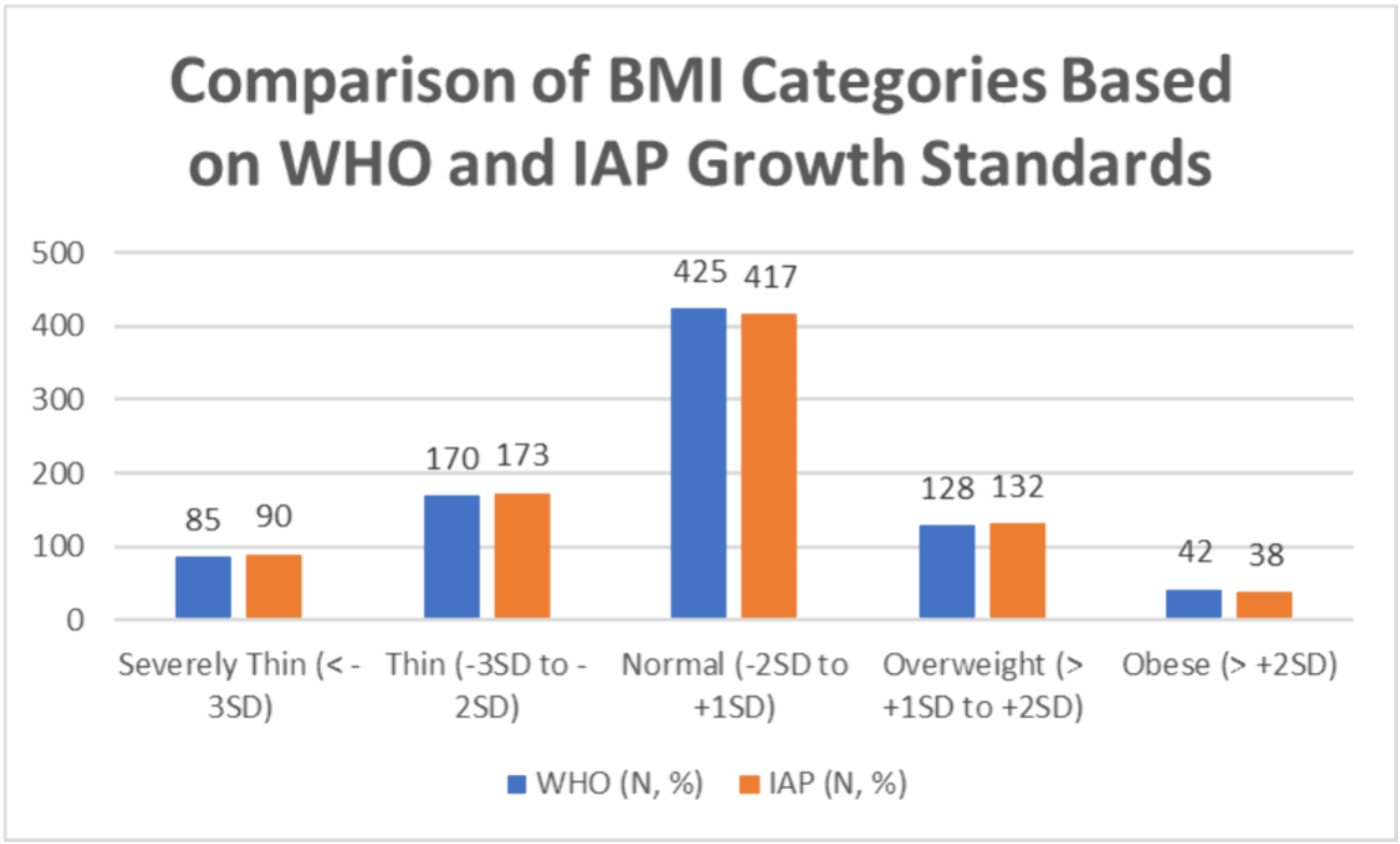
Background and Aims: WHO growth charts are considered a global standard for evaluating the physical development of children.These charts were developed from data collected on children from diverse geographical locations, living under optimal conditions that support healthy growth.However, in India, pediatricians often use an additional set of growth charts—those developed by the Indian Academy of Paediatrics (IAP). While the WHO growth charts are based on international standards, some argue that they might not be entirely suitable for Indian children due to differing growth trajectories influenced by local factors.In this regard, validating the WHO growth charts against the IAP growth charts becomes critical. **AIM** To compare the anthropometric measurement in school going children using WHO and IAP growth charts.
Methods: The study was designed as a community-based observational study to evaluate the anthropometric measurements of school-going children aged between 6 to 12 years.in Katihar District, Bihar, Estern part of India. Comparisons between the WHO and IAP growth charts were performed using appropriate inferential statistical methods, such as paired t-tests or chi-square tests
Results:



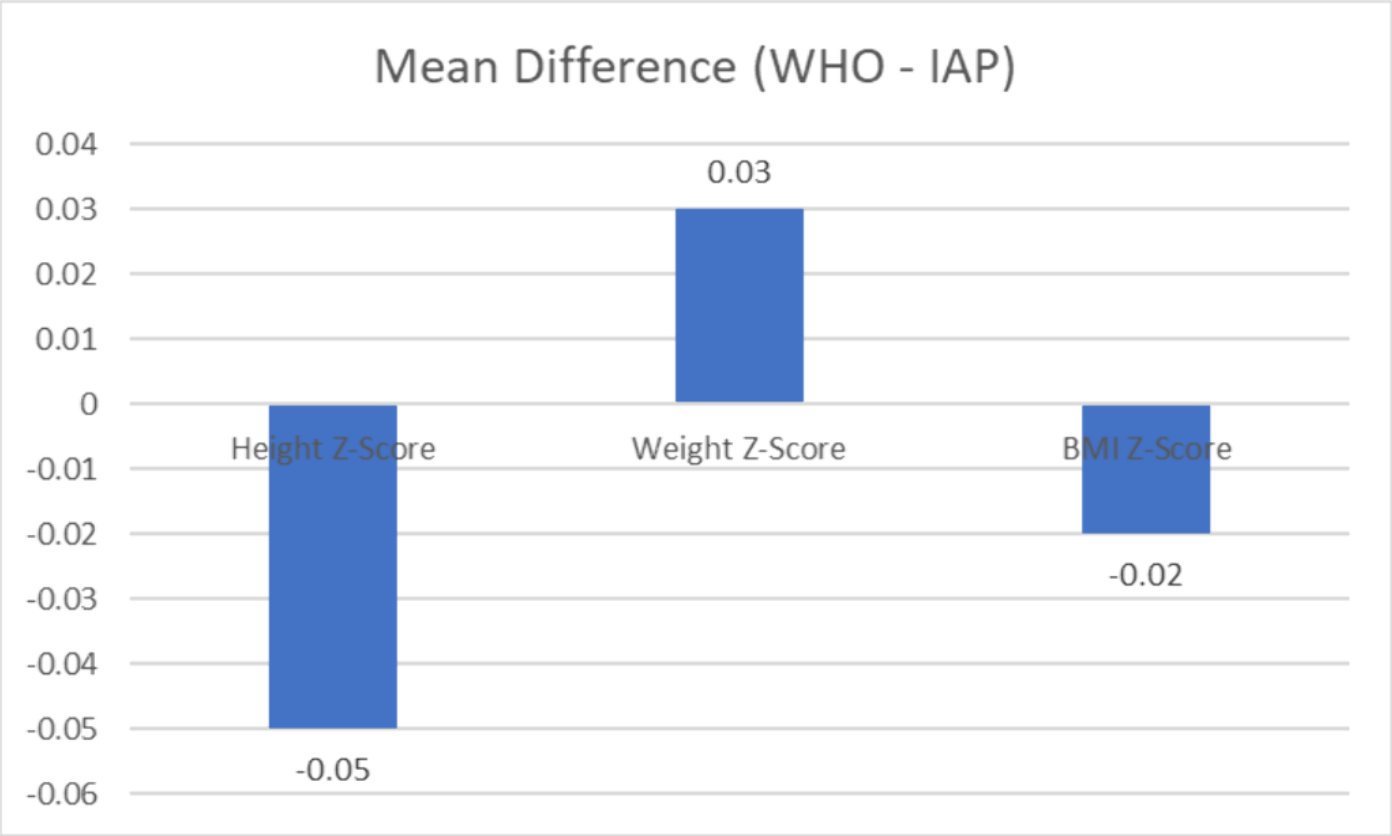




Variable	χ^2 Value	p-value
Height-for-Age	12.35	0.002

Weight-for-Age	9.87	0.008
BMI-for-Age	15.42	0.001

Chi-Square Test Results for Growth Variables



Conclusions: The findings suggest that while both growth standards identified similar trends in stunting, underweight, and obesity, there were noticeable differences in the way they classified children's nutritional status. The WHO charts, being global in nature, tended to overestimate the prevalence of stunting and underweight, while the IAP charts are more regionally adapted, provided a more accurate reflection of local growth patterns in Indian children.

PD005 / #733

SYNERGISTIC EFFECTS OF FORTIFIED BABY FOODS AND DIETARY DIVERSITY ON STUNTING AND ANAEMIA: A COMPARATIVE ANALYSIS OF NFHS-4 AND NFHS-5 INDIA

E-POSTER DISCUSSION 01: MALNUTRITION

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Background and Aims: Malnutrition among children in the first 1000 days remains a major public health issue despite the implementation of extensive nutritional programs in recent years. This study explores the link between the intake of commercial fortified baby foods (FBF) and nutritional outcomes (stunting, wasting, underweight, and anaemia) among children aged 6 - 23 months.
Methods: Data from both NFHS 2015-16 and 2019-21 were used to analyse the study objective. Bivariate association and logistic regression models were employed to calculate crude (cOR) and adjusted odds ratios (aOR). Interaction effects between fortified baby foods and other nutrient-dense food groups were also explored.
Results: Univariate analysis showed significant protective effects for all indicators. In the fully adjusted NFHS-5 model, children consuming FBF had lower odds of stunting (aOR, 0.93; 95% CI, 0.88-0.98) and anaemia (aOR, 0.90; 95% CI, 0.84-0.95). Notably, a synergistic interaction was observed, that protective effect against anaemia was maximized when FBF were combined with flesh foods (aOR; 0.78, 95% CI, 0.70-0.88) and minimum dietary diversity (aOR, 0.89; 95% CI, 0.8-0.97). Interestingly, while FBF protects from malnutrition, their association with weight-for-age in NFHS-5 (aOR: 1.07) suggests they could be used as a rescue food in already vulnerable households.
Conclusions: Commercially, FBF is significantly associated with reduced risks of stunting and anaemia in Indian infants. However, the impact is significantly enhanced when integrated with high-quality dietary diversity. Public health strategies should promote fortified complementary foods not as a standalone solution, but as a component of a diverse, nutrient-dense diet to combat the "double burden" of malnutrition.

PD006 / #747

90TH AND 95TH PERCENTILES OF FASTING INSULINEMIA AND HOMA FOR EUTROPHIC SCHOOLCHILDREN AND ADOLESCENTS

E-POSTER DISCUSSION 02: OBESITY

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Background and Aims: Insulin resistance (IR) is one of the conditions frequently associated with pediatric obesity and its presence significantly increases the risk of other comorbidities that characterize metabolic syndrome. One of the ways to evaluate IR is to verify the presence of compensatory hyperinsulinism, which can be estimated through fasting insulinemia or the Homeostasis Model Assessment (HOMA), although the cutoff points have not yet been defined. The objective of the present study was to define 90th and 95th percentile values for these two indicators, obtained from a sample of Brazilian eutrophic children and eutrophic mid-maturing adolescents.
Methods: Patients involved were students from a public school aged between 7 and 18 years. From the total universe of eligible individuals (625), 144 were excluded: body mass index z-scores lower than -2 or greater than +1; diseases that could interfere with the variables; early or delayed sexual maturation; blood sample not collected. 481 met the criteria and underwent fasting glucose (enzymatic method) and insulin levels (automated chemiluminescence) measurements and HOMA values calculation (plasma glucose (mol/dL)×plasma insulin (µUI/mL)/22.5). The results were consolidated using the percentile distribution.
Results: Tables 1 and 2 show the 90th and 95th percentiles of fasting insulinemia and HOMA according to age groups and
gender.

Table 1 - 90th and 95th percentiles of fasting insulinemia (µUI/mL)

Age (years)	90th percentile		95th percentile	
	Boys (n=187)	Girls (n=294)	Boys (n=187)	Girls (n=294)
7 - 8 (30 boys; 41 girls)	6,44	5,70	7,92	6,30
9 - 10 (32 boys; 56 girls)	7,28	11,15	8,30	13,28
11 - 12 (38 boys; 67 girls)	8,51	11,06	9,95	13,58
13 - 14 (61 boys; 73 girls)	12,00	12,82	14,50	15,02
15 - 18 (26 boys; 57 girls)	9,00	9,98	9,53	11,14

Table 2 - 90th and 95th percentiles of HOMA

Age (years)	90th percentile		95th percentile	
	Boys (n=187)	Girls (n=294)	Boys (n=187)	Girls (n=294)
7 - 8 (30 boys; 41 girls)	1,46	1,18	1,62	1,41
9 - 10 (32 boys; 56 girls)	1,65	2,47	1,91	2,99
11 - 12 (38 boys; 67 girls)	1,93	2,57	2,11	3,06
13 - 14 (61 boys; 73 girls)	2,46	2,87	3,42	3,70
15 - 18 (26 boys; 57 girls)	2,12	2,23	2,33	2,32

Conclusions: The values for the 90th and 95th percentiles for fasting insulinemia and HOMA obtained in a sample of eutrophic individuals are presented. Further studies should be conducted to define the best cutoff point and clinical validation.

PD007 / #582

BEYOND BMI: RETHINKING METABOLIC RISK IN PEDIATRIC OBESITY

E-POSTER DISCUSSION 02: OBESITY

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Background and Aims: Pediatric obesity is a major global health challenge, associated with early cardiometabolic complications. BMI is widely used but does not distinguish fat from lean mass. Bioelectrical impedance analysis (BIA) offers a rapid, non-invasive assessment of body composition.This study compared BIA-derived parameters with BMI in identifying cardiometabolic risk in children /adolescents with excess weight.
Methods: Children/adolescents followed in a pediatric obesity outpatient clinic (tertiary hospital) between April-June 2025 underwent anthropometry, BIA, laboratory testing and abdominal ultrasound. Descriptive statistics and comparative models were used to assess the association between BMI z-score and BIA parameters (percent body fat(%BF), fat mass index(FMI), fat-free mass index(FFMI)) with cardiometabolic alterations (significance when $p<0.05$).
Results: 91 participants were included (49.5% male; median age 14 years). Family history of obesity was present in 68.1%, bariatric surgery in 11% and premature cardiovascular disease in 8.8%. Median BMI z-score was +2.9 SD; 92.3% had obesity (25.3% class III).
BIA revealed high adiposity, with >24.2% showing %BF >50% and 46.2% FMI >P95. Abnormal blood pressure(BP) occurred in 37.4%. Dyslipidemia was frequent (high total cholesterol 12.1%,high LDL 6,6%,low HDL 25%,high triglycerides 27.3%), and MASLD was identified in 34.1%.
BMI z-score correlated significantly with elevated transaminases, HbA1c and BP($p < 0.05$). From BIA-derived parameters, FMI demonstrated stronger associations with high triglycerides($p=0.018$),low HDL($p=0.029$) and abnormal BP($p=0.009$).
Conclusions: BMI remains essential to clinical assessment, BIA—particularly FMI—showed a stronger relationship with key metabolic alterations. Integrating BIA may improve cardiometabolic risk stratification and support more premature management in pediatric obesity.

PD008 / #198

SERUM METABOLOMIC PROFILING PREDICTS METABOLIC DYSFUNCTION–ASSOCIATED STEATOTIC LIVER DISEASE IN CHILDREN WITH OBESITY

E-POSTER DISCUSSION 02: OBESITY

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Background and Aims: Metabolic dysfunction–associated steatotic liver dsease (MASLD) represents a major hepatic complication of pediatric obesity. However, its underlying metabolic alterations remain incompletely characterized. This study aims to investigate serum metabolomic differences between obese children with and without MASLD.
Methods: We analyzed 160 children with obesity, including 80 with MASLD and 80 without. Each MASLD case was age-, gender-, and BMI-matched with a control participant. Anthropometric data, biochemical measurements, and serum metabolites—including short-chain fatty acids, bile acids, and tryptophan-related compounds—were quantified using gas chromatography–mass spectrometry (GC-MS). Group comparisons were performed using independent t-tests, and receiver operating characteristic (ROC) curve analysis was conducted to evaluate diagnostic performance.
Results: Compared with controls, children with MASLD had significantly higher waist circumference, waist-to-hip ratio, blood pressure, liver enzymes (AST, ALT, γ-GT), triglycerides, insulin, HOMA-IR, and serum cytokeratin-18 fragment levels. No significant differences were found in serum bile acid profiles. However, several tryptophan-related metabolites, including indole-3-acetic acid (IAA) and tryptophan (Trp), were notably altered in the MASLD group. A combined model incorporating ALT, waist circumference, triglycerides, and IAA achieved strong diagnostic performance for predicting MASLD, with an area under the ROC curve (AUC) of 0.886, indicating high sensitivity and specificity as a non-invasive predictive tool.
Conclusions: Children with MASLD exhibit unique biochemical and metabolic patterns. The identified serum metabolomic signature holds promise as a non-invasive predictor of pediatric MASLD.

PD009 / #621

FIVE-YEAR CLINICAL TRIALS ON OBESITY IN CHILDREN AGED 0 – 17 YEARS: A CLINICAL TRIAL LANDSCAPE ANALYSIS

E-POSTER DISCUSSION 02: OBESITY

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Background and Aims: The prevalence of obesity and overweight in children remains a significant public health concern globally. Higher chances of premature death and disability in adulthood have been associated with obesity in children. Obesity and overweight are largely preventable. Hence, this study investigated the five-year clinical trial pipeline for obesity in children.
Methods: ClinicalTrials.gov (the world's largest clinical trial register) was searched from September to November 2025 for obesity-related clinical trials (CTs) in children aged 0 – 17 years, first posted between 01/11/2020 – 29/11/2025. The inclusion and exclusion criteria in Table 1 were used for screening. Included CTs were analysed using Power BI Desktop Version 2.149.911.0. Results were presented in charts and tables.

Five-Year Clinical Trials on Obesity in Children Aged 0 – 17 Years: A Clinical Trial Landscape Analysis

Table 1: Inclusion and Exclusion Criteria

Criteria	Include	Exclude
First Posted	On or after 1st November 2020	Earlier than 1st November 2020
Trial Phase	Phases 1, 2, 3, 4	Phase not applicable
Study Type	Interventional studies	Observational studies, Expanded access
Recruitment Status	Not yet recruiting, Recruiting, Enrolling by invitation, Active but not recruiting, Completed	Terminated, Suspended, Withdrawn, Unknown

Screening Process

First Search Date: 26 September 2025
Second Search Date: 24 October 2025
Final Search Date: 29 November 2025

Total records retrieved from the initial search on obesity clinical trials in children aged from birth to 17 years (N) = 2,842
Total records after applying the inclusion and exclusion criteria (N) = 80

One extra record was screened out for the following reason:

1. Oxytocin for the induction of labour in women with obesity

Total records included in the final analysis (N) = 79

Definitions: Age
Child: 0 – 17 years
Adult: 18 – 64 years
Adult_ Older: 65 years and over

Definitions: Funder Types
NIH: National Institutes of Health
Others: Individuals, universities, hospitals, nonprofit
Industry: Pharma/MedTech companies

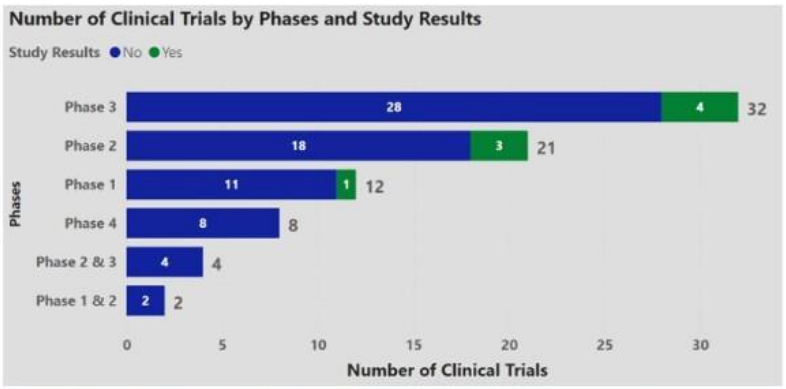
Link:
https://clinicaltrials.gov/search?cond=Obesity&aggFilters=ages:child,phase:0%201%202%203%204,status:not%20rec%20act%20com%20enr,studyType:int&firstPost=2020-11-01

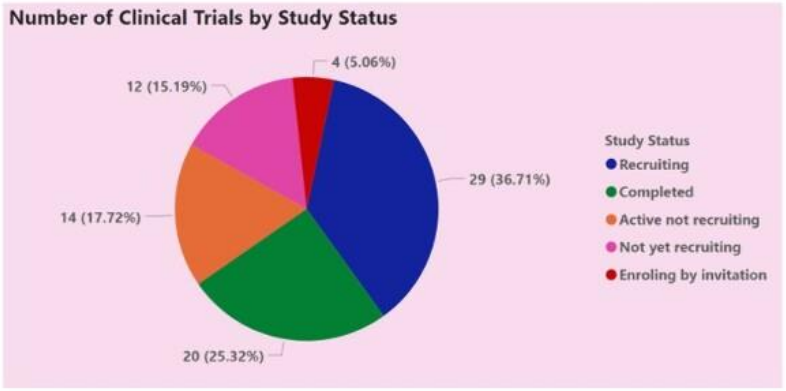
Results: A total of 79 CTs and 4,717 participants were included in the analysis. About 37% (29/79) and 25% (20/79) of CTs were in the recruiting and completion stages, respectively. Approximately 41% (32/79) and 27% (21/79) were at phases 3 and 2, respectively. The majority of the CTs were either funded by industries (49%) or by individuals, hospitals, universities and nonprofits (48%). Most CTs were drugs (78%) and behavioural interventions (10%). North America, Europe and Asia are the top three regions with the highest number of obesity-related CTs for children (Figures 1 & 2).

Intervention Type	Number of Clinical Trials	Number of Participants
Drug	62	10977
Behavioural	8	2271
Drug |Behavioural	4	334
Device	2	302
Biological	1	33
Combination product	1	720
Other	1	80
Total	**79**	**14717**

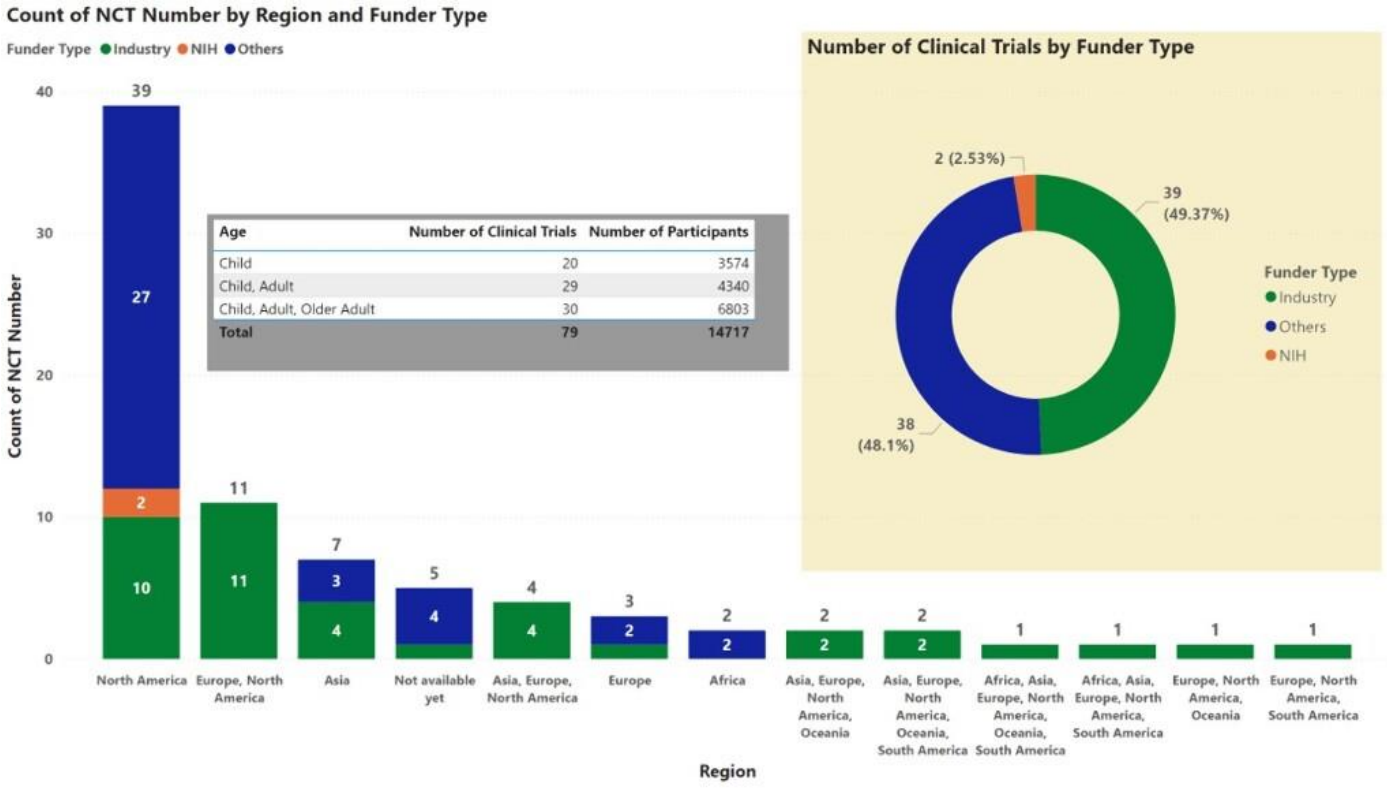
Conditions	Number of Clinical Trials	Number of Participants
Obesity	60	13647
Prader-Willi Syndrome	12	855
Obesity / Prader-Willi Syndrome	2	35
Bardet-Biedl Syndrome / Proopiomelanocortin (POMC) deficiency	1	19
Lipidosis	1	50
Lipodystrophy	1	9
Obesity / Bardet-Biedl Syndrome	1	12
Pre-Diabetes	1	90
Total	**79**	**14717**

Primary Sponsor	Number of clinical trials	Number of participants
Industry	42	8919
University	25	4808
Hospital	8	588
Government	2	186
Investigator-led	1	114
Nonprofit	1	102
Total	**79**	**14717**





Age	Number of Clinical Trials	Number of Participants
Child	20	3574
Child, Adult	29	4340
Child, Adult, Older Adult	30	6803
Total	**79**	**14717**



Conclusions: The various intervention types reflect the complex nature of obesity management in children, which extends beyond therapeutics alone. The balanced funding between industries and other organisations highlights the importance of both profit-driven and non-profit-driven interventions in managing obesity in children. This study was limited to CTs posted on ClinicalTrials.gov.

PD010 / #543

NUTRIENT-BASED DIETARY PATTERNS AND METABOLIC OUTCOMES FOLLOWING A MEDITERRANEAN DIET-BASED INTERVENTION IN CHILDREN AND ADOLESCENTS WITH OBESITY

E-POSTER DISCUSSION 02: OBESITY

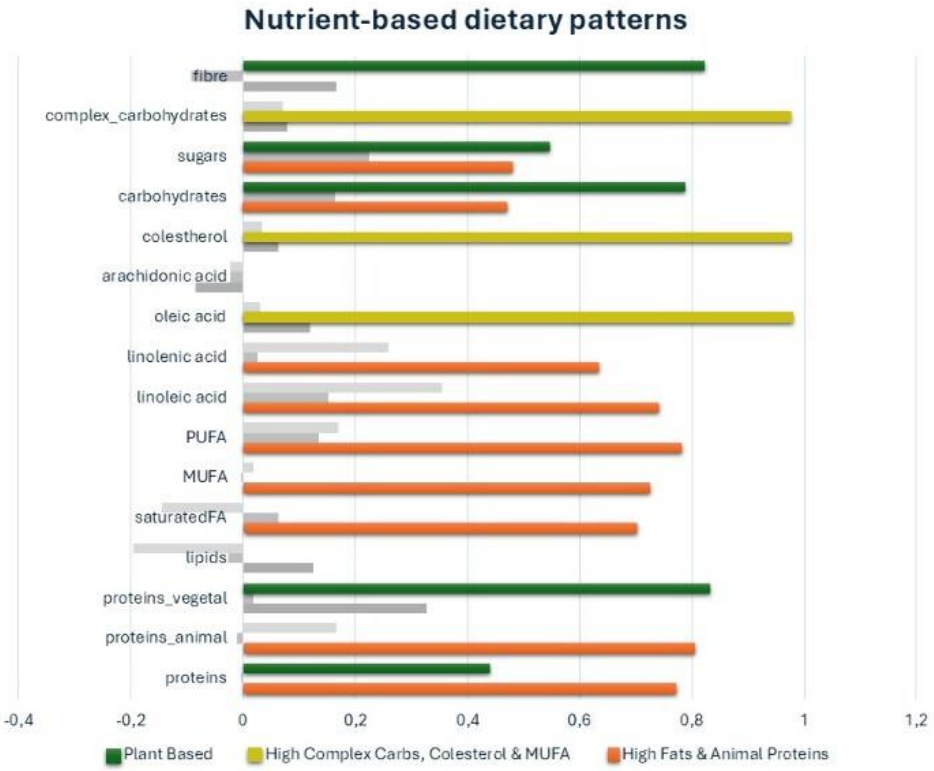
Giulia Fiore[1,2], Chiara Milanta[2], Martina Tosi[2], Francesca Eletti[2,3], Sara Vizzuso[2], Mario Mancini[4], Franco Folli[5,6], Elvira Verduci[2,5]

[1]University of Milan, Biomedical And Clinical Science, Milan, Italy, [2]Vittore Buzzi Children's Hospital, University of Milan, Department Of Pediatrics, Milan, Italy, [3]University of Milan, Children Hospital Vittore Buzzi, Milan, Italy, [4]San Paolo Hospital, Pediatric And Adolescent Andrological Unit, Department Of Pediatrics, Milan, Italy, [5]University of Milan, Department Of Health Sciences, Milan, Italy, [6]San Paolo Hospital, Departmental Unit Of Diabetes And Metabolic Diseases, Milan, Italy

Background and Aims: Dietary interventions within multicomponent behavioral programs are the gold standard for treating childhood obesity. This study aimed to identify nutrient-based dietary patterns in children with obesity and examine their association with cardiometabolic changes following a long-term Mediterranean diet–based behavioural intervention.

Methods: In this multicentre intervention study, we enrolled children and adolescents at the Vittore Buzzi Children's Hospital and San Paolo Hospital, aged 5-18 years old with obesity, defined as >+2 DS BMI-for-age SDS according to WHO reference curves. All children received a Mediterranean diet-based behavioral nutritional intervention from enrolment through the 12-month follow-up. Anthropometric measurements, blood analyses, and food frequency questionnaires (FFQ) were collected at each assessment timepoint. A posteriori dietary patterns were identified through exploratory principal component factor analysis performed on 16 nutrients derived from the FFQ.

Results: We enrolled 252 children (160 M, 92 F; mean age 10.3±2.4 years). Following the intervention, significant reductions were observed in BMI SDS (mean change –0.30±0.35, $p<0.001$), LDL cholesterol (–6.4±22.0, $p<0.001$), triglycerides (–11.1±48.3, $p<0.001$), and HOMA index (–0.5±2.57, $p=0.014$).We identified three main nutrient-based dietary patterns named "High Fats & Animal Proteins" (DP1), "High Complex Carbs, Cholesterol & MUFA" (DP2) and "Plant Based" (DP3)". Dominant nutrients for each pattern (factor loadings≥0.4) are shown in Figure 1. Higher adherence to DP1 was associated with a modest increase in fasting blood glucose over time ($r=0.156$, $p=0.043$).



Conclusions: The characterization of nutrient-based dietary patterns prior to a nutritional intervention may help predict metabolic responsiveness and potential cardiometabolic changes during nutritional intervention in children and adolescents with obesity

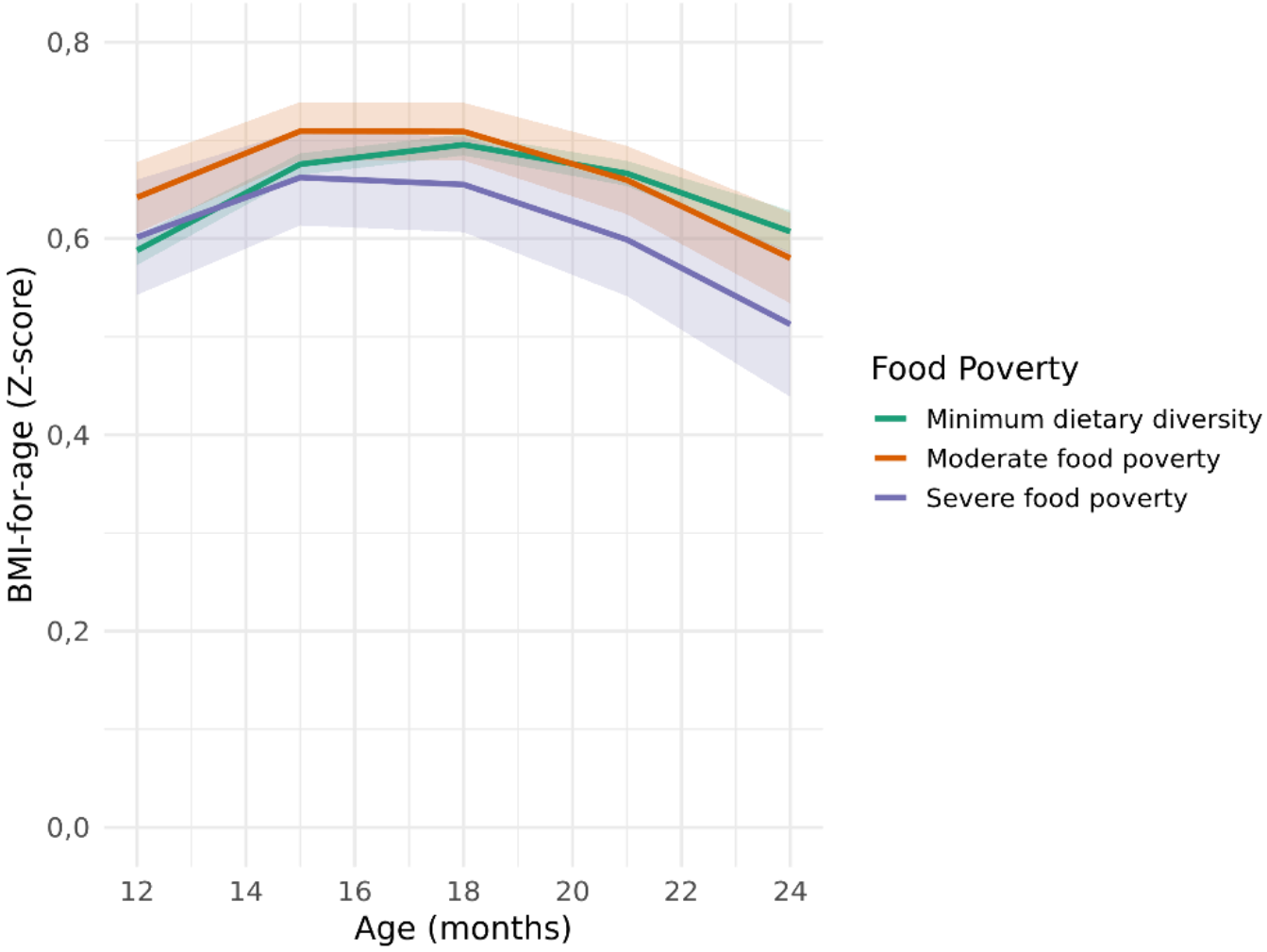
PD011 / #547

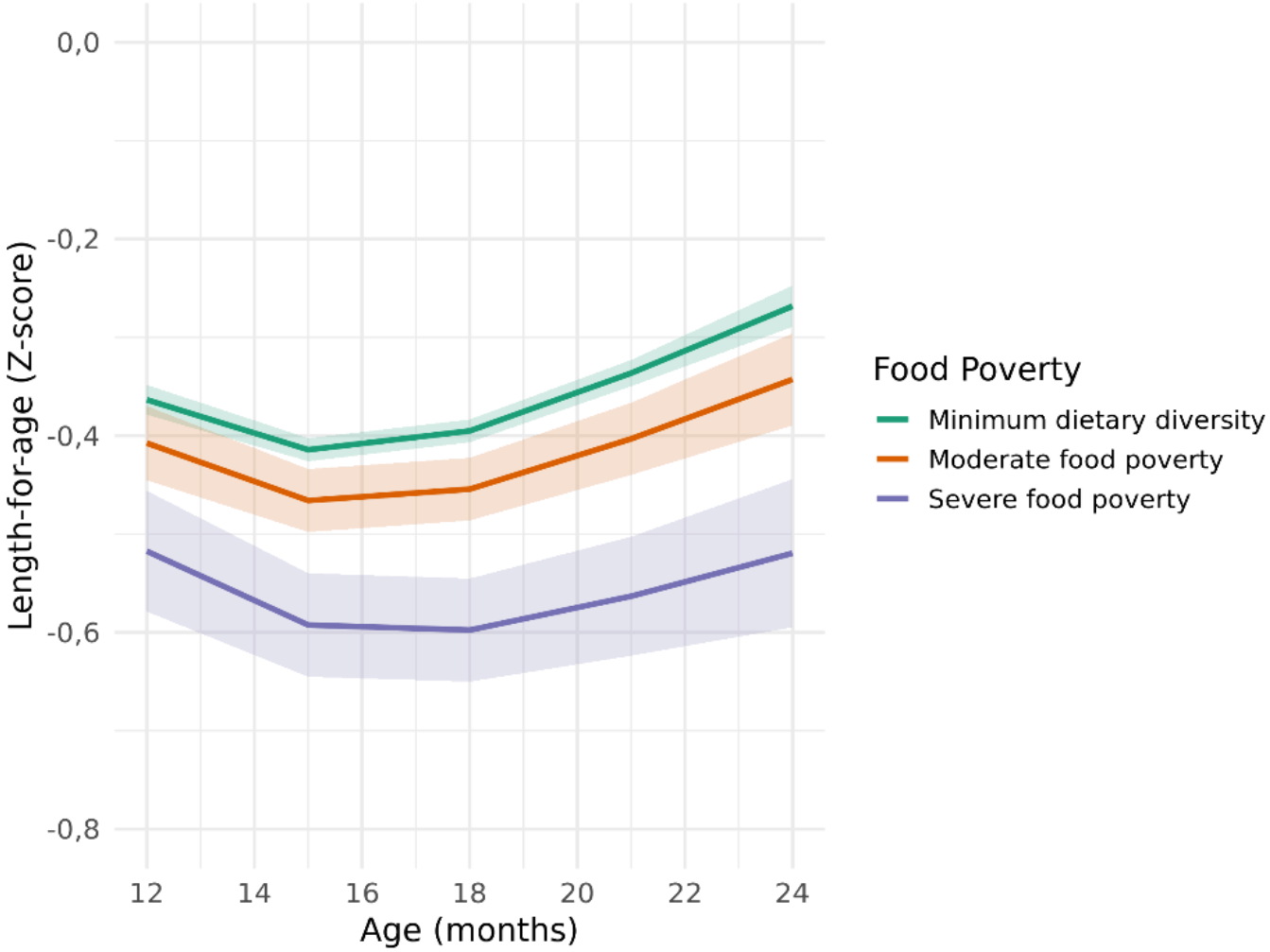
ASSOCIATION BETWEEN FOOD POVERTY AND GROWTH TRAJECTORIES IN BRAZILIAN CHILDREN UNDER TWO YEARS OF AGE: RESULTS FROM THE FOOD AND NUTRITION SURVEILLANCE SYSTEM

E-POSTER DISCUSSION 03: GENERAL NUTRITION AND GROWTH

José Thiago Alves De Sousa, Giovana Nigri Cursino, Nathália Teixeira De Oliveira, Letícia Quaresma Paolino, Paulo César Pereira De Castro Junior, Dayana Rodrigues Farias
Federal University of Rio de Janeiro, Nutrition Institute, Rio de Janeiro, Brazil

Background and Aims: Food poverty (FP), characterized by limited access to adequate and diverse foods, may negatively affect children's growth patterns. This study aimed to assess the association between FP and growth trajectories in Brazilian children.
Methods: This longitudinal study used microdata from 86,709 children aged 10-23 months registered in the Food and Nutrition Surveillance System (2015–2019). BMI-for-age (BMI/A) and length-for-age (L/A) z-scores were classified according to WHO criteria between 12-23 months. Minimum Dietary Diversity (MDD) was estimated at 10–12 months considering the consumption of ≥5 out of 8 food groups: (1)breast milk; (2)cereals; (3)vitamin A–rich fruits and vegetables; (4)meat; (5)eggs; (6)legumes; (7)other fruits and vegetables; and (8)milk and dairy products. The absence of MDD was classified as moderate FP (3–4 groups) and severe FP (≤2 groups). We used linear mixed-effects models including an interaction term between FP and child age, adjusted for macro-region, Bolsa Família program, HDI and Gini index.
Results: Children exposed to moderate FP showed slower BMI-for-age gains over time (β= -0.007; p-value= 0.005), and those experiencing severe FP had an even steeper decline ($\beta_{L/A}$= -0.009; p-value= 0.019). Moderate FP did not significantly affect linear growth ($\beta_{L/A}$= -0.002; p-value= 0.281), whereas severe FP was associated with reduced linear growth over time (β= -0.008; p-value = 0.031).


0,8
0,6
0,4
0,2
0,0
BMI-for-age (Z-score)
12
14
16
18
20
22
24
Age (months)
Food Poverty
Minimum dietary diversity
Moderate food poverty
Severe food poverty



Conclusions: FP was negatively association with both BMI/A and L/A growth trajectories. These findings suggest that the absence of MDD impacts growth over time, highlighting the urgent need for policies that expand access to adequate and diverse foods to prevent early nutritional inequalities.

PD012 / #694

INTEGRATING NUTRITION INTERVENTIONS INTO ROUTINE IMMUNISATION PROGRAMMES OR VICE VERSA IN CHILDREN UNDER FIVE: A SYSTEMATIC REVIEW

E-POSTER DISCUSSION 03: GENERAL NUTRITION AND GROWTH

Seokyeong Lee[1,2], Abou Ba[3], Bapon Mankhin[4], Grace O'Donovan[2], Louise Tina Day[2], Ruth Lennox[4], Tabitha Van Immerzeel[2], Abhinav Verma[5], Corina-Maria Campian[5], Yashodhara Rana[6], Michiko Toizumi[1], Marko Kerac[2]
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Background and Aims: Routine immunisation offers critical, frequent contact points with children under five, providing a prime opportunity to deliver essential nutrition interventions. This systematic review synthesises global evidence on the feasibility, impact, and challenges of integrating diverse nutrition services into routine immunisation platforms to determine both the benefits and implementation barriers.
Methods: Adhering to PRISMA guidelines, a comprehensive search was undertaken across five electronic databases for studies published between January 2000 and December 2024. A total of 47 studies were included, spanning diverse countries and methodologies (RCTs to campaigns). Two independent reviewers screened and extracted data for each study. Interventions focused on integrating services—including IYCF counselling, micronutrient supplementation (e.g., VAS), growth monitoring, and malnutrition screening—delivered at the same-location level.
Results: Integration proved feasible and impactful, achieving high coverage for micronutrient supplementation (VAS) and yielding significant improvements in IYCF practices, including increased Exclusive Breastfeeding (EBF) prevalence. Integration was beneficial to immunisation outcomes, successfully reducing "zero-dose" children and facilitating the identification and referral of Severe Acute Malnutrition (SAM) cases. However, the evidence showed critical fidelity gaps, with core services (like anthropometric assessment) often provided at very low rates.
Conclusions: Integration offers a powerful synergistic approach to improving both nutritional and immunisation outcomes globally. The platform is acceptable to parents (98% satisfaction) and staff. However, quality of service delivery remains a significant challenge due to persistent fidelity gaps. Key barriers comprise provider workload, longer client wait times, and insufficient supervision/training. Successful integration requires investing in frontline capacity and addressing systemic operational bottlenecks to ensure functional, high-quality service delivery.

PD013 / #209

EFFECT OF HUMAN IDENTICAL GM3 GANGLIOSIDE ON BASAL AND LPS-MEDIATED CYTOKINE PRODUCTION BY MONOCYTES: A COMPARISON WITH BOVINE GM3 GANGLIOSIDE.

E-POSTER DISCUSSION 03: GENERAL NUTRITION AND GROWTH

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Background and Aims: Breastmilk contains bioactive lipids such as gangliosides. GM3 is the major ganglioside found in mature human milk. Recent data indicate that the acyl chain length of GM3 determines its pro- or anti-inflammatory effect (Kanoh et al, 2020). The objective of this study was to compare human identical C18 GM3 with bovine GM3, which contains mostly longer acyl chain lengths.
Methods: Human monocytes were incubated with either human identical or bovine GM3 for 1 hour at physiological doses (5-10-15 mg/l), prior to LPS treatment (0,05-0,1 -1 or 10 ng/ml). Supernatants were collected after 24 hours and pro-inflammatory cytokine secretion (TNFα, IL-6, IL-1β, IL-12p40) was evaluated by ELISA.
Results: In basal conditions, human identical GM3 inhibited significantly the production of all pro-inflammatory cytokines while bovine GM3 decreased only TNFα and increased levels of IL-1β and IL-12p40. With low doses of LPS (≤0,1 ng/ml), similar effects were observed. With higher doses of LPS (1 or 10 ng/ml), both gangliosides inhibited significantly TNFα production, however bovine GM3 was effective only at high dose for the LPS highest dose. IL-6 and IL-1β were not consistently impacted by both gangliosides at high LPS dose, while Il-12p40 tended to increase with bovine GM3.
Conclusions: Human identical ganglioside C18 GM3, found in breastmilk, displays a stronger anti-inflammatory effect than bovine GM3 in human monocytes.

PD014 / #169

SMALL ELEMENTS, BIG IMPACT: ZINC AND VITAMIN D IN GROWTH

E-POSTER DISCUSSION 03: GENERAL NUTRITION AND GROWTH

Ana Kokhreidze
Tbilisi State Medical University, Endocrinology, Tbilisi, Georgia

Background and Aims: Micronutrient deficiencies affect approximately two billion people worldwide, the main cause of which is unhealthy nutrition. Despite the increasing attention of health professionals to healthy nutrition, the World Health Organization (WHO) estimates that micronutrient deficiencies are occurring at an alarming rate. Approximately 1.7 million (2.8%) of all deaths are caused by micronutrient deficiencies, making them among the top ten causes of global mortality. According to WHO, the most common deficiencies in living organisms, especially in children, are the following nutrients: iron (Fe), zinc (Zn), vitamin A, vitamin D, selenium (Se) and iodine (I).
The aim of the study was to determine the correlation between hypovitaminosis D and zinc deficiency with growth delay in Georgian children aged 3 to 10 years.
Methods: A case-controlled, single-center, clinical study was conducted that focused on the role of micronutrients, in particular vitamin D and zinc, in children's growth. The study included 226 children aged 3-10 years (mean age: 7.43 ± 2.21 years), the number of patients was practically evenly distributed by gender - 109 males (48.2%) and 117 females (51.8%).
Results: Stunting is associated with vitamin D and zinc deficiencies, which are exacerbated by deficiencies in both micronutrients ($p<0.0001$).
Conclusions: Both vitamin D and zinc concentrations positively correlated with physical development and negatively with body mass index, which indicates the important role of these micronutrients in healthy somatic growth.

PD015 / #367

THE DISPARITY BETWEEN ARTIFICIAL INTELLIGENCE AND CLINICAL EXPERTISE IN KETOGENIC DIET FORMULATION FOR CHILDREN WITH TYPE 2 DIABETES: A COMPARATIVE ANALYSIS

E-POSTER DISCUSSION 03: GENERAL NUTRITION AND GROWTH

Hilal Irem Ozdemir
Università degli studi piemonte orientale, Food, Health And Environment, Vercelli, Italy

Background and Aims: The increase in Pediatric Type2Diabetes indicates that,despite the potential metabolic benefits of the Ketogenic Diet, extremely careful planning is needed to maintain growth and development.Concurrently,the increasing use of Artificial Intelligence tools in diet planning requires rigorous evaluation.This study systematically compares KD formulations generated by AI tools with those developed by Dietitian,focusing on adherence to energy requirements,macronutrient distribution,and critical micronutrient adequacy.
Methods: Eight pediatric T2D cases were included.For each case, three KD plans were created:a reference diet by a Dietitian, ChatGPT-generated diet, and Gemini-generated diet.All diets were analyzed using the ASA24 dietary analysis system.Energy and nutrient values were compared against DRI/RDA standards using statistical tests.
Results: showed the Dietitian's diets closely matched energy targets,whereas ChatGPT approximated TDEE adequately, and Gemini exceeded requirements.Macronutrient profiles differed markedly: Gemini prescribed an extremely high-fat KD,the Dietitian provided a balanced KD/MAD transition diet,and ChatGPT yielded a high-protein, lower-fat pattern, compromising ketosis.Micronutrient analysis showed all diets fell short of Calcium targets for the 9–18 age group.VitaminD was excessive in ChatGPT diets yet insufficient in the Dietitian and Gemini plans.
Conclusions: This study substantiates that AI-based diet tools formulate ketogenic diet plans for Pediatric Type 2 Diabetes that are markedly heterogeneous and entail clinically significant risk.The severely constrained evidence regarding the implications for the ketogenic diet on long-term growth,metabolic integrity,and complications in children substantially undermines the clinical validity of these tools.Therefore,current AI models can't be considered a clinically credible substitute for Pediatric Ketogenic Diet planning,and all AI-generated diets necessitate oversight by dietitian to ensure energy macronutrient distribution and micronutrient adequacy.

PD016 / #798

TOWARD AN EVIDENCE-BASED DEFINITION OF "QUALITY GROWTH" ACROSS CHILDHOOD: RESULTS OF A MODIFIED DELPHI CONSENSUS

E-POSTER DISCUSSION 03: GENERAL NUTRITION AND GROWTH

Robert Murray[1], Pamela Almada[2], M. Julissa Angulo Barranca[3], Maria Catalina Bages Mesa[4], Rosa Acevedo[5], Praveen S Goday[6], Osiris M González[7], Miguel Angel Guagnelli[8], Kim Milano[9], Dan Nemet[10]
[1]The Ohio State University, Professor Of Pediatrics, Columbus, United States of America, [2]Centro Médico ABC, Campus Santa Fe, Ciudad de México, Mexico, [3]Clinica Anglo Americana, Pediatric Endocrinology, Lima, Peru, [4]Universidad El Bosque, Facultad De Medicina, Grupo Investigaciones Pediatricas Bosque, Bogotá, Colombia, [5]Central University of the East UCE Medical Center (CM-UCE), Department Of Pediatrics, Santo Domingo, Dominican Republic, [6]Nationwide Children's Hospital, Pediatric Gastroenterology & Nutrition; Director, Nutrition And Feeding Programs, Columbus, United States of America, [7]Hospital María and CADH Especialidades, Pediatric Gastroenterology, Tegucigalpa, Honduras, [8]Hospital Infantil de México Federico Gómez, Clinical Epidemiology Unit, Mexico City, Mexico, [9]North Central College, Department Of Health Science, Naperville, United States of America, [10]Meir Medical Center, Gray School of Medicine, Child Health And Sports Center, Tel Aviv, Israel

Background and Aims: While WHO and UNICEF provide established frameworks describing childhood growth and development, no globally accepted definition of *Quality Growth* exists as an independent concept. Establishing a scientifically grounded definition would offer clearer clinical guidance, improve pediatric care, and support future research.
Methods: A multidisciplinary group of global experts in child growth and development convened to define Quality Growth from infancy through adolescence. Experts completed a pre-meeting questionnaire assessing components identified through a structured literature review as potential contributors to growth. Responses were refined using a modified Delphi process.
Results: All 8 questionnaire respondents (100%) identified height as essential to a Quality Growth definition. Weight and body composition were supported by 88%, while proportional weight gain, bone health, and mid-upper arm circumference received 75% support. Nutritional adequacy received 50%, with several experts recommending it be considered a causal determinant rather than a defining component. During the Delphi discussions, experts highlighted the limitations of single time-point measures and emphasized the importance of growth velocity and proportionality to distinguish quality from quantity—representing a conceptual shift beyond traditional height- and weight-based indicators.
Conclusions: Experts defined **Quality Growth as proportional growth with appropriate body composition from infancy through young adulthood.** This dynamic, complex, multidimensional process provides a foundation for lifelong health and addresses the pediatric origins of adult disease.

PD017 / #387

EFFECT OF OCCASIONAL INFANT-FORMULA CO-FEEDING ON THE STOOL MICROBIOTA OF PREDOMINANTLY BREASTFED INFANTS

E-POSTER DISCUSSION 04: GUT MICROBIOME & BIOTICS

Evangelia Intze[1], Kristin Ritzenthaler[2], Christina Hecht[2], Hugues Piloquet[3], Monika Schaubeck[2], Ilias Lagkourvardos[1]
[1]University of Crete, Department Of Clinical Microbiology, School Of Medicine, Heraktlion, Greece, [2]HiPP GmbH und Co KG, R&d, Pfaffenhofen, Germany, [3]University Hospital of Nantes, Department Of Pediatric Chronic Diseases, Nantes, France

Background and Aims: Exclusive breastfeeding is the best nutrition for young infants. Human milk (HM) supports the gut microbiota and immune system development. While parents predominantly breastfeed, the occasional feeding of small amounts of infant formula (IF) is common. Limited data exist on minimal IF use affecting the microbiota of predominantly HM-fed infants. This study analysed the stool microbiome of a subgroup of predominantly HM-fed infants (pHM) compared to exclusively HM-fed infants (eHM) within the GOLF-III cohort (NCT02221687).
Methods: The GOLF-III cohort (a multicenter, double-blind, controlled synbiotic intervention trial) included a non-randomized HM-fed group. The protocol permitted feeding of up to one bottle of standard IF (without probiotics or prebiotics) daily. Feeding-mode was assessed using a 3-day food-diary. Microbiota composition was analysed at four months of age (16S rRNA amplicon sequencing).
Results: Analysis of food diaries indicated a pHM rate of 17.7% (9 of 51 HM-fed infants). There were no significant differences in microbiota composition, richness or diversity between pHM and eHM infants. While trends suggested higher abundance of *Bifidobacteriaceae* in eHM and higher *Bacteroidaceae* in pHM, no significant differences were observed at any taxonomic level.
Conclusions: This subgroup-analysis of a small sample of participants showed that up to one bottle of standard IF given occasionally, had no significant effects on the microbiome, although trends were observed. Since mixed-feeding of HM and IF is common practice, future study-setups should control for pHM-feeding within breastfed reference groups, to elucidate the potential effects of small, occasional amounts of IF on the infant stool microbiome.

PD018 / #382

MULTIMODAL MICROBIOME BIOINFORMATICS IDENTIFIES EARLY MICROBIAL MATURATION FAILURE AS A PREDICTIVE DRIVER OF CHILDHOOD LINEAR GROWTH FALTERING

E-POSTER DISCUSSION 04: GUT MICROBIOME & BIOTICS

Rini Winarti[1], Prihantini Prihantini[2], Sahnaz Vivinda Putri[3]
[1]Yogyakarta State University, Biology, Sleman, Indonesia, [2]IMCDS-BioMed Research Foundation, Ai-biomedicine Research Group, Jakarta, Indonesia, [3]Indonesia Open University, Management, Makassar, Indonesia

Background and Aims: Gut microbiome maturation shapes nutrient harvest, barrier integrity, and linear growth, but clinically informative microbial biomarkers capable of forecasting growth faltering remain poorly defined. This study aimed to develop a mechanistically informed bioinformatics framework that identifies functional microbial signatures predicting linear growth decline before anthropometric deterioration, enabling precision-nutrition triage during the first 1,000 days.
Methods: We integrated two open-access pediatric microbiome datasets: infant shotgun metagenomes from the SHINE cohort and 16S–SCFA profiles from Indonesian toddlers with stunting and normal growth (NCBI BioProject PRJNA1065733). Analyses used HUMAnN3, MetaPhlAn4, QIIME2, and XGBoost. Microbiome-for-age Z-scores (MAZ) were generated, and longitudinal associations with ΔLAZ modeled using mixed-effects regression adjusted for sex, breastfeeding, HIV exposure, and household WASH/IYCF indicators. Functional pathways (butyrate synthesis, B-vitamin biosynthesis, mucin degradation) were quantified, and SCFA incorporated using elastic-net regression to refine mechanistic interpretation.
Results: A 1-unit lower MAZ at 3 months predicted >0.5 SD LAZ decline by 12 months (adjusted OR 2.21; 95% CI 1.64–2.97). Butyrate-pathway depletion (−36%) and reduced B-vitamin biosynthesis (−27%) explained 43% of ΔLAZ variance ($p<0.001$). Independent toddler validation showed 40% lower butyrate, 32% higher Proteobacteria, and +28% mucin-degrading pathway enrichment among stunted children, confirming cross-population biological consistency and indicating diminished microbial metabolic resilience during critical growth windows. The fused XGBoost model achieved AUROC 0.853, yielding a +18.7% improvement in early stunting risk classification.
Conclusions: Across two distinct populations, early microbial maturation failure precedes linear growth decline and identifies functional biomarkers, particularly butyrate and B-vitamin pathways, that support a clinically interpretable precision-nutrition strategy for early identification of high-risk infants.

PD019 / #424

HUMAN MILK OLIGOSACCHARIDES AND GROWTH TRAJECTORIES AMONG HIV-EXPOSED UNINFECTED AND HIV-UNEXPOSED CHILDREN IN KENYA

E-POSTER DISCUSSION 04: GUT MICROBIOME & BIOTICS

Christine J Mcgrath[1], Wenwen Jiang[1], David Taylor Hendrixson[2], Ruchi Tiwari[1], Prisca Lihanda[3], Charles Mutinda[3], Eric Ochola[3], Chloe Yonemitsu[4], Grace John-Stewart[1], Lars Bode[4], Benson Singa[3], Grace Aldrovandi[5]

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Background and Aims: Human milk oligosaccharides (HMOs), the third largest solid component in breastmilk, influence gut microbiome development. Children HIV-exposed and uninfected (CHEU) are at higher risk of growth faltering than children HIV-unexposed (CHU), yet it is unclear whether HMOs contribute to these differences. We examined associations between HMOs and growth outcomes in CHEU and CHU through two years of life.

Methods: Absolute HMO concentrations were measured in milk collected after full breast expression at 6-weeks postpartum from 329 women (169 with HIV; 160 without HIV) in a Kenyan cohort. Associations between HMOs and weight-for-age (WAZ), length-for-age (LAZ), and head-circumference-for-age (HCAZ) z-scores from 6 weeks to 24 months were assessed using mixed-effect models adjusting for maternal age, MUAC, anemia, parity, secretor status, HIV status, and birth growth z-score, with Benjamini-Hochberg correction $p<0.20$ significant.

Results: Most mothers (88%) were secretors; 9% of infants were preterm, 6% low birthweight. Half (55%) were exclusively breastfed for 6 months, and 84% of CHEU and 91% of CHU were breastfeeding at 12 months ($p<0.001$). Overall, higher LNFP-III and LSTb concentrations were associated with significantly lower WAZ, LAZ, and HCAZ. Elevated 3'SL, DFLac, and DFLNT were associated with lower WAZ and HCAZ, and elevated LNFP-I was associated with lower LAZ. In stratified analysis among CHU, findings of LNFP-I/III and LSTb remained the same. No HMOs were associated with growth among
CHEU.

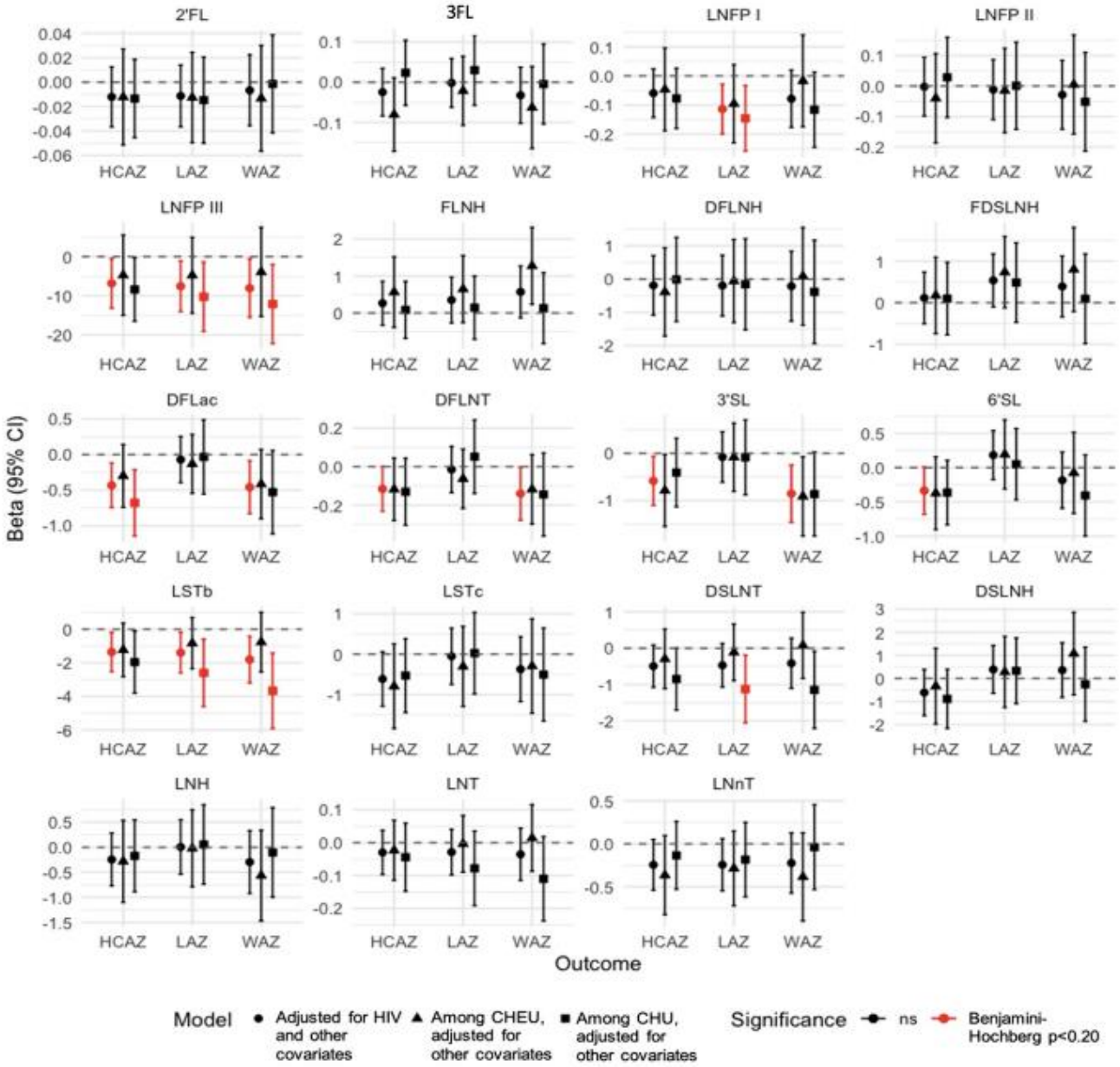

Figure. Coefficients of HMO concentrations and growth outcomes from 6 weeks to 24 months in Kenyan children HIV exposed uninfected (CHEU) and HIV-uninfected (CHU). Red denotes that the Benjamini-Hochberg corrected *P*-value is significant at p<0.20. HCAZ, head circumference-for-age z-score; LAZ, length-for-age z-score; WAZ, weight-for-age z-score; DFLac, difucosyllactose; DFLNH, difucosyllacto-N-hexaose; DFLNT, difucosyllacto-N-tetrose; DSLNH, disialyllacto-N-hexaose; DSLNT, disialyllacto-N-tetraose; FDSLNH, fucodisialyllacto-N-hexaose; FLNH, fucosyllacto-N-hexaose; LNFP I/II/III, lacto-N-fucopentaose-I/II/III; LNH, lacto-N-hexaose; LNnT, lacto-N-neotetraose; LNT, lacto-N-tetrose; LSTb/c, sialyl-lacto-N-tetraose b/c; 2'FL, 2'-fucosyllactose; 3FL, 3-fucosyllactose; 3'SL, 3'-sialyllactose; 6'SL, 6'-sialyllactose.

Conclusions: HMOs may influence early growth, with differential effects by HIV exposure. Understanding mechanisms linking HMOs, gut microbiota, and HIV exposure is critical to inform interventions to optimize child growth.

PD020 / #552

MATERNAL PRE-PREGNANCY BMI DIFFERENTIALLY SHAPES MICROBIOME-GUT-BRAIN AXIS DEVELOPMENT & NEUROCOGNITIVE OUTCOMES IN CHILDREN AT 6 YEARS OLD. THE PREOBE FOLLOW-UP STUDY

E-POSTER DISCUSSION 04: GUT MICROBIOME & BIOTICS

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Background and Aims: We examined the relationships among maternal pre-pregnancy (BMI), offspring neurocognitive performance, brain cortical morphology, and gut microbiome in 6-years-old children participating in the PREOBE study.
Methods: At 6 years, children were classified according to maternal BMI as Normal-weight (NW; 18≤BMI<25; n=78) or Overweight/Obese (OW+OB; BMI≥25; n=67).
Results: Children of OW+OB mothers exhibited poorer neurocognitive outcomes {Kaufman Brief Intelligence Test (K-BIT)}. Vertex-wise cortical analyses using the QDECR pipeline revealed significant associations between K-BIT measures (vocabulary, IQ, abstract reasoning) and cortical regions, with distinct spatial patterns between groups. Gut microbiome β-diversity also differed significantly between groups, with metadata variables explaining variance differentially. Integrated multimodal analyses identified group-specific associations between microbial taxa and cortical regions. In 6-years-old children of NW mothers, Mitsuokella, Ligilactobacillus, and Collinsella were negatively associated with the lh-inferiortemporal and rh-inferiorparietal areas. In OW+OB children, Roseburia, Fusicatenibacter, and Faecalibacterium were negatively associated with the lh-middletemporal and rh-inferiorparietal areas, whereas Cuneatibacter and Coprobacillus were positively associated with the lh-middletemporal and rh-superiorparietal areas. Partial correlations linked gut taxa to neurocognitive measures: reaction time in children of NW mothers correlated positively with Fusicatenibacter, Ligilactobacillus, Mitsuokella, and Sutterella; in children of OW+OB mothers, abstract reasoning correlated negatively with Mitsuokella and Neglecta, and visual-motor errors correlated negatively with Senegalimassilia.
Conclusions: These findings underscore maternal pre-pregnancy BMI as a key determinant of child neurodevelopment and identify the gut microbiome as a potential mediator within the “gut–brain axis”, offering targets for early-life interventions. Funding: Andalusian Government, Economy, Science

& Innovation Ministry (PREOBE Excellence Project-P06-CTS-02341) and DynaHEALTH H2020 EU Project, GA nº:633595.

PD021 / #743

EFFECTIVENESS OF THE SYNBIOTICS IN THE TREATMENT OF GASTROINTESTINAL DISEASES WITH ANTIBIOTICS

E-POSTER DISCUSSION 04: GUT MICROBIOME & BIOTICS

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Background and Aims: Gastrointestinal (GI) diseases in children are still a relevant and global problem in the contemporary world. About 22% of children worldwide have GI diseases. However, dysbiosis can result from factors such as medications, infections, aging, lifestyle, surgery, malnutrition, and allergies. In humans, a range of acute and chronic disorders can be a consequence of perturbation of gut microbial communities
Methods: Our study aimed to investigate the use and effectiveness of synbiotics in the treatment of gastrointestinal diseases with antibiotics in the pediatric population. We studied 50 patients who had a toxic state caused by Clostridium difficile and 50 patients who had Helicobacter pylori. (Total 100 patients). 86% of 100 patients had moderate diarrhea, and 14% of 100 patients had severe diarrhea. Patients were assessed according to clinical signs: frequency of defecation, stool consistency, presence of pathological impurities, flatulence, and sleeplessness
Results: In patients who had Helicobacter pylori infection (Total=50) after treatment with synbiotics, they had reduced diarrhea (89%), the quality of sleep improved (79%), and reduced presence of pathological impurities (84%).In patients who had a toxic state caused by Clostridium difficile (Total=50) after treatment with synbiotics, they had reduced diarrhea (82%), the quality of sleep improved (54%), and reduced presence of pathological impurities (73%). Laboratory research in the study contingent showed that after treatment, the number of patients with normal microflora increased from 6% to 59%
Conclusions: Use of probiotics and prebiotics is justified by robust assessments of efficacy, but not all products have been validated; the goal is evidence-based use by healthcare professionals.

PD022 / #153

BOVINE COLOSTRUM AS A HUMAN MILK FORTIFIER FOR VERY PRETERM INFANTS WITH SLOW FEEDING ADVANCEMENT

E-POSTER DISCUSSION 05: INFANT AND CHILD NUTRITION

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Background and Aims: Fortification of human milk for very preterm infants (VPIs) with alternatives to conventional fortifier remains minimally studied. This trial tested whether fortification with protein-rich bovine colostrum (BC) improves feeding intolerance and clinical variables in VPIs receiving enteral nutrition with a relatively slow advancement.
Methods: In this unblinded, two-centre, randomised, controlled trial (FortiColos CN), VPIs (gestational age, 26+0 to 31+6 weeks) were fed human milk fortified with BC (n = 74) or a conventional fortifier (CF, n = 72) for at least two weeks, starting when enteral feeding volume reached 80-100 mL/kg body weight/d. Incidence of feeding intolerance, nutrition intake, body growth, morbidities and clinical biochemical parameters were compared between two groups.
Results: No significant difference was found in gestational age, body weight and anthropometrics at birth. No statistically significant difference was found in the incidence of feeding intolerance or in most of the nutritional or body growth parameters ($p > 0.05$). All recorded morbidity incidences, and haematological and blood biochemical parameters were also similar between groups. Amino acids (Phe, Pro, Ser, Tyr, Val) showed higher levels in the infants receiving BC.
Conclusions: BC appeared safe when used as fortifier to human milk for VPIs with slow feeding advancement but did not improve feeding tolerance or clinical variables, suggesting that modifications to the composition of the BC product and additional supplementation may be required.

PD023 / #440

GROWTH PATTERNS AT 0-6 YEARS OF AGE IN CHILDREN WITH COELIAC DISEASE – A LONGITUDINAL REAL WORLD DATA STUDY IN SWEDEN

E-POSTER DISCUSSION 05: INFANT AND CHILD NUTRITION

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Background and Aims: Deviating growth patterns in children can be a symptom of coeliac disease (CD). Knowledge of growth of a total real world data childhood population is scarce. The aim of the study was to investigate the occurrence of potential growth deviations, associated with CD, at what age deviations occurred related to date of diagnosis and whether there were differences between the sexes in preschool Swedish children.
Methods: Weight and height were gathered from the Regional Healthcare Information Platform (RHIP) in the Region Halland, Sweden, including children registered January 2009 to December 2022, with a diagnosis of CD. Descriptive statistics were performed.
Results: 121 (65.4%) of the children with CD were girls and 64 (34.6%) boys. The negative growth deviations were highest at diagnosis; mean -0.54(±1.2) weight standard deviation score (weight-SDS), -0.48(±1.1) height standard deviation score (height-SDS), with no significant differences between the sexes. More pronounced growth deviations were seen in children diagnosed at 36-48 months of age compared to other age groups. Significant improvement in growth for weight-SDS and height-SDS were seen between diagnosis and 2 years after diagnosis.
Conclusions: The significant differences at the measurement points in proximity to diagnosis indicated differences in growth depending on age of CD diagnosis. Catch up growth was seen 2 years after diagnosis. Practical implications are that it is possible to observe negative growth deviations years before CD diagnosis, by growth-monitoring.

PD024 / #401

GUT AND BRAIN DEVELOPMENT AFTER MILK FAT GLOBULE MEMBRANE SUPPLEMENTATION TO PRETERM PIGS FED HUMAN DONOR MILK

E-POSTER DISCUSSION 05: INFANT AND CHILD NUTRITION

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Background and Aims: Milk fat globule membranes (MFGMs) are rich in bioactive components that may support gut, immune and brain development in newborns. This could be important when feeding donor human milk (DHM) to preterm infants. Using preterm pigs as a sensitive model, we investigated effects of MFGM supplementation to DHM.
Methods: Preterm pigs (90% gestation) were randomized to DHM containing 100 g/L of an MFGM-enriched product (Lacprodan MFGM-10, Arla Foods Ingredients, MFGM-DHM, n= 23) or DHM with equal levels of nutrients from whey protein isolate (WPI-DHM, n=24). Clinical and intestinal parameters were recorded. All pigs were euthanized on day 5 and gut and brain tissues were collected for further analyses.
Results: The body weight gain percentage from birth to euthanasia was higher in MFGM-DHM pigs compared with WPI-DHM pigs (+25.6% versus +22.1%, P = 0.001). The incidence of clinical symptoms, intestinal sugar absorption and relative organ weights (g/kg body weight) were similar between the groups. The severity of pathological lesions in the small intestine did not differ between the groups. MFGM supplementation increased the expression of *MBP,*
MOG, *OPALIN* and *GAP43* genes in the prefrontal cortex (P <0.05).
Conclusions: The results suggest that supplementing MFGM to DHM is clinically safe in sensitive, preterm pigs, even at a very high dose. It improves body weight gain and increases the expression of genes associated with oligodendrocyte maturation, myelination and neuronal plasticity, but without notable effects on gut development.

PD025 / #107

A DIGITAL WINDOW INTO LACTOGENESIS: HUMAN MILK CONDUCTIVITY AS A BIOMARKER OF BREASTFEEDING SUCCESS"

E-POSTER DISCUSSION 06: FEEDING, HEALTH & BIG DATA

Daniela Abigail Navarro
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Background and Aims: Background and Aims
Secretory activation delays are a leading cause of insufficient milk supply and early breastfeeding cessation. Human milk sodium concentration, reflected by conductivity, is a key biomarker of lactogenesis progress. A novel handheld device was developed to provide real-time, non-invasive milk conductivity measurement at home. This study aimed to validate the device against laboratory standards and explore its potential clinical utility in detecting lactation difficulties.
Methods: Methods
We conducted a retrospective analysis of 227 milk specimens and extensive laboratory quality assurance tests. Device performance was evaluated for precision, reproducibility, and stability using standard KCl solutions and human milk specimens. Agreement between device-derived Milk Maturation Percentage (MM%) and laboratory sodium concentrations was assessed through regression and Bland–Altman analyses.
Results: Results
The device demonstrated excellent reproducibility (ICC >0.90), accuracy (error <5%), and long-term stability. Conductivity results showed almost perfect correlation with laboratory measures of sodium (R^2 >0.9, p<0.001). MM% differentiated between mothers with normal and delayed lactogenesis, with predictive values exceeding 90% when compared to the established sodium threshold (18 mmol/L) for secretory activation. Real-world pilot data confirmed usability in home settings, with dynamic MM% tracking aligned with breastfeeding progress and infant growth.
Conclusions: Conclusions
This study validates the device as a reliable, user-friendly tool for monitoring lactogenesis at home. By providing mothers and healthcare providers with objective, real-time data, it offers an opportunity for earlier identification of breastfeeding challenges, personalized interventions, and ultimately, enhanced breastfeeding success.

PD026 / #150

EXPLORING THE ASSOCIATION BETWEEN EATING HABITS, PHYSICAL ACTIVITY, CHRONOTYPE, AND COGNITIVE WELL-BEING: ATHEORETICAL MODEL FOR UNIVERSITY STUDENTS

E-POSTER DISCUSSION 06: FEEDING, HEALTH & BIG DATA

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Background and Aims: University students often experience stress and burnout, which can impact their mental health and well-being. Eating habits are an essential modifiable lifestyle risk factor that associates with mental and emotional health. However, its interplay with physical activity and chronotype on impacting subjective cognitive well-being remains underexplored in educational settings. This study aims to explore these lifestyle risk factors as potential predictors of subjective cognitive well-being among undergraduate university students from Oman.
Methods: In this cross-sectional study, disordered eating was measured using the 26-item Eating Attitude Test (EAT-26). Physical activity levels and chronotypes were assessed using the International Physical Activity Questionnaire (IPAQ) and the Morning and Evening Questionnaire-5 Items (MEQ-5). Subjective cognitive well-being and sociodemographic factors were also evaluated. Structural Equation Modelling (SEM) was employed to hypothesize an association model of the three factors as predictors of subjective cognitive function.
Results: The study included 408 students with a mean age of 20.21±1.57 years (females, 74.3%). Disordered eating was observed in 28.4% of participants. 52.3% were physically active, and 34.1% were classified as evening chronotypes. Using SEM, disordered eating attitudes did not directly predict subjective cognitive status (β=0.015, p=0.115); however, it showed a positive association with physical activity (β=0.10, p=0.047). Conversely, physical activity (β=0.151, p=0.005) and chronotype (β=0.027, p=0.046) significantly predicted subjective cognitive status.
Conclusions: Disordered eating habits showed a direct effect on physical activity levels, which significantly predicted subjective cognitive status. Addressing these factors by integrative interventions such as promoting physical activities and aligning academic routines with individuals' chronotypes could support students' overall well-being.

PD027 / #256

CORRELATION BETWEEN FOOD-RELATED ONLINE CONTENT MEDIA AND DIETARY PATTERNS OF HEALTH SCIENCES AND ALLIED HEALTH STUDENTS AT UNIVERSITY OF THE EAST RAMON MAGSAYSAY MEDICAL CENTER

E-POSTER DISCUSSION 06: FEEDING, HEALTH & BIG DATA

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Background and Aims: Social media strongly influences eating behaviors, with food-related content (e.g., eating videos, cooking tutorials, and reviews) shaping perceptions of food and diet. Health sciences and allied health students represent a crucial public health population, as their dietary behaviors and media literacy may influence their future clinical practice and patient education. This study examined the correlation between food-related media exposure and dietary patterns among health sciences students at UERM Medical Center.
Methods: A descriptive correlational design with convenience sampling was used among 334 students. Participants completed a self-administered online questionnaire assessing frequency, duration, purpose, and platform of food-related media exposure, alongside validated tools measuring binge eating, frequent cravings, unhealthy food consumption, and restrictive eating. Spearman's rank-order correlation was used for analysis ($p < 0.05$).
Results: Frequency of exposure correlated significantly but weakly positive with binge eating ($r = 0.107$, $p = 0.0499$) and frequent cravings ($r = 0.165$, $p = 0.0024$). Duration of exposure correlated significantly but weakly positive with binge eating ($r = 0.132$, $p = 0.0157$), frequent cravings ($r = 0.172$, $p = 0.0016$), and unhealthy food consumption ($r = 0.123$, $p = 0.0242$). Restrictive eating was not significantly associated with exposure.
Conclusions: Prolonged frequency and duration of exposure to food-related content media modestly increase appetitive behaviors among health sciences students. Integrating digital health literacy and media education into health sciences curricula may help mitigate social media's subtle influence on eating patterns and promote healthier dietary awareness among future healthcare professionals.

PD028 / #723

CHALLENGES IN FEEDING AND DIGESTION AMONG CHILDREN WITH AUTISM SPECTRUM DISORDERS AND CEREBRAL PALSY IN BULGARIA

E-POSTER DISCUSSION 06: FEEDING, HEALTH & BIG DATA

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Background and Aims: Feeding and digestive challenges in children with ASD and CP are common and multifactorial. In **CP**, feeding difficulties are frequently due to impaired oral-motor coordination, dysphagia, prolonged feeding times, gastrointestinal motility problems. In ASD, feeding problems are characterized by food selectivity, mealtime behavioral issues, sensory sensitivities, and a high prevalence of gastrointestinal symptoms. Ongoing monitoring for nutritional status is needed to prevent complications and support growth and development.The study aims to assess the feeding and gastrointestinal challenges among ASD and CP popullation in NorthEastern Bulgaria.
Methods: A cross-sectional study of 146 children (ASD:n=102,CP:n=44) analyzed demographic characteristics, GI symptoms, food preferences, and selffeeding skills. Group comparisons were conducted using cross-tabulation and Fisher's exact test in Jamovi v2.6.17, with statistical significance set at $p<0.05$.
Results: The mean age of children with ASD is 6.56±2.52 years, while that of children with CP is 6.06±3.00 years. Self-feeding difficulties were reported in 39.6% of participants, and food aversion in 54%, with higher rates in ASD. Most children with CP preferred mushy food, while 64.8% of those with ASD favored crunchy textures ($p<0.001$); mushy food preference was also linked to severe disability (63.2%,$p<0.006$). Taste preferences were more marked in ASD versus CP.
Conclusions: The specific features related to the feeding process in children with cerebral palsy and autism may pose a risk factor for malnutrition. Understanding feeding challenges and preferences can help families and healthcare professionals better address gastrointestinal difficulties and improve overall quality of life in these vulnerable populations.

PD029 / #756

ASSOCIATIONS BETWEEN HYPER-PALATABLE FOOD CONSUMPTION AND DIET QUALITY AMONG U.S. CHILDREN, NHANES 2013–2018

E-POSTER DISCUSSION 06: FEEDING, HEALTH & BIG DATA

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Background and Aims: Hyper-palatable foods (HPFs) have been consistently associated with overeating and obesity in adults, yet their relevance for children has been insufficiently explored. Diet quality represents an early, modifiable indicator for nutritional risk in childhood, preceding overt cardiometabolic outcomes. This study evaluated associations between HPF intake and the Healthy Eating Index (HEI-2015) among U.S. children.
Methods: Analyses included 9,630 participants (≤18 years) from NHANES 2013–2018. Two 24-hour recalls were used to estimate HEI-2015 scores (0–100) and HPF intake (% daily energy). HPF was defined per Fazzino et al. (2019) based on thresholds of fat, simple sugars, sodium, and refined carbohydrates. Group differences across HPF quartiles were tested with chi-square and ANOVA. Survey-weighted, multivariable linear regression estimated associations between HPF intake and HEI-2015 scores, adjusting for age, ethnicity, income, education, and total energy intake.
Results: HPFs accounted for nearly two-thirds of daily energy intake (mean 64.9%) and mean HEI-2015 score was 50.2. Children in higher HPF quartiles were older, had higher household income and education, higher energy intake, and lower HEI-2015 scores. Higher HPF intake was associated with lower HEI-2015 scores in unadjusted ($\beta = -0.326$, SE = 0.020, $p<0.0001$) and fully adjusted models ($\beta = -0.294$, SE = 0.039, $p<0.0001$), corresponding to an approximate 3-point lower HEI-2015 score per 10% higher energy intake from HPFs.
Conclusions: HPFs account for a substantial proportion of energy intake among U.S. children and are associated with meaningful differences in diet quality, supporting the relevance of HPF consumption as an interpretable dietary construct in pediatric nutrition research.

PV001 / #540

TELEMEDICINE SATISFACTION AND NUTRITIONAL STATUS IN CHILDREN WITH NEUROLOGICAL IMPAIRMENT: PRELIMINARY FINDINGS FROM A MULTIDISCIPLINARY APPROACH

BIG DATA & ARTIFICIAL INTELLIGENCE (AI)

Francesca Eletti[1,2], Giulia Fiore[1,2], Barbara Borsani[1], Veronica Perico[1,2], Eliana Elisabetta Perna[1], Alessandra Bosetti[1], Sara Vizzuso[1], Elvira Verduci[1,3], Gianvincenzo Zuccotti[1,2]
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Background and Aims: Telemedicine is an essential tool for maintaining continuity of care in children with neurological impairment, helping reduce travel burden and improving access to specialized services. Despite the growing implementation of telemedicine, parent-reported satisfaction and its

determinants remain insufficiently explored

Methods: Parent-completed satisfaction questionnaires related to telemedicine visits were collected from 43 pediatric patients with neurological diseases (i.e. neuromuscular/neurodegenerative diseases, leukodystrophies, and cerebral palsy). All patients regularly attend in-person clinical assessments and telemedicine follow-up every 2–3 months. Telemedicine satisfaction was classified into four levels. Nutritional status was categorized according to WHO growth references BMI z-scores into: Undernutrition (risk/mild, moderate, severe), Normalweight, Overweight. Associations between total satisfaction score and variables such as travel cost, diagnosis, and geographical distance were examined through linear regressions

Results: Telemedicine satisfaction was generally high, with 60.5% good, 32.6% excellent, 4.7% moderate, and 2.3% low satisfaction (Figure 1). Approximately 45% of the enrolled children presented moderate-to-severe undernutrition (UN), and only 25% were normal weight (Figure 2). Regression analysis between satisfaction and travel cost showed a statistically significant association ($p<0.0001$), indicating that families facing higher expenses tend to value telemedicine more. In contrast, geographical distance was not a predictor of satisfaction (Figure 3).

Figure 1 TLM Satisfaction

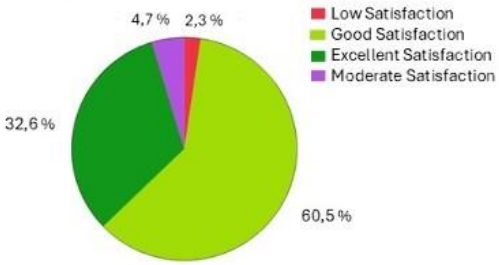


Figure 2 Malnutrition (BMI Z score)

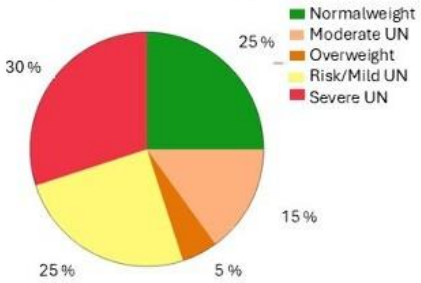
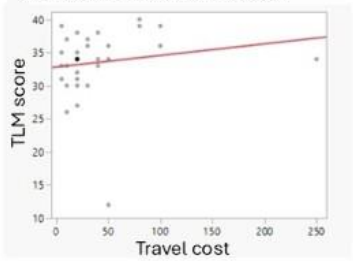


Figure 3 Regression analyses showing association between travel cost and satisfaction



Conclusions: These preliminary findings, from a cohort of pediatric patients with neurological impairment, indicate high family satisfaction with telemedicine. The notable prevalence of severe nutritional impairment underscores the importance of integrating nutritional assessment into telemedicine pathways. Further studies with larger cohorts are needed to better characterize factors shaping satisfaction and optimize remote care models

PV002 / #446

MACHINE-LEARNING QUANTIFICATION OF A GLOBAL NUTRITION SOVEREIGN RISK PREMIUM LINKING CHILD GROWTH FAILURE TO ELEVATED NATIONAL BORROWING COSTS

BIG DATA & ARTIFICIAL INTELLIGENCE (AI)

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Background and Aims: Child growth failure impairs education, productivity, and lifetime earnings, but its fiscal impact remains unclear, and no analysis has examined whether growth failure is priced in sovereign borrowing costs. We quantified a Nutrition Sovereign Risk Premium (NSRP), the share of debt costs attributable to child growth failure, using multi-country datasets to assess fiscal space, interest burdens, and debt trajectories.
Methods: We integrated 2000–2023 stunting, wasting, and overweight estimates from UNICEF–WHO–World Bank Joint Child Malnutrition Estimates with World Bank WDI data and NYU Stern sovereign default spreads. A human-capital loss function was derived from evidence linking each 1-SD lower HAZ to −6.2% (95% CI −4.8 to −7.9) adult wages. Productivity, tax-base erosion, and debt/GDP paths through 2050 were modeled, and an elastic-net ML approach predicted sovereign spreads under (1) actual and (2) counterfactual scenarios where stunting remained <10% since 2000. NSRP was defined as the spread difference attributable to child growth-failure distributions after adjustment for GDP, governance, inflation, and debt metrics.
Results: Across 111 countries, NSRP contributed a median 38 bp (IQR 22–61) of sovereign spreads, equivalent to USD 4.8B/year in excess interest payments. High-burden countries (stunting >30%) showed 71 bp higher predicted spreads (95% CI 49–96) after adjustment for macro-structural covariates. Counterfactual stunting <10% produced 3.4–6.8 percentage-point lower debt/GDP by 2050 and IRR 24–31% when comparing nutrition-program costs with cumulative gains from higher GDP and reduced borrowing costs.
Conclusions: Early-life growth failure materially increases sovereign borrowing costs. NSRP integration indicates that nutrition investments operate as macro-fiscal stabilizers, expanding fiscal space while improving child health.

PV003 / #451

BAYESIAN MACHINE LEARNING STRESS TESTING OF CHILDHOOD OBESITY AS A DRIVER OF FUTURE NONCOMMUNICABLE DISEASE COSTS AND NATIONAL DEBT DISTRESS RISK

BIG DATA & ARTIFICIAL INTELLIGENCE (AI)

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Background and Aims: Childhood obesity elevates later noncommunicable disease risk, but its broader fiscal impact remains unclear. No analysis has examined whether rising childhood adiposity increases future health spending and debt-distress risk. We aimed to develop a causal macro-fiscal stress test estimating obesity-driven noncommunicable disease burden through 2050 and its effects on fiscal space, interest-payment pressure, and sovereign debt trajectories.
Methods: We merged obesity data from UNICEF–WHO–World Bank estimates and WHO Health Observatory with disease burden and BMI-attributable disability-adjusted life years from the Global Burden of Disease study. Health expenditure and debt metrics came from the Global Health Expenditure Database, World Bank data, and International Monetary Fund. A Bayesian hierarchical model linked obesity to noncommunicable disease burden, and double machine learning estimated the causal effect of obesity-attributable spending on the primary fiscal balance. These effects fed a stochastic debt model with 10,000 Monte Carlo simulations (2025–2050) under international sustainability thresholds.
Results: Across 141 countries, each 1-percentage-point rise in childhood obesity predicted 4.3% higher high body mass index–attributable disability-adjusted life years (95% CI 3.1–5.6) and 0.12% GDP additional noncommunicable disease spending. This reduced the primary fiscal balance by 0.08% GDP (95% CI 0.05–0.11). Stress testing showed obesity-related fiscal pressure increased projected 2050 debt-distress probability from 19% to 31%, with debt-to-GDP paths 5.4–8.2 points higher. Prevention scenarios lowered long-term debt ratios by 3.1–4.7 points, yielding fiscal internal rates of return of 21–29%.
Conclusions: Childhood obesity is a macro-critical driver of future noncommunicable disease costs and national debt vulnerability. Prevention offers high fiscal returns and strengthens long-term national stability.

PV004 / #672

CAFFEINE AND THE ADOLESCENT ENDOCRINE AXIS: A COMPREHENSIVE REVIEW OF METABOLIC AND HORMONAL DISRUPTION

CHILDHOOD & ADOLESCENCE

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Background and Aims: Caffeine is the most widely used psychoactive substance among adolescents, commonly consumed through energy drinks, coffee, tea, and sodas. Although it is socially accepted and accessible, excessive intake during adolescence—a key period for hormonal maturation, skeletal growth, and metabolic programming—may negatively influence endocrine function. Recent evidence suggests caffeine can interfere with calcium metabolism, the hypothalamic-pituitary axis, sleep regulation, and insulin sensitivity Aim: to review impact of caffeine intake on growth and the endocrine system
Methods: A review of studies from 1998 to 2024 identified observational, randomized, and experimental research examining caffeine exposure in adolescents under 19 years of age. Ten major studies met inclusion criteria, assessing caffeine dose and endocrine or metabolic outcomes.
**Results: Ten studies included. High caffeine intake was associated with: ↓ Calcium absorption (10%) and ↓ bone accrual (5%), likely due to impaired vitamin D receptor activity and increased urinary calcium excretion. ↑ Cortisol (40%) via HPA axis stimulation, leading to stress-related hormonal imbalance. ↓ fT3 levels (18%), potentially impairing metabolic rate and thermogenesis. ↓ Melatonin secretion (30%), contributing to sleep-phase delay and secondary endocrine dysregulation. ↓ Reproductive hormones (20%) through suppression of the GnRH–LH/FSH axis, potentially delaying puberty. ↓ Insulin sensitivity (15%), increasing the risk for metabolic syndrome. ↓ Adrenal steroidogenesis (25%) in preclinical models, suggesting impaired stress hormone
production.**

Endocrine Effect	Proposed Mechanism	Supporting Evidence
Reduced Calcium Absorption	Caffeine increases urinary calcium excretion and reduces intestinal calcium absorption by antagonizing vitamin D receptor-mediated pathways.	Heaney et al. (1998), Sun Pediatrics (2022)
Decreased Bone Accrual	Chronic caffeine exposure during adolescence may interfere with bone remodeling via reduced calcium availability and possible osteoblast inhibition.	Lloyd et al. (1998), MDPI Animal Study (2023)
Elevated Cortisol	Caffeine stimulates the hypothalamic-pituitary-adrenal (HPA) axis, increasing CRH and ACTH → elevated cortisol secretion.	Energy Drink Studies (2024), Environmental Review (2023)
Altered Thyroid Function	Chronic caffeine use may suppress conversion of T4 to T3 (↓fT3), possibly via hepatic enzyme modulation or stress axis interference.	Caffeine-Thyroid Study (2023)
Disrupted Melatonin Secretion	Caffeine delays melatonin onset by antagonizing adenosine receptors in the pineal gland → disrupted sleep-wake cycle.	Endocrine Abstracts (2024), Environmental Review (2023)
Suppressed Reproductive Hormones	Excess caffeine may inhibit GnRH and LH/FSH release indirectly via elevated cortisol and sleep disruption, impairing puberty progression.	Environmental Factors Review (2023), Psychiatry Advisor (2025)
Insulin Resistance	High caffeine may impair insulin sensitivity by increasing epinephrine and cortisol, both of which antagonize insulin action.	Energy Drink Study (2024)
Adrenal Development Impairment	In animal models, chronic caffeine exposure suppresses adrenal cortical development, reducing corticosterone production.	MDPI Nutrition Rat Study (2023)

Conclusions: Excessive adolescent caffeine intake disrupts bone, sleep, reproductive, and metabolic hormones, warranting screening, regulation of energy drinks, and public health awareness.

PV005 / #730

THE IMPACT OF SIROLIMUS THERAPY ON GROWTH PARAMETERS IN PEDIATRIC PATIENTS WITH COMPLEX VASCULAR ANOMALIES

CHILDHOOD & ADOLESCENCE

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Background and Aims: Sirolimus has both effects on reducing vessel ectasia as well as the inflammation that causes significant pain. This response has been best seen in lymphatic and venous anomalies. Therefore, this study investigates the impact of sirolimus on growth parameters in pediatric patients with complex vascular anomalies.
Methods: This retrospective study was conducted at the King Faisal Specialist Hospital and Research Centre in Riyadh, Saudi Arabia. The study included 75 pediatric patients aged from birth to 21 years who received continuous sirolimus treatment for at least six months. Growth parameters were evaluated by comparing measurements at the initial presentation to those at the last follow-up during data collection.
Results: Among the 75 patients (42.7% females, 57.3% males), the mean age was 10.4 ± 5.3 years. Notably, sirolimus treatment did not show negative impact on height (116.9 to 135.8 cm) nor weight (28.9 to 38.6 kg) ($p = 0.000$). A median dose of 1.5 mg/m2 and a treatment duration of 2 years improved clinical outcomes in (97.3%) of participants.
Conclusions: This study highlights the importance of monitoring growth parameters in pediatric patients undergoing sirolimus therapy for vascular anomalies. Sirolimus not only effectively addresses these anomalies but also did not appear to negatively impact height or weight in pediatric population with vascular anomalies, and their growth seemed to follow the norm pattern of the Saudi growth chart. As an off-label application, sirolimus presents a promising avenue for improving patient outcomes while minimizing the need for surgical interventions.

PV006 / #338

THE INFLUENCE OF GENDER NORMS ON ADOLESCENT DIETARY PATTERNS IN INDONESIA

CHILDHOOD & ADOLESCENCE

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Background and Aims: Previous evidence suggested the influence of gender norms (i.e., gender-related norms, behaviours and practices) on dietary behaviours, but little is known within the context of Indonesian adolescents. This study aimed to explore how gender norms influence Indonesian adolescent dietary patterns.
Methods: Qualitative research was conducted at both the national and local levels, covering Indonesia's four districts: Cilegon, Bogor, West Bandung, and Kupang. Using a purposive sampling technique, data were collected from central and local government representatives, school teachers, community leaders, community health care representatives, parents, and adolescents (n=165, 67% females). Data were collected through key informant interviews and focus group discussions, followed by a thematic analysis to explore the influence of gender norms on adolescent dietary patterns.
Results: The understanding of gender norms varied between urban and rural areas, with urban participants showing greater awareness of gender equality. Mothers were generally responsible for managing household food intake, including decisions on food preparation and purchasing. Skipping breakfast, small food portions related to body image, and a preference for discretionary foods were more common among adolescent girls. Adolescent boys tended to consume more carbohydrates and protein, driven by social norms around physical strength. Economic constraints and cultural norms contributed to low animal protein intake and increased ultra-processed food intake in rural adolescents.
Conclusions: Gender norms play a significant role in shaping adolescent dietary patterns, and future dietary interventions for adolescents may need to consider the influence of gender.

PV007 / #475

FACTORS AFFECTING QUALITY OF LIFE IN ADOLESSENT WITH INTELLECTUAL DISABILITY AT STATE SPECIAL SCHOOLS IN PADANG CITY

CHILDHOOD & ADOLESCENCE

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Background and Aims: Background: Quality of life assessment has important clinical implications and factors affecting with intellectual level, clinical and socioeconomic status.
Methods: Methods: A cross-sectional design was conducted among 95 adolescences with intellectual disability aged 12-18 years at 2 state Special Schools in Padang City. IQ level was assessed by the Culture Fair Intelligence Scale (CFIT) and Quality of life was measured by the PedsQL 4.0 Generic Core Scales parent-report version. Stastic analisys with Bivariate analysis was measured with Chi-Square.
Results: Results: The majority of subjects had age mean (14.8 ± 2,1 years) , boy (50,5%), moderate status (50.5%), all had therapy, not have familial history (84.2%), age of diagnosis <5 years (63.2%), mild intellectual disability with mean IQ score of 52.8. Total of 68.4% of children had impaired quality of life with mean score of 57.7. There was a highly significant factors affecting quality of life between IQ level and parental education and family socioeconomic status ($p<0.001$) .
Conclusions: Conclusion: Affecting factors were highly significant factors which affect quality of life between IQ level, parental education and socioeconomic status.

PV008 / #363

MACRONUTRIENT COMPOSITION AND ITS ENDOCRINE FOOTPRINT: A COMPARATIVE REVIEW OF HORMONAL EFFECTS OF PEDIATRIC DIETS

CHILDHOOD & ADOLESCENCE

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Background and Aims: Dietary composition during childhood and adolescence critically influences growth, metabolism, and endocrine function. Macronutrient composition—particularly fat, protein, and carbohydrates proportions —play a pivotal role in modulating hormonal pathways. To synthesize current evidence on how macronutrient profiles affect hormonal regulation in growing children and identify potential clinical implications for growth and metabolic health.
Methods: A literature review of 20 peer-reviewed studies published (2000-2025) was conducted, focusing on hormonal, growth, or metabolic outcomes in pediatric subjects on various macronutrient diets. Key hormonal endpoints included IGF-1,insulin, cortisol, T3, and sex steroids.
Results:

Table: Growth, Metabolic, and Endocrine Effects of Macronutrient Diets in Pediatric Populations

Diet Type	Growth Impact	Metabolic Effects	Hormonal / Endocrine Impact
High-Fat Diet (HFD)	May impair linear growth if prolonged in early life	↑ Insulin resistance, ↑ LDL/Triglycerides, fatty liver (NAFLD)	↓ Insulin sensitivity; ↑ Leptin; ↑ Cortisol (stress axis); potential GH resistance
High-Protein Diet (HPD)	Supports linear growth, may increase BMI slightly	↑ Satiety, ↑ thermogenesis, ↓ fat mass (short-term); risk of excessive protein intake	↑ IGF-1; ↑ Insulin; ↓ Ghrelin (appetite); possible ↑ Androgens (esp. in early puberty)
High-Carbohydrate Diet	Neutral to mildly positive growth with complex carbs	↑ Energy availability; ↑ obesity risk if refined sugars predominate	↑ Insulin (esp. with refined sugars); ↓ GH secretion in hyperinsulinemic states
Low-Fat Diet	Neutral effect on growth in most studies	↓ Total cholesterol and LDL; may affect energy balance in active youth	↓ Leptin (with fat loss); possible ↓ sex steroids (if very low fat intake over time)
Low-Protein Diet	↑ Risk of stunting, impaired muscle mass and bone growth	↓ Muscle protein synthesis; ↑ Fatty liver risk; ↓ Bone mineralization	↓ IGF-1; ↓ Insulin; ↓ PTH/vitamin D pathway; ↑ Cortisol (due to undernutrition stress)
Low-Carb Diet (LCD/KD)	Short-term weight loss; may reduce height velocity with long use	↓ Insulin resistance, ↓ body fat; risk of dyslipidemia and micronutrient deficits	↓ Insulin; ↓ IGF-1; ↑ Cortisol (ketosis-induced); altered thyroid function (↓ T3 in some cases)

Hormonal Axis	High-Fat	High-Protein	High-Carb	Low-Fat	Low-Protein	Low-Carb/Keto
GH–IGF-1 Axis	↓ GH sensitivity	↑ IGF-1	↓ GH in hyperinsulinemia	No major effect	↓ IGF-1	↓ IGF-1
Insulin Sensitivity	↓ (↑ insulin resistance)	↑ Insulin	↓ (with excess refined carbs)	↑ Sensitivity	↓ Insulin production	↑ Sensitivity
Cortisol Axis	↑ Chronic stress	Neutral	Neutral	Slight ↑ with low energy	↑ (catabolic stress)	↑ (keto-induced stress)
Thyroid Function	Variable	Neutral	↓ TSH with excess carbs	Possibly ↓ T3 with long-term low fat	↓ T3/T4 with protein malnutrition	↓ T3 (adaptive ketosis)
Sex Steroid Axis	Neutral or ↓ estrogen	↑ Androgens (puberty)	Variable (linked to weight)	↓ Estrogen/testosterone if prolonged	Delayed puberty, ↓ gonadotropins	↓ Estrogen/testosterone
Appetite Hormones	↑ Leptin	↓ Ghrelin	↑ Ghrelin with high sugar	↓ Leptin	↑ Ghrelin (compensatory)	↓ Ghrelin, ↑ satiety

High-protein diets were consistently associated with elevated IGF-1 and insulin levels, likely to support linear growth and pubertal progression, with some risk of excessive weight gain. Low-protein diets led to suppression of IGF-1, insulin, and sex steroids, and were associated with increased cortisol, reflecting catabolic stress and risk of growth retardation. High-fat diets, particularly with poor carbohydrate quality, induced insulin resistance and elevated cortisol and leptin, without consistent gains in growth hormone activity. Low-carbohydrate diets, including ketogenic regimens, improved insulin sensitivity but often led to reductions in IGF-1, T3, and sex hormones, raising concern for growth suppression and delayed puberty. Low-fat diets appeared metabolically neutral but may reduce fat-soluble hormone precursors, slightly affecting T3 and sex steroids if prolonged.

Conclusions: While High-protein diets may enhance anabolic pathways, low-protein and low-carbohydrate diets risk impairing key growth and endocrine axes. Pediatric nutrition strategies should prioritize balanced macronutrient intake tailored to age, growth stage, and health status. Endocrine monitoring may be warranted in children on restrictive diets.

PV009 / #337

ATTAINMENT OF GENETIC HEIGHT POTENTIAL AMONG ISRAELI ADOLESCENTS: A NATIONWIDE COHORT STUDY

CHILDHOOD & ADOLESCENCE

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Background and Aims: Height trends across generations reflect population-level changes in public health, environment, and lifestyle. Throughout the 20th century, there was a steady increase in average height; however, recent evidence suggests that this trend may be plateauing. This study aimed to determine whether Israeli adolescents are reaching their genetically predicted adult height, and to identify factors associated with deviation from expected growth.
Methods: Retrospective cohort study using electronic health records of 18,513 adolescents born in 2007 and enrolled in Maccabi Healthcare Services. Measured height at approximately age 18 was compared with predicted height estimated from mid-parental values. Additional variables included BMI, use of stimulant medications, socioeconomic status, and geographic region.
Results: More than half of the boys and nearly half of the girls did not reach their predicted height. Girls were more likely than boys to attain their expected height (OR = 0.81, 95% CI: 0.76–0.86, $p < 0.001$). Underweight status (BMI < 5th percentile) was associated with reduced height attainment (6.6% vs 7.7%, $p < 0.001$). Stimulant use during childhood was also linked to lower achieved height (OR = 1.17, 95% CI: 1.07–1.28, $p < 0.001$). Socioeconomic background and region of residence influenced growth, with better outcomes among adolescents from higher SES groups and those living in north of Israel ($P<0.004$).
Conclusions: In a population with broad access to healthcare, differences in growth were observed across weight status, medication use, and socioeconomic background. Suggesting that multiple modifiable and contextual factors may influence height attainment and highlight the importance of continued monitoring and targeted preventive strategies

PV010 / #625

EVALUATION OF NUTRITIONAL BEHAVIORS IN PEDIATRIC INDIVIDUALS RECEIVING SPECIAL EDUCATION

CHILDHOOD & ADOLESCENCE

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Background and Aims: Children with autism spectrum disorder (ASD) and intellectual disability (ID) frequently experience feeding difficulties. This study aimed to evaluate nutritional behaviors and anthropometric characteristics of children and adolescents receiving special education and to compare ASD and ID groups.
Methods: This descriptive, cross-sectional study was conducted between January and July 2025 at a special education school in Istanbul. Nutritional behaviors were assessed using the Behavioral Pediatric Feeding Assessment Scale (BPFAS), which consists of 34 items scored from 34 to 170, where higher scores indicate more severe problematic feeding behaviors. A total frequency score >84 and a problem score >9 are considered clinically elevated. Anthropometric measurements were evaluated using WHO Z-scores. Comparisons were made between the ASD (n=22) and ID (n=21) groups.
Results: Elevated BPFAS total scores (>84) were detected in 13.6% of the ASD group and 28.6% of the ID group. Problem behavior scores >9 were observed in 45.5% of ASD and 42.9% of ID participants. No statistically significant differences were found between groups in BPFAS subscale or total scores ($p>0.05$). Anthropometric measures including body weight, height, and BMI were also similar between groups ($p>0.05$). Overweight and obesity were common in both groups(OSB: %54,5; ID: %42,9).
Conclusions: Feeding problems are prevalent among children receiving special education, with comparable behavioral and anthropometric profiles in those with ASD and ID. Routine screening using standardized feeding assessment tools and early multidisciplinary interventions are recommended.

PV011 / #406

IMPACT OF EXAM STRESS ON EMOTIONAL EATING AND BODY WEIGHT AMONG ADOLESCENTS

CHILDHOOD & ADOLESCENCE

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Background and Aims: Adolescence is a period of rapid change in which stress and irregular eating behaviors can increase the risk of emotional eating and weight-related problems. Emotional eating—triggered mainly by negative emotions—is common during exam preparation. This study examined the relationship between exam-related distress–eustress levels, emotional eating, and body weight in adolescents.
Methods: The study was conducted face-to-face with 72 students between 01.03.2024 and 01.08.2024. Data were collected using a general information form including demographic variables such as age, body weight, and height, as well as the "Adolescent Distress–Eustress Scale" and the "Emotional Eating Scale for Children and Adolescents." The participants' body weight, height, and handgrip strength were measured using standard procedures. The data were analyzed using SPSS 25.0, and a significance level of $p<0.05$ was accepted for all statistical analyses.
Results: Body weight demonstrated strong positive correlations with BMI, mid–upper arm circumference, and handgrip strength measurements (all $p < .001$). BMI was similarly associated with arm circumference and handgrip strength. Emotional eating scores showed low but significant positive correlations with body weight, arm circumference, and handgrip strength, and its subscales were also positively associated with body weight ($p < .05$). In contrast, neither the distress nor the eustress subscale of the Adolescent Distress–Eustress Scale exhibited a significant correlation with emotional eating.
Conclusions: Emotional eating in adolescents was associated with body weight and other anthropometric measures, while no significant relationship was observed between emotional eating and distress or eustress levels.

PV012 / #667

ACCURACY OF PREDICTIVE WEIGHT EQUATIONS AND ITS ASSOCIATION WITH AGE, HEIGHT AND FATMASS IN HEALTHY CHILDREN

CHILDHOOD & ADOLESCENCE

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Background and Aims: In prehospital or emergency situations, rapid knowledge of a child's weight is essential. This study investigated whether the results of weight prediction equations (WPE) agree to the measured weight and what factors are associated with (in)accuracy.
Methods: Data from 86 healthy children (5-9 years) were analysed. Bland-Altman plots were used to assess agreement between 6 different WPEs and measured weight. Acceptable error was defined as ≤5% difference. Multiple linear regression was used to investigate factors associated with % error.
Results: Data from a total of 86 children (45, 52% girls) were analysed. The mean (SD) weight, height, BMI, mid upper arm circumference, triceps skin fold and subscapular skin fold z scores were respectively 0.14 (0.99), 0.26 (1.17), 0.01 (0.93), 0.00 (0.96), -0.05 (0.76) and -0.06 (0.89). **Table 1** shows that CEEW1 has the highest percentages of accurate estimates (55.8%). The Argall, Luscombe and APLS-ALT WPE were more prone to major overestimation and the APLS WPE to major underestimation of the measured weight. Factors associated with the degree of error for the Argall and Luscombe WPE were age (-0,6 p <0,01), height z score (2.2, p<0.001) and fat % (0.7, p<0.001). For the APLS and APLS-ALT WPE, factors associated with the degree of error were height z score (2.2, p<0.001) and fat % (0.7, p<0.001).

	>10% underestimation N (%)	5-10 % underestimation N (%)	0-5% N (%)	5-10 % overestimation N (%)	>10 % overestimation N (%)
Argall	9 (10,5)	5 (5,8)	14(16,3)	13(15,1)	45(52,3)
Luscombe and Owen	5 (5,8)	5 (5,8)	13 (15,1)	6 (7,0)	57 (66,3)
APLS	43 (50,0)	17 (19,8)	13 (15,1)	6 (9,3)	57 (5,8)
APLS-ALT	14 (16,3)	8 (9,3)	21 (24,4)	16 (18,6)	27 (31,4)
CEEW1	7 (8,1)	14 (16,3)	48 (55,8)	13 (15,1)	4 (4,7)
CEEW2	19 (22,1)	17 (19,8)	35 (40,7)	10 (11,7)	5 (5,8)

Table 1

Conclusions: Most weight prediction equations grossly over- or underestimate the actual weight in children, with prediction errors increasing in children who were younger, taller or had higher fat %.

PV013 / #491

BULGARIA'S NEW ORDINANCE ON HEALTHY NUTRITION OF STUDENTS: FROM PUBLIC CONSULTATION TO IMPLEMENTATION

CHILDHOOD & ADOLESCENCE

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Background and Aims: Childhood overweight and obesity are common in Bulgaria and linked to unhealthy school food environments. Ordinance (2009) on healthy nutrition of students no longer reflected updated national dietary reference values or recent evidence. In 2025, a new Ordinance 3 on healthy nutrition of students was adopted. The aim of the present study is to describe its development and main advances over the 2009 regulation.
Methods: Comparative policy analysis of Ordinance (2009) and Ordinance (2025), informed by the 2018 Bulgarian dietary reference values and relevant international guidance was performed. Draft texts, motives and written submissions from the national public consultation (15 February–17 March 2025) were reviewed and thematically summarised.
Results: The new ordinance widens the scope of regulation from school canteens to dormitories, sports and training bases, centres for personal development, school buffets, vending machines and catering services. It introduces updated age-specific energy and macronutrient standards, a daily minimum of 400 g fruits and vegetables in full-day provision, mandatory use of wholegrain products and updated criteria for milk, dairy, meat and fish. It bans fried snacks, high-fat/high-sugar confectionery, instant soups and sugar-sweetened and energy drinks in school outlets. Stakeholders broadly supported stricter standards, while requesting clearer terminology and realistic implementation timelines.
Conclusions: Bulgaria's new school nutrition ordinance modernises a long-standing regulatory framework and aligns it with contemporary evidence. The combination of updated nutrient standards, comprehensive coverage of food outlets and transparent consultation provides a stronger basis for improving dietary quality and supporting healthy growth among students.

PV014 / #131

CHILDHOOD UNDERWEIGHT IN THE FIRST 1000 DAYS: ADOLESCENT AND ADULT IMPACTS & INTERVENTION EFFICACY

CHILDHOOD & ADOLESCENCE

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Background and Aims: The first 1,000 days of life (birth to age 2 years) are a critical period for somatic and neurocognitive development. Low BMI or underweight during this phase is strongly associated with stunting, wasting, and impaired organ development. aim is to summarize evidence from PubMed-indexed studies on: (1)effects of underweight in the first1,000 days on adolescent and adult growth, neurocognition, and health; (2)the role of early-life interventions in mitigating these outcomes.
Methods: A narrative synthesis of multicenter cohort studies and reviews, including the COHORTS collaboration, Lancet nutrition series, and randomized trials of early nutritional interventions. Outcomes were grouped by growth, cognition/human capital, and general health.
Results: Early-life undernutrition leads to shorter adult height, lower lean mass, and poor cognitive and economic outcomes. It is associated with reduced IQ, fewer years of schooling, and lower productivity. Interventions like protein-energy and micronutrient supplementation in infancy have been shown to improve growth, cognitive development, education, and labor outcomes without major metabolic risks. However, early underweight followed by rapid weight gain increases the risk of adult metabolic diseases. Balanced interventions that promote linear growth without excess fat are key. Addressing early undernutrition can reduce mortality, stunting, and long-term disease burden, especially in low-resource settings, enhancing overall human capital.
Conclusions: Low BMI or underweight in the first 1,000 days exerts lifelong effects on height, cognition, and health. Evidence supports that early interventions—nutritional supplementation, infection control, and dietary diversification—substantially improve adolescent and adult outcomes. Programs should prioritize linear growth promotion while preventing excess weight gain beyond infancy.

PV015 / #442

THE QEPS-GROWTH MODEL - A RESEARCH TOOL FOR DETAILED ANALYSIS AND EXPLORATION OF HUMAN GROWTH IN HEALTH AND DISEASE

CHILDHOOD & ADOLESCENCE

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Background and Aims: Mathematical models can be used to describe human growth. The first model to describe individual longitudinal human growth and its different phases from fetal life until adult height is the QEPS-model. We aimed to show the usefulness of the model by showing how the model, using precise estimates, can analyse and describe individual human growth patterns and the models ability to characterise growth patterns of healthy cohorts and study groups with clinical conditions
Methods: The QEPS-model describes individual growth from fetal life to adulthood, using mathematical functions; a quadratic-function Q representing basic continuous growth from early fetal life until adult height, a stop-function S, the exponential function E specific for early-life growth and the specific pubertal function P. The model use four height-scale and two time-scale parameters. Longitudinal community based cohorts (GrowUp1974Gothenburg/GrowUp1990Gothenburg and the Edinburgh growth study) as well as clinical groups with obesity, congenital adrenal hyperplasia (CAH) and Klinefelters syndrome have been investigated.
Results: Growth patterns in community based cohorts have been analysed and new growth references have been developed. Estimates of pubertal growth from the QEPS-model make it possible to conduct detailed analyses of pubertal growth. A negative linear correlation between the highest BMI in childhood and pubertal height gain was seen. The impact of early growth on subsequent growth has been shown. Growth patterns of patients with obesity, CAH and Klinefelter have been characterised.
Conclusions: The QEPS-model has the ability to characterise growth patterns for both healthy children and children with syndromes/diseases and serve as a valuable research tool.

PV016 / #457

MORPHOFUNCTIONAL ASSESSMENT AS A COMPLETE DIAGNOSTIC TOOL OF NUTRITIONAL STATUS IN CHILDREN WITH CROHN'S DISEASE ON CROHN'S DISEASE EXCLUSIÓN DIET AND PARTIAL ENTERAL NUTRICIÓN

CHILDHOOD & ADOLESCENCE

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Background and Aims: Nutritional therapy utilizing the Crohn's Disease Exclusion Diet (CDED) in combination with partial enteral nutrition (PEN) is an effective, well-tolerated approach for inducing clinical remission and improving nutritional status in pediatric Crohn's disease (PCD). This strategy has demonstrated higher adherence and sustained remission rates than exclusive enteral nutrition. The primary objective is to evaluate the efficacy of CDED plus PEN on clinical activity and nutritional parameters.
Methods: Retrospective study of 30 children diagnosed with PCD over the past six years at a tertiary hospital, in whom the CDED combined with PEN was used for induction of remission. Analytical parameters, anthropometric assessment, and bioelectrical impedance were analyzed after accepted participation.
Results: At diagnosis, median fecal calprotectin (FC) concentration was 1800 µg/g (IQR 731 µg/g), and median albumin concentration was 3.71 g/dL (IQR 0.82 g/dL). Following 6 weeks of therapy with CDED+PEN, both FC and albumin demonstrated an improvement, with median values of 740 µg/g (IQR 743 µg/g, $p<0.01$) and 4.11 g/dL (IQR 0.68 g/dL, $p=0.002$), respectively. At one-year follow-up, median FC and albumin was 212 µg/g (IQR 592 µg/g, $p<0.01$) and 4.50 g/dL (IQR 0.53 g/dL, $p=0.001$), respectively. At diagnosis, median phase angle by bioelectrical impedance was 5.05º (IQR 1.201). After three months, median phase angle increased to 5.20º (IQR 1.15, $p=0.68$), and at one year, it reached 5.70º (IQR 1.08, $p=0.48$).
Conclusions: The combination of CDED and PEN is effective in improving clinical activity, nutritional status, and body composition in pediatric patients with Crohn's disease.

PV017 / #400

THE IMPACT OF TOBACCO SMOKING ON GROWTH, GH–IGF-1 AXIS, BMI, AND BONE HEALTH IN ADOLESCENTS: A REVIEW OF CURRENT EVIDENCE

CHILDHOOD & ADOLESCENCE

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Background and Aims: Adolescence is vital for growth and development, regulated by the growth hormone (GH) and insulin-like growth factor 1 (IGF-1) axis. The impact of moderate to severe tobacco smoking on this axis in adolescents is not well-studied. Aim: to review research in last 25years on how tobacco smoking affects growth, GH–IGF-1 levels, body mass index (BMI), and skeletal development in adolescents.
Methods: *Methods:** Studies published between 1995 and 2025 that examined adolescent smoking and its effects on growth &bone health, particularly those measuring GH and IGF-1.
Results: Total of 10 studies involving over 17,000 adolescents showed negative associations between smoking and bone health. Daily smokers had significantly lower areal bone mineral density (BMD) and cortical thickness compared to non-smokers, along with reduced bone mass and impaired bone strength. Some studies, including Gnot, found lower BMD Z-scores in smoking adolescents, while evidence on body mass index (BMI) was mixed. Weitzman et al. (2005) and Szulc et al. (2004) reported higher fat mass among smokers, whereas other studies found no significant difference in BMI. Importantly, none of the studies measured growth hormone (GH) secretion patterns or serum IGF-1 concentrations in adolescent smokers. While some suggested possible growth impairment, these findings were indirect and lacked hormonal assessment.
Conclusions: Research indicates that adolescent tobacco smoking is linked to lower bone mineral density and poor skeletal development. However, there is a lack of studies directly examining GH secretion or IGF-1 in adolescent smokers, underscoring the need for future research on smoking's impact on growth pathways during this critical period..

PV018 / #661

LONGITUDINAL GROWTH TRAJECTORIES IN CHILDREN WITH TRANSFUSION-DEPENDENT BETA-THALASSEMIA: A 27-YEAR MIXED-LONGITUDINAL STUDY FROM NORTH INDIA

CHILDHOOD & ADOLESCENCE

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Background and Aims: Transfusion-dependent β-thalassemia (TDT) remains a major health burden in India and is associated with significant growth disturbances despite improvements in transfusion and chelation practices. Children with TDT commonly exhibit delayed puberty, linear growth deceleration, and altered body proportions. This study aimed to characterize longitudinal growth patterns, nutritional deficits, and body proportionality in individuals with TDT.
Methods: A total of 602 children with β-thalassemia major (424 boys, 178 girls), aged 1–25 years, were enrolled in this mixed-longitudinal study. Across 27 years (1998–2025), 7277 anthropometric measurements were collected at six-month intervals at a tertiary-care center in north-western India. Standardized assessments included height, weight, BMI, MUAC, skinfolds, sitting-height, arm-span, US:LS ratio. Growth velocities were estimated using linear mixed-effects models.
Results: Thalassemia children demonstrated progressive height and weight increments, but with markedly delayed and blunted pubertal growth spurts. Peak-height-velocity was substantially reduced—2.3 cm/year at 13years in girls and 2.2 cm/year at 17years in boys. Stunting affected 35.9% boys and 12.6% girls, with peak prevalence of 81.2% in boys at 15 years. Underweight prevalence was higher in boys (19.6%) than girls (7.3%). BMI showed absent or delayed adiposity-rebound. MUAC and skinfolds indicated better adiposity accrual in girls from mid-childhood. Body proportionality assessments revealed reduced arm-span and sitting-height velocities.
Conclusions: Children with TDT experience early growth faltering, delayed and diminished pubertal growth, persistent nutritional deficits, and altered body proportions. Early surveillance alongside optimized chelation, targeted nutritional rehabilitation, and timely endocrine interventions is essential to mitigate long-term growth impairment.

PV019 / #531

EARLY LIFE TRAJECTORIES OF BODY COMPOSITION IN HEALTHY TERM-BORN CHILDREN UNTIL AGE 5 YEARS

CHILDHOOD & ADOLESCENCE

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Background and Aims: As childhood obesity is a global health threat, there is a need to understand how body composition evolves during childhood. Therefore, the aim of this study was to investigate how body composition tracks from infancy to age 5.
Methods: We included 516 children of the Sophia Pluto Cohort study. Body composition was measured using air displacement plethysmography (1, 3 and 6 months) and Dual-energy X-ray Absorptiometry (9, 12, 18 and 24 months and 3, 4 and 5 years). Age- and sex-adjusted Standard Deviation Scores (SDS) were calculated for Fat Mass Index (FMI) and Fat Free Mass Index (FFMI). Odds ratios (OR) for remaining in the highest tertile were calculated using logistic regression. Trajectories were modeled using latent class linear mixed models.
Results: High FMI SDS tracked from 1, 3 and 6 months to 5 years (OR=1.67, OR=2.55 and OR=3.29, resp., all $p<0.05$). High FFMI SDS also tracked from 1, 3 and 6 months to 5 years (OR=2.36, OR=2.20 and OR=2.45, resp., all $p<0.05$). Latent class analyses showed that a rapid increase in FMI and FFMI SDS in the first two years of life tracked to a higher SDS at 5 years. Determinants of body composition trajectories will be presented at the congress.
Conclusions: A high FMI SDS or FFMI SDS, or a rapid increase in early life, is likely to track to higher FMI and FFMI SDS at 5 years. These data support the presence of a critical window of adiposity and FFM programming in early infancy, providing opportunities for prevention and intervention.

PV020 / #578

BRIDGING THE GAP: DEVELOPING A NOVEL RECIPE RESOURCE TO IMPROVE DIETARY PATTERNS IN TODDLERS AGED 24-42 MONTHS OLD

CHILDHOOD & ADOLESCENCE

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Background and Aims: Young children have enhanced micronutrient requirements to support rapid growth and development, yet inadequate intakes and poor status are widespread. Barriers including food fussiness and limited parental nutrition knowledge contribute to children's reliance on low-nutrient foods. We aimed to develop a parent/guardian focused recipe resource addressing these barriers to improve dietary patterns in 24–42-month-old children.
Methods: A multi-stage participatory approach encompassing feedback from chefs, dietitians, paediatricians, nutritionists, parents and children informed development of the recipe resource. Nutritional analysis was conducted using *Nutritics* to ensure recipe suitability and define nutrient profiles. Portion sizes were estimated by in-house preparation and testing. Five families evaluated five recipes through sensory testing.
Results: An initial dataset of 63 recipes was compiled from books and online sources before screening for feasibility and relevance to barriers, resulting in 14 final recipes across 3 categories. The categories (Finger Food Favourites, Batch Cooking basics and Double Duty Dishes) were designed to improve the practicality and usability of recipes, supporting their integration into families' weekly routines. A comprehensive parent-focused educational recipe booklet was created, supported by guidance on food skills, feeding practices and a sample meal plan. The resource was refined continuously at each step in the multi-stage development process, including adjustments to recipe ingredients, methods and portion sizing.
Conclusions: A practical recipe and education resource for parents was successfully developed following a rigorous multi-stage process integrating nutritional analysis, expert feedback and parental insights. The recipe resource will undergo further testing in a pilot intervention study.

PV021 / #142

EXPLORING FEEDING PRACTICES AMONG BRAZILIAN IMMIGRANT FATHERS OF PRESCHOOLERS: INSIGHTS FROM A U.S.-BASED QUALITATIVE STUDY

CHILDHOOD & ADOLESCENCE

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Background and Aims: Brazilians represent one of the fastest-growing Latino immigrant groups in the United States; however, little research has focused on health issues affecting Brazilian children in immigrant families. As evidence increasingly highlights fathers' influence on children's eating behaviors and weight outcomes, this study aimed to explore Brazilian immigrant fathers' perspectives and practices related to feeding their preschool-aged children, to inform culturally tailored family-based interventions.
Methods: A qualitative study was conducted using in-depth, semi-structured interviews with 21 Brazilian immigrant fathers residing in Massachusetts. Interviews were conducted in Portuguese by native Brazilian research staff, audio-recorded, and transcribed verbatim. A thematic analysis was performed using a hybrid approach that combined deductive codes from the interview guide with inductive themes emerging from the data.
Results: Fathers demonstrated awareness of the importance of healthy eating for their children and recognized their roles as models for positive dietary behaviors. Many described active involvement in feeding routines, such as meal preparation and food choices. Fathers expressed interest in participating in family-based interventions and a desire to "do what's right" for their children. Nearly all participants voiced eagerness to learn more about healthy feeding practices, emphasizing the need for culturally relevant guidance and support.
Conclusions: This study provides novel insights into Brazilian immigrant fathers' feeding beliefs and behaviors. Findings underscore the importance of engaging fathers in efforts to promote healthy eating. Future research should quantify paternal feeding styles and actively involve fathers in designing culturally appropriate interventions for immigrant families.

PV022 / #6

NUTRITIONAL STATUS AND ITS ASSOCIATED FACTORS AMONG PRIMARY SCHOOL STUDENTS WITH FEEDING AND WITHOUT FEEDING PROGRAM IN SANKURA WEREDA, SOUTHERN ETHIOPIA, 2022: COMPARATIVE CROSSSECTIONAL STUDY

CHILDHOOD & ADOLESCENCE

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Background and Aims: To avert such nutritional problems the government in collaboration with world food program has implemented a school feeding program. However, limited evidences exist regarding the improvement of school feeding program on nutritional status compare to non-school feeding program.
Methods: A cross-sectional study design & A multi-stage technique with proportional allocation was applied. Anthropometric data were analyzed using Anthro-plus software.
Results: In this study, 19.6% (10.8-20.7) and 15.5% (12.8-18.7) of students among non-school feeding and school feeding
program were stunted respectively. Nonetheless, 6% (3-9.1) and 5.2% (2.5-8.3) of students counted as overweight among school feeding program and non-school feeding program respectively. Being early adolescent 2.5(1.22-5.1), being male 3.7(2.44–6.06) and students who did not take meals at school 1.6(1.03–2.49) were statistically associated with thinness. Students having a mother with no formal education 2.3(1.2–4.47) and having poor dietary diversity score 1.7(1.05–2.89) were statistically associated with stunting. Students having a mother with no formal education 2.5(1.1–5.8) was statistically associated with overweight.
Conclusions: Based on the findings of this study, Thinness was higher among students who did not take meals at school than students who took meals at school.However overweight was higher among students in Schools with SFP than students in Schools without SFP.
Factors associated with stunting were students having uneducated mother and poor DDS.
Whereas, students who did not take meal at school and, male and early adolescent students were significantly associated with thinness. Students having uneducated mother was factor that significantly associated with overweight.

PV023 / #307

DIETARY PATTERNS AND NEUROPSYCHOLOGICAL FUNCTION IN ADOLESCENTS: A CROSS-SECTIONAL AND LONGITUDINAL STUDY

CHILDHOOD & ADOLESCENCE

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Background and Aims: Adolescence is a critical period for brain development, during which dietary patterns may influence neuropsychological functioning. We aimed to examine cross sectional associations and whether adherence to the Mediterranean diet (MD) and ultra-processed food (UPF) consumption predict changes in adolescent neuropsychological outcomes over six months.
Methods: We evaluated 653 adolescents (12 to 16 years) from Barcelona at baseline and six-month follow-up. MD adherence was assessed using the KIDMED index, while UPF consumption was evaluated through an FFQ and classified using the NOVA system. Cognitive domains were assessed using standardised computer-based tests: attention (alerting, orienting, executive control) with the Attention Network Test; working memory with the N-back test; fluid intelligence with the Primary Mental Abilities-Revised; decision-making with the Roulettes Task; and emotion recognition with the Emotion Recognition Task. Behavioural outcomes were measured using the self-reported Strengths and Difficulties Questionnaire and Attention-Deficit/Hyperactivity Disorder-DSM-IV scales (teacher-reported). Multivariable generalised linear models examined associations.
Results: Cross sectionally, greater MD adherence was associated with fewer behavioural problems and better executive function. Higher UPF consumption was associated with poorer emotion recognition, reduced alerting attention, less advantageous decision making, more behavioural problems and greater internalising symptoms. Longitudinally, higher UPF consumption predicted increased internalising symptoms and less advantageous decision making, whereas MD adherence showed no associations.
Conclusions: Adherence to the MD appears associated with protective effects in the short term, while UPF consumption is associated with adverse effects, even after six months. These findings support promoting healthier dietary patterns during adolescence, though further research is needed to better understand these complex associations.

PV024 / #589

NUTRITIONAL DETERMINANTS AND METABOLIC TRIGGERS OF JAUNDICE IN OLDER CHILDREN: A CASE-BASED FRAMEWORK HIGHLIGHTING G6PD DEFICIENCY

CHILDHOOD & ADOLESCENCE

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Background and Aims: Jaundice in older children and adolescents is less common than in infancy but remains an important marker of metabolic and nutritional imbalance. Nutritional factors — including antioxidant status, micronutrient stores, metabolic stress, and exposure to oxidant-rich foods — play a key role in modulating bilirubin metabolism and hemolytic vulnerability. Limited guidance exists on integrating nutritional assessment into the diagnostic framework for pediatric jaundice.
Methods: We developed a structured nutritional-metabolic evaluation pathway including dietary history, micronutrient assessment, and oxidative stress–related triggers. This framework was applied to an 8-year-old boy presenting with acute jaundice.
Results: The patient exhibited isolated unconjugated hyperbilirubinemia with biochemical evidence of hemolysis. G6PD deficiency — the most common enzymatic defect of red blood cells globally — was identified as the underlying cause. Nutritional factors played a central role: oxidative stress likely triggered by food exposure, folate-dependent erythropoiesis requiring supplementation, and the need for long-term dietary modification to prevent future crises. Broader nutritional considerations such as iron balance, antioxidant capacity (vitamins C & E), and avoidance of fava beans and certain food additives were integrated into management and counselling. The child recovered fully with targeted nutritional support and education.
Conclusions: A nutrition-oriented perspective is essential when evaluating jaundice in older children. Nutritional triggers, micronutrient deficiencies, and oxidative dietary exposures can precipitate or exacerbate hemolytic and hepatic causes of jaundice. The presented case demonstrates how integrating nutritional assessment into routine evaluation improves diagnostic accuracy, guides personalised dietary advice, and promotes long-term metabolic resilience in children with conditions such as G6PD deficiency.

PV025 / #458

BARRIERS AND DRIVERS TO IMPLEMENTATION OF NUTRITION-FRIENDLY PRESCHOOL INITIATIVE IN THE REPUBLIC OF SRPSKA, BOSNIA AND HERZEGOVINA: APPLICATION OF THE COM-B MODEL

CHILDHOOD & ADOLESCENCE

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Background and Aims: The **"Nutrition-Friendly Preschool Initiative" (NFPI)** has been implemented in the Republic of Srpska (RS), Bosnia and Herzegovina (BiH) since 2014. The program was developed in accordance with the World Health Organization *Nutrition-Friendly School Initiative* (NFSI), aiming to improve the healthy nutrition environment and children's eating habits. This paper specifically examines the level of NFPI implementation among kindergartens, as well as the barriers and facilitators influencing its successful implementation.
Methods: Data were collected during October and November 2023 from a sample of 110 preschools in RS (BiH). Preschool administrators completed an online self-administered questionnaire that assessed the five essential components of the NFPI. To explore barriers and drivers for NFPI implementation in line with the COM-B model (Capability, Opportunity, and Motivation), a short six-item questionnaire developed by Keyworth et al. (2020) was used.
Results: According to the findings, every second kindergarten achieved a higher NFPI index score (23 or above: 50.9%). Most kindergartens scored highest on the Motivation domain (7 or above: 79.8%), and lowest on the Capability domain (56.9%) of the COM-B model. Multiple regression analysis showed that the variables included in the model (level of municipal development, public/private status, number of enrolled children, and COM-B components) significantly predicted the NFPI index ($F = 4.903$, $p < .001$; Adjusted $R^2 = .180$). A significant association was found between the number of enrolled children and Capability with the NFPI index.
Conclusions: According to the Behaviour Change Wheel framework, interventions such as education or training for preschool staff are needed to support the successful implementation of the NFPI.

PV026 / #653

RELATIONSHIP BETWEEN FEEDING BEHAVIOR AND SELF-EFFICACY WITH HEDONIC HUNGER AND BODY MASS INDEX IN MIDDLE SCHOOL CHILDREN

CHILDHOOD & ADOLESCENCE

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Background and Aims: This study aims to evaluate the relationship between dietary behavior and self-efficacy with hedonic hunger and body weight in middle school students. Hedonic hunger differs from homeostatic hunger in that it means eating for pleasure even though one is not hungry. Hedonic hunger is triggered by factors such as emotional changes, stress, and the appeal of delicious foods.
Methods: This descriptive, cross-sectional study was conducted at Kocaeli Emlak Konutları Alparslan Secondary School between March and July 2025. It aimed to examine the relationship between nutritional behavior and self-efficacy with hedonic hunger and body weight in 10- to 14-year-old students. The study, conducted with 72 volunteer students, included a general information form, the Nutritional Behavior Scale, the Nutritional Self-Efficacy Scale, and the Children's Nutritional Power Scale-9. Height, weight, and BMI were measured using standard methods. The data were analyzed with appropriate parametric and non-parametric tests in SPSS 25.0, and the significance level was accepted as $p<0.05$. The study was conducted with the necessary ethical and official permissions.
Results: In this study, a significant relationship was found between nutritional self-efficacy and eating behavior among middle school students ($p<0.05$). Weak negative associations were observed between nutritional self-efficacy and hedonic hunger, and between eating behavior and hedonic hunger ($p<0.05$). Gender and BMI did not have a significant effect on nutritional self-efficacy, eating behavior or hedonic hunger.
Conclusions: Among middle school students, higher nutritional self-efficacy and healthier eating behaviors were associated with lower hedonic hunger levels, while neither gender nor BMI showed a significant effect on these variables.

PV027 / #109

A LARGE NATIONAL RETROSPECTIVE STUDY EXPLORING THE ASSOCIATION BETWEEN SMALL FOR GESTATIONAL AGE BIRTHWEIGHT AND EDUCATIONAL ACHIEVEMENT IN LATE CHILDHOOD

CHILDHOOD & ADOLESCENCE

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Background and Aims: There is conflicting evidence as to whether small for gestational age (SGA) birthweight is a risk factor for low educational achievement in childhood. This study aims to explore the effect of SGA on secondary school achievement while controlling for a wide range of confounders.
Methods: The Integrated Data Infrastructure is a national database of governmental and non-governmental data. All children born in New Zealand between 1998 and 2005 who attended secondary school were eligible for inclusion (n = SGA [25,341]; AGA [347,178]). Birth records were linked to secondary school qualifications, and a series of log-binomial regression models were used to determine the risk of low educational attainment.
Results: SGA children are at a 1.15 times greater risk of not achieving a formal qualification (95% CI: 1.08-1.24), a 1.05 times greater risk of not achieving a level one qualification (95% CI: 1.01-1.10), and 1.07 times greater risk of not achieving a level two qualification (95% CI: 1.02-1.12). Children born severely SGA (birthweight < 3rd percentile) are most at risk no secondary school educational attainment (severe SGA: aRR 1.20, 95% CI: 1.05-1.34 vs moderate SGA: aRR 1.13, 95% CI: 1.04-1.23). There is also a significant interaction between SGA birthweight and preterm birth.
Conclusions: This study suggests that children born SGA are significantly less likely to achieve secondary school qualifications compared to their AGA peers. This risk increases with the severity of SGA. Decreased effect size with adjustment for confounders would indicate that both SGA birthweight and environmental factors increase the risk of low achievement.

PV028 / #8

LIMITED EVIDENCE THAT EARLY LIFE GROWTH PREDICTS WELL-BEING IN ADOLESCENCE

CHILDHOOD & ADOLESCENCE

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Background and Aims: Growth is strongly associated with later health outcomes, but the extent to which early-life growth relates to well-being in adolescence remains uncertain. We hypothesized that impaired growth during infancy or childhood would be associated with reduced well-being at around 18 years of age.
Methods: This population-based study included 4319 individuals from the GrowUpGothenburg 1974 and 1990 cohorts. Longitudinal height measurements were analyzed using the QEPS model to characterize individual growth trajectories. Well-being in adolescence was assessed with the Gothenburg Well-being in Adolescence scale.
Results: Early-life growth indicators, including birth size, height at 2, 4, and 7 years, and growth change, showed no clinically relevant associations with adolescent well-being across cohorts or sexes. In the 1974 cohort, males born large for gestational age reported higher total well-being compared with those born appropriate or small for gestational age. Conversely, females classified as large for gestational age by weight reported lower mood and self-esteem.
Conclusions: Early-life growth explained minimal variation in self-reported well-being at ~18 years, suggesting limited clinical significance. These findings provide evidence that deviations in infancy or childhood growth trajectories are unlikely to meaningfully influence adolescent well-being, which may be of value to healthcare professionals and caregivers.

PV029 / #100

ASSOCIATION OF SOCIO-DEMOGRAPHIC FACTORS, PERINATAL CHARACTERISTICS, AND HOSPITAL MATERNITY PRACTICES WITH BREASTFEEDING OUTCOMES IN THE UAE

CHILDHOOD & ADOLESCENCE

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Background and Aims: Breastfeeding (BF) rates remain suboptimal in the United Arab Emirates (UAE), despite global and national efforts. This study examined the association of socio-demographic factors, perinatal characteristics, and hospital maternity practices with breastfeeding outcomes in the UAE.
Methods: A cross-sectional study in Abu Dhabi, UAE, included Emirati and non-Emirati mothers of children under two. Mothers were recruited in health centers and communities, consented, and interviewed using a structured 57-item questionnaire (Arabic/English, validated by back-translation). Variables included socio-demographics, perinatal factors, hospital practices, and breastfeeding outcomes (initiation, initiation within 1 hour, EBF at 3 months, and duration at 6 and 9 months).
Results: Multivariate analysis showed that a non-Emirati nationality and vaginal birth were significantly associated with higher initiation rates (AOR = 6.19, 95% CI 1.96–19.54 and AOR = 2.65, 95% CI 1.35–5.21, respectively), timely initiation (AOR = 0.48, 95%CI 0.35–0.66, respectively), longer BF duration (AOR = 1.55, 95%CI 1.05–2.27 and AOR = 1.45, 95%CI 1.08–1.93, respectively) and longer exclusive BF duration (AOR = 1.50, 95%CI 1.06–2.11 and AOR = 1.35, 95%CI 1.03–1.78, respectively). Parity, hospital practices, maternal education, and employment were significantly associated with certain BF practices.
Conclusions: Both vaginal birth and rooming-in were positively associated with breastfeeding initiation and timely initiation, linked to longer durations of both exclusive and any breastfeeding. Giving birth at baby-friendly hospitals and being a multiparous mother were also associated with longer breastfeeding. This support continued efforts to expand the WHO Baby-Friendly Hospital Initiative in Abu Dhabi, underscoring the importance of early and ongoing antenatal education, particularly for primiparous women.

PV030 / #273

MODERN DIAGNOSTIC ALGORITHMS FOR CROHN'S DISEASE: INTEGRATING THE MONTREAL CLASSIFICATION, LÉMANN INDEX, AND PCDAI IN THE PEDIATRIC POPULATION

CHILDHOOD & ADOLESCENCE

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Background and Aims: Crohn's disease is a chronic autoimmune inflammatory granulomatous disease that affects the entire digestive tract, especially the terminal part of the ileum and the large intestine. Its etiology is multifactorial and includes both genetic and immunological, as well as environmental factors. The disease can develop at any age. The Pediatric Crohn's Disease Severity Index (PCDAI), the Montreal Classification, and the Lemann Index, adopted in 2021, are important diagnostic criteria for this disease.
Methods: Up to 15 cases of Crohn's disease have been recorded at the M. Iashvili Children's Central Clinic over the past twenty years. The study aimed to analyze 5 recent clinical cases, determine gender and ethnic preferences, assess patients using the Pediatric Crohn's Disease Severity Index, the Montreal Classification, and the Lemann Index, and identify prognostic criteria.
Results: Two patients had mild to moderate Crohn's disease (PCDAI score range: 10–37.5), and their assessments according to the Montreal Classification were A1L2 and A2L2. Three patients had a relatively severe form of Crohn's disease (PCDAI score range ->40). The Lemann index was approximately in the middle of the internationally recognized range, 0.2-12.6. Extraintestinal clinical manifestations such as anemia and arthritis were detected in the latter patients.
Conclusions: A high score of pediatric Crohn's disease severity, assessment of patients by the Montreal classification (various ALB variants), and a high Lemann index indicate a relatively severe course of the disease and require careful treatment. The main line of treatment in patients with mild disease was prednisolone, and in patients with severe disease was infliximab.

PV031 / #299

FEASIBILITY AND ACCURACY OF PARENT-LED CHILD GROWTH MEASUREMENTS FOR REMOTE HEALTHCARE

CHILDHOOD & ADOLESCENCE

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Background and Aims: Remote healthcare is expanding, with accurate growth data essential for nutritional care. However, guidance for routine parent-led measurements is limited and largely untested. This study evaluated the feasibility and accuracy of parent/carer-led child growth measurements performed at home, compared to 'Gold-Standard' measurements taken in hospital.
Methods: A survey was distributed to parents/carers of children attending outpatient clinics to assess access to weighing scales and tape measures. Of 684 respondents (49% response), 61% owned both, with ownership twice as likely in relatively affluent postcodes (IMD 5–10). 140 families consented to home measuring; due to low recruitment in 0–2-year-olds (n=18), analysis was restricted to 122 2–15-year-olds with median age 8.5 [IQR 5,12]. Home measurements were taken within 48 hours prior to appointments, where two trained staff repeated measurements. Parent/carer experiences were explored via short interviews. The Bland–Altman method was used to estimate limits of agreement (LOA); qualitative themes were collated
Results: Participants were predominantly white British (88%) from relatively affluent areas (78% IMD 5–10). Mean differences between parent/carer and HCP measurements were -0.27% for height and 0.16% for weight. LOAs were 3.46 to 3.79% (height) and -4.91 to 4.36% (weight). The majority found the process straightforward but felt more confident weighing than measuring. Most were willing to provide measurements before remote appointments.
Conclusions: Parent-led measurements appear feasible and reasonably accurate, although LOA's exceeded our 2% target. Equipment access was limited in less affluent families. Routine home measurement should be optional for remote consultations, not expected.

PV032 / #563

DETERMINANTS OF FREE DRINKING WATER AVAILABILITY IN PUBLIC PRIMARY AND SECONDARY SCHOOLS IN KRAKÓW, POLAND

CHILDHOOD & ADOLESCENCE

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Background and Aims: Ensuring access to free drinking water in schools supports healthy body weight among children. In Poland, data on water availability in educational settings are limited and suggest inequalities. This study assessed the availability of free drinking water and its relationship with the organization of school catering services in primary and secondary schools in Kraków (Southern Poland).
Methods: In 2022, a CAWI survey was conducted among directors of 68 public primary schools and 18 secondary schools using an author-designed questionnaire. Additionally, parents of 1,730 schoolchildren (1,675 with complete anthropometric data) reported their child's BMI category and perceived access to drinking water. Among the children, 17.2% were underweight, 9.4% overweight and 3.9% obese. Statistical analyses used generalized linear models with a gamma distribution.
Results: Parents reported that 26.1% of children did not have access to free drinking water, 51.6% did have access and 22.3% were unsure. According to school directors, free drinking water was available in 57 schools (66.3%), more often in primary than in secondary schools (72.1% vs. 44.4%, $p = 0.028$). Schools providing free drinking water had higher daily meal fees ($\beta = 0.2781$; 95% CI: 0.1416–0.4147; $p < 0.001$), while facilities with an on-site kitchen had lower fees than schools without one ($\beta = -0.1458$; 95% CI: –0.2482 to –0.0434; $p = 0.005$).
Conclusions: The findings indicate variation in the availability of free drinking water linked to organizational aspects of school food services. Enhancing water provision and communication with parents may support healthier school environments and hydration practices among children.

PV033 / #448

ASSESSMENT OF NUTRITIONAL STATUS AMONG CHILDREN DIAGNOSED WITH AUTISM SPECTRUM DISORDER: A CROSS-SECTIONAL STUDY

CLINICAL NUTRITION

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Background and Aims: Nutritional deficiencies and growth abnormality are frequently reported in individuals with autism spectrum disorder (ASD). This study assessed the anthropometric, body composition, and key serum micronutrients in children with ASD.
Methods: A cross-sectional study included children and adolescents with ASD. Weight and height were measured, and values were converted to anthropometric Z-scores derived from WHO standards. Serum levels of 25-hydroxyvitamin D (25OHD), ferritin, and folate were measured. Vitamin D status was defined as deficient (≤20 ng/mL) and insufficient (21–29 ng/mL); ferritin deficiency as <7 ng/mL; and folate deficiency as <4 ng/mL. Body composition was measured using multi-frequency bioelectrical impedance analysis. Analysis included one-sample t-tests against population reference.
Results: We recruited 155 children with ASD aged 4–18 years (mean age = 11.2 ± 4.0 years; 89.7% male). Participants had a low mean height-for-age Z-score (–0.66 ± 1.42; $p < 0.001$) and a high prevalence of overweight/obesity (52.2%). The prevalence of deficiency for vitamin D, ferritin, and folate was 88.9%, 27.5%, and 0.7%, respectively. For body composition, fat mass (FM) and fat-free mass (FFM) were significantly higher in males than females (FM: 16.13 ± 14.78 kg vs. 11.14 ± 11.23 kg, $p = 0.195$; FFM: 35.25 ± 15.76 kg vs. 25.82 ± 13.92 kg, $p = 0.024$).
Conclusions: Children and adolescents with ASD were shorter, with a high prevalence of vitamin D and ferritin deficiencies and show higher risk of obesity. These findings highlight the importance of individualised management to address nutritional status in this population.

PV034 / #247

REPORTED MEAL PATTERNS OF YOUNG PEOPLE WITH DUCHENNE MUSCULAR DYSTROPHY: A CAREGIVERS' SURVEY

CLINICAL NUTRITION

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Background and Aims: Nutrition is an important aspect of the care of children and young people (CYP) with Duchenne Muscular Dystrophy (DMD). This study aimed to explore caregivers' perspectives on meal patterns and food choices.
Methods: The study recruited caregivers of CYP with DMD. This survey was circulated online via UK patient organisations (May-August 2024). Caregivers were asked to record meal patterns and list the top 3 food choices of the individual with DMD for all main meals and snacks.
Results: Sixty-five caregivers participated (94% mothers), mean CYP age was 12 years (SD 5.1). Most CYP were on corticosteroids (88%). Regarding eating patterns of main meals: 37/65 (57%) reported these were most often shared together at the dining table, 14/65 (22%) were eaten in front of the television and 4/64 (6%) were eaten alone. The majority 60/65 (92%) described main meals as occurring at consistent times of day and snack consumption at multiple times in a day 21/65 (32%). Within-meal preferences showed consistent dominance patterns (all $p<0.001$): toast/bread products at breakfast; sandwiches/wraps at lunch; chicken-based dishes at dinner and fruits/vegetables as snacks.
Conclusions: CYP with DMD in the UK appear to follow healthy meal patterns, though there remains a need for education to reduce screen-based eating and frequent snacking. Future research evaluating quantity and quality of food choices of CYP with DMD is needed to inform development of guidance on nutritional recommendations and education around food choices.

PV035 / #248

THE VIEWPOINTS OF CAREGIVERS ON DIETETIC INPUT FOR DUCHENNE MUSCULAR DYSTROPHY IN THE UNITED KINGDOM NATIONAL HEALTH SERVICE

CLINICAL NUTRITION

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Background and Aims: The 2018 International Care Considerations for Duchenne Muscular Dystrophy (DMD) recommend that a dietitian should assess nutritional status and create a specific nutritional plan at each clinic visit. This caregivers' survey examined availability of dietetic services in the UK for individuals with DMD.
Methods: A cross-sectional online survey was administered to caregivers of boys with DMD (May-August 2024).
Results: Sixty-five caregivers completed the survey. Most were mothers (93.8%) of boys with DMD with mean age 12 years (SD 5.1). Access to a dietitian was limited: just 14/65 (22%) reported a dietitian being available as part of their neuromuscular multi-disciplinary clinic; 44/65 (68%) had never been reviewed by a dietitian. When asked when routine dietetic review should take place: 50/65 (76%) stated soon after initiation of corticosteroids, and 56/65 (86%) stated once the young person with DMD is using a wheelchair for a majority of the time. Caregivers stated that nutrition information (multiple responses allowed) was sought from online articles/websites (30/65, 46%), cookbooks (26/65, 40%), and social media including TikTok and Instagram (21/65, 16%). Preferred format for nutrition information for DMD (multiple responses allowed) included recipe books (45/65, 69%), online learning modules (38/65, 59%), and leaflets (34/65, 52%).
Conclusions: Our survey revealed an existing gap in access to dietetic input for boys with DMD in the UK despite international recommendations. Parents sought nutrition information for DMD online. There is therefore a need to develop high-quality accessible information in this area alongside improving provision of dietetic support.

PV036 / #643

CHANGES IN MATERNAL HEALTH-RELATED QUALITY OF LIFE FROM MID-PREGNANCY TO POSTPARTUM AND ITS ASSOCIATION WITH PREGNANCY-RELATED FACTORS

CLINICAL NUTRITION

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Background and Aims: Maternal quality of life (QoL) changes considerably during pregnancy and the postpartum period, yet longitudinal evidence following women across these stages remains limited. This study aimed to examine changes in QoL from the sixth month of pregnancy to first week postpartum, and from postpartum month 1 to month 4 using the SF-36.
Methods: This prospective observational study followed mothers across four key timepoints: the sixth month of pregnancy (n=27), first week postpartum (n=20), one-month postpartum (n=22), and four months postpartum (n=10). Maternal quality of life was measured using the SF-36 scale. Changes over time were reviewed descriptively, and potential links with hyperemesis, maternal age, and income level were also explored.
Results: All SF-36 domains declined from pregnancy month 6 to first week postpartum. Physical Function decreased from 66.3 to 69.0, Vitality from 61.1 to 50.0. Mental Health fell from 71.0 to 63.4; Social Functioning from 60.6 to 51.3. Postpartum improvements were evident across all domains. Role Limitations due to Physical Health from 53.4 to 100.0, Role Limitations due to Emotional Problems from 57.6 to 100.0, and Social Functioning from 77.3 to 100.0; Bodily Pain from 78.5 to 98.9; and General Health from 76.6 to 88.5. Women with hyperemesis had lower birth-week QoL, although the difference was not statistically significant. Age showed no associations, whereas income correlated negatively with Bodily Pain (r=-0.46).
Conclusions: Maternal QoL declined toward delivery but improved substantially during the early postpartum period. Hyperemesis was associated with lower QoL, underscoring the importance of monitoring maternal well-being across pregnancy and postpartum recovery.

PV037 / #229

HIRSCHSPRUNG DISEASE MASQUERADING AS A NEUROMETABOLIC DISORDER: A CASE OF REVERSIBLE DEVELOPMENTAL REGRESSION SECONDARY TO MALNUTRITION

CLINICAL NUTRITION

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Background and Aims: Hirschsprung disease can present with systemic manifestations mimicking neurological disorders when severe malnutrition develops secondary to chronic bowel obstruction. We report a case where initial presentation suggested neurometabolic disease in a 5-month-old infant with failure to thrive and apparent neuroregression.
Methods: We describe a comprehensive case study including growth analysis, neurometabolic investigations, neuroimaging, gastrointestinal evaluation, and genetic testing with multidisciplinary team management.
Results: The infant presented with severe failure to thrive, dropping from 50th centile at 2 months to below 3rd centile by 5 months with weight plateauing at 5.2kg despite multiple formula changes. She developed developmental regression, hypotonia, severe anaemia (Hb 7.9g/dL), and profound hypoalbuminaemia (albumin 13g/L). Urine organic acid analysis initially suggested possible mitochondrial dysfunction. Follow-up brain MRI and spectroscopy showed no structural abnormalities, and the comprehensive neurometabolic workup provided inconclusive evidence for an underlying mitochondrial disorder. Significant family history of Hirschsprung disease in mother and maternal aunt prompted gastrointestinal investigation. Despite passing stools, rectal biopsy confirmed aganglionosis with hypertrophic submucosal nerves, with elevated stool alpha-1 antitrypsin indicating protein-losing enteropathy. Whole genome sequencing supported Hirschsprung disease diagnosis with no other genetic abnormalities. Following multidisciplinary management including loop ileostomy creation and comprehensive nutritional rehabilitation with blood transfusion, albumin replacement, and optimised feeding regimens, the patient demonstrated significant growth improvement and complete restoration of developmental milestones.
Conclusions: This case highlights the importance of considering gastrointestinal causes in infants presenting with failure to thrive and apparent neurometabolic disease, particularly given significant family history. Complete neurological recovery is achievable with appropriate surgical and nutritional intervention.

PV038 / #519

COMPARISON OF BRAZILIAN AND LATIN AMERICAN CHARTS FOR GESTATIONAL WEIGHT GAIN IN ADOLESCENTS: DATA FROM THE BRAZILIAN MATERNAL AND CHILD NUTRITION CONSORTIUM

CLINICAL NUTRITION

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Background and Aims: Inadequate gestational weight gain (GWG) is a risk factor for adverse perinatal outcomes, especially in adolescents. This study compared the Brazilian charts (BRC) and Latin American charts (LAC) to monitor GWG in pregnant adolescents.
Methods: Data from ten cohort studies (1990-2018) in the Brazilian Maternal and Child Nutrition Consortium (CONMAI). The sample included 1,564 adolescents (<20 years) and 8,805 observations. Weight, height and age were used to calculate pre-pregnancy body mass index-for-age (BMI/A). GWG was defined as the difference between weight at each visit and pre-pregnancy weight. GWG z-scores were generated using the BRC and LAC charts. The proportions (%) of adolescents with GWG below the 10th percentile (<P10) and above the 90th (>P90) were calculated for each chart.
Results: The charts diverged for the classification below P10 by pre-pregnancy BMI: underweight (11.8 %LAC vs. 5.4% BRC), overweight (11.2% LAC vs. 14.7% BRC), obese (15.9% LAC vs. 13.3% BRC). Differences were also observed in the proportion of underweight women classified above P90 from charts (26.3% BRC vs. 19.4% LAC). Conversely, for all other BMI categories, BRC classified fewer adolescents with GWG above P90, with the largest gap among obese (11.1% BRC vs 14.6% LAC).
Conclusions: We found meaningful discrepancies between the BRC and LAC charts in classifying gestational weight gain among adolescents, particularly across pre-pregnancy BMI categories. Because the BRC was not developed specifically for adolescents and no adolescent-specific GWG recommendations exist in Brazil, the LAC charts may offer a more appropriate alternative for monitoring GWG in this population.

PV039 / #352

DIETARY INFLUENCES ON PUBERTAL GROWTH, PROGRESSION, AND BODY COMPOSITION: A COMPARATIVE REVIEW OF HIGH-CALORIC AND HIGH-PROTEIN INTAKE

CLINICAL NUTRITION

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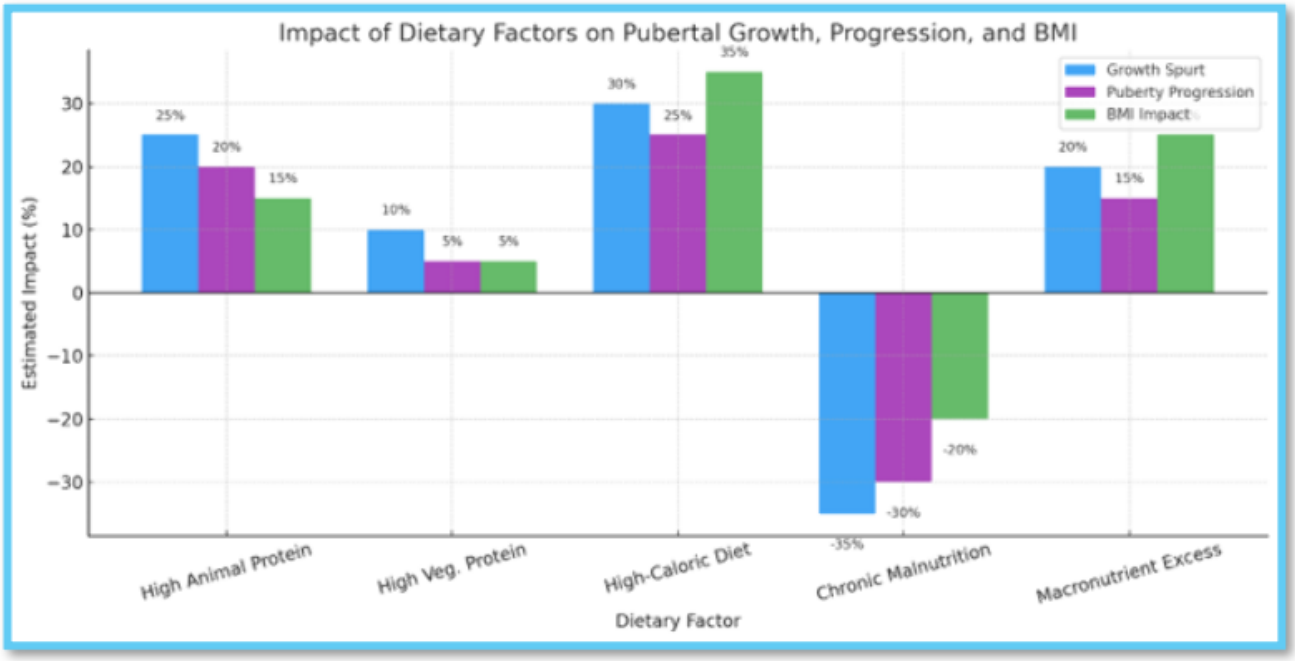
Background and Aims: he onset and progression of puberty are regulated by a complex interaction between genetic, hormonal, and environmental factors, with nutrition playing a particularly influential role. Emerging evidence indicates that both the type and quantity of dietary intake—especially caloric density and protein composition—can meaningfully affect the timing and magnitude of pubertal growth spurts, pubertal tempo, and body mass index (BMI) in children and adolescents. Understanding these relationships is essential for guiding nutritional strategies that support healthy developmental trajectories. **Objective:**
To assess the differential effects of high-caloric diets and high-protein diets (from animal and vegetable sources) on pubertal growth spurts, pubertal progression, and BMI, and to compare these with the developmental consequences of chronic malnutrition and mixed macronutrient excess.
Methods: Literature review of studies published (2000-2024)was conducted, including RCTs, cohort and longitudinal observational studies. Eligible studies examined dietary intake& pubertal parameters in children aged(6–18 years). Reported outcomes were categorized into three domains: pubertal growth spurts, pubertal progression, and BMI.
Results: High-caloric diets demonstrated the strongest overall effect, accelerating pubertal growth(≈30%)and progression(≈25%)while markedly increasing BMI (≈35%). High animal-protein intake linked to earlier pubertal onset and elevated IGF-1, resulting in increased growth(≈25%), faster progression (≈20%), and higher BMI(≈15%). Vegetable-based protein showed milder effects across all domains. Chronic malnutrition produced substantial delays in growth and pubertal tempo and decreased BMI.Mixed macronutrient excess had moderate positive effects on growth, progression,and
BMI.

Table: The effects of high-calorie versus high-protein diets on pubertal growth spurts and progression in children and adolescents.

Dietary Factor	Impact on Pubertal Growth Spurt (%)	Impact on Pubertal Progression (%)	Impact on BMI (%)
High Animal Protein Intake	25	20	15
High Vegetable Protein Intake	10	5	5
High-Caloric Diet	30	25	35
Chronic Malnutrition	-35	-30	-20
Mixed Macronutrient Excess	20	15	25



Conclusions: Nutritional composition significantly shapes pubertal development. While high-caloric,animal-protein diets may accelerate maturation, chronic undernutrition delays it. Tailored nutritional approaches are essential to promote healthy &timely pubertal development.

PV040 / #353

IMPACT OF ANIMAL VS. VEGETABLE PROTEIN INTAKE ON LINEAR GROWTH, WEIGHT GAIN, AND PUBERTAL DEVELOPMENT IN CHILDREN AND ADOLESCENTS: A 25-YEAR LITERATURE REVIEW

CLINICAL NUTRITION

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Background and Aims: Protein quality and dietary source are key determinants of linear growth, weight gain& pubertal development in children.While animal protein is traditionally regarded as superior in biological value and anabolic potential, vegetable protein gained relevance due to its health benefits and sustainability. This review summarizes and compares the impact of animal versus vegetable protein intake on growth parameters and pubertal timing over past25years
Methods: A structured literature search identified ten major studies published between(2000-2025), including longitudinal cohort studies, cross-sectional analyses, randomized controlled trials, and systematic reviews. Extracted data included participant characteristics, dietary patterns, and reported outcomes regarding linear growth, BMI, pubertal growth spurts, and timing of puberty.
Results: Higher animal protein intake was associated with earlier pubertal onset and more rapid pubertal growth. Increased consumption during early childhood(ages5–6) predicted higher BMI, earlier peak height velocity, and advanced puberty, likely mediated by stimulation of IGF-1 and adrenal androgens. Some evidence suggests;excessive total protein intake—particularly when nutritionally imbalanced—may contribute to linear growth restriction in specific contexts. Conversely, vegetable protein intake was linked to delayed pubertal timing, leaner body composition, and slower growth trajectories. Cohort data, including findings from the DONALD study and WCRF reviews, support associations between high plant-based protein intake in early childhood and delayed menarche or peak height velocity. Although less strongly associated with BMI increases, inadequate micronutrient planning in vegetarian diets may predispose children to
underweight.

Table: Comparative Effects of Animal vs. Vegetable Protein Intake on Growth and Pubertal Development

Parameter	Animal Protein Intake	Vegetable Protein Intake
Linear Growth	Mixed evidence: High intake may enhance early growth, but excess linked to stunting (Xiong et al., 2023)	Generally neutral or slightly positive effect on height (Gunther et al., 2010)
Weight Gain / BMI	Positively associated with increased BMI and adiposity (Hörnell et al., 2022; Hermanussen et al., 2023)	Weak or no association with increased BMI; may support leaner body mass (Hörnell et al., 2022)
Pubertal Growth Spurt	Associated with earlier growth acceleration and earlier peak height velocity (Gunther et al., 2010)	May delay pubertal growth spurt (Remer et al., 2010)
Timing of Puberty	Early onset of puberty, particularly with high intake at ages 5–6 (WCRF, 2020; DONALD Study)	Later onset of puberty when consumed in early childhood (WCRF, 2020; Cheng et al., 2010)
Hormonal Influence	Increases insulin-like growth factor-1 (IGF-1), promoting growth and earlier puberty (Remer et al., 2010)	May be associated with phytoestrogens (isoflavones) and higher fiber intake delaying puberty (Cheng et al., 2010)
Nutrient Density	High in essential amino acids, vitamin B12, heme iron, and zinc	Often lower in bioavailable nutrients; may require supplementation if diet is not diverse
Growth in Vegetarian Diets	Adequate growth possible if diet is well-planned; risk of underweight if unbalanced (Maguire et al., 2022)	Often associated with leaner phenotype; needs attention to protein quality and quantity

Conclusions: Animal and vegetable proteins exert distinct physiological effects on growth&puberty through hormonal and nutritional pathways. Balanced dietary planning is essential to support &optimize growth outcomes.

PV041 / #354

IMPACT OF ZINC SUPPLEMENTATION ON GROWTH IN CHILDREN AND ADOLESCENTS: A REVIEW OF EVIDENCE ACROSS THREE DECADES

CLINICAL NUTRITION

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Background and Aims: Zinc is essential micronutrient critical for growth,immune function,and cognitive development. Despite its importance, zinc deficiency remains prevalent worldwide, particularly in regions with high rates of malnutrition and malabsorption-disorders(Sub-Saharan Africa, South Asia,& part of Latin America). Deficiency can impair linear growth and weight gain, underscoring the need for interventions such as supplementation.
This review evaluated the impact of zinc supplementation on linear growth(height)&weight gain in children and adolescents over the past 30 years, assessing its role as a growth-promoting factor.
Methods: 30-year literature review of clinical and observational studies evaluating zinc supplementation effects on growth in children and adolescents.
Results: Eight studies encompassing >37,500 participants across diverse geographic&socioeconomic settings included.Zinc doses ranged from 5-30mg/day, with intervention periods of 6weeks-6months. Most studies reported significant improvements in linear growth, particularly among prepubertal children and those with baseline deficiencies, height gains ranging from 0.23 to 0.9 cm. Weight gains were modest, ranging from (0.14- 0.51kg) compared to controls. Effects were more pronounced in malnourished or low-income populations, highlighting zinc's potential to mitigate stunting. Variability in outcomes was influenced by baseline zinc status, age, intervention duration, and dietary context. Early studies showed limited benefits, whereas recent trials demonstrated more robust effects due to improved study designs and larger sample

Table: Review of Zinc Supplementation Studies on Growth in Children and Adolescents

Author(s), Journal, Year	Dose and Duration of Zinc Supplementation; Diagnosis and Number of Subjects	Main Findings and Outcomes
Friis et al., European Journal of Clinical Nutrition, 1997	Dose: 30 mg/day; Duration: 6 months; Rural Zimbabwean schoolchildren; 201 participants	Zinc supplementation improved mid-upper arm circumference but had no significant effect on height or weight gain. Link
Umeta et al., The Lancet, 2000	Dose: 10 mg/day; Duration: 6 months; Ethiopian infants; 200 participants	Zinc supplementation resulted in significant increases in length and weight compared to placebo. Link
Brown et al., American Journal of Clinical Nutrition, 2002	Various doses and durations; Prepubertal children; 33 studies	Zinc supplementation produced highly significant positive effects on height and weight gain in prepubertal children, especially among those with low baseline height-for-age or weight-for-age. Link
Imdad & Bhutta, BMC Public Health, 2011	Dose: 10 mg/day; Duration: 24 weeks; Children under 5 years in developing countries; 36 studies	Zinc supplementation led to a net gain of 0.37 cm in height compared to placebo, with a more pronounced effect when zinc was administered alone. Link
Rerksuppaphol & Rerksuppaphol, Pediatric Reports, 2017	Dose: 15 mg/day; Duration: 6 months; Thai school-aged children; 140 participants	Zinc supplementation enhanced linear growth in school-aged children. Link
Liu et al., Nutrients, 2018	Preventive zinc supplementation for ≥3 months; Pregnant women and children up to 5 years; 78 trials with 34,352 participants	Maternal zinc supplementation did not significantly increase birth weight. In children, zinc increased height (WMD: 0.23 cm) and weight (WMD: 0.14 kg), with stronger effects when supplementation started at age ≥2 years. Link
Monfared et al., BMC Pediatrics, 2023	Dose: 5–15 mg/day; Duration: 6–28 weeks; Healthy children over 2 years; 8 studies with 1,586 participants	Zinc supplementation significantly increased height (WMD: 0.9 cm) and weight (WMD: 0.51 kg) in healthy children over 2 years old. Link
TruHeight, 2024	Dose: Not specified; Duration: 6 months; Children and adolescents; Randomized controlled pilot study	The Growth Protein Shake, containing zinc among other nutrients, may support height growth in children and adolescents. Link

sizes.

Conclusions: Zinc supplementation supports height and weight gain in children and adolescents with deficiency or malnutrition. While not a universal growth factor, it is a low-cost, effective intervention for vulnerable populations. Future research should optimize dosing, assess long-term outcomes, and integrate zinc with broader nutritional strategies to maximize growth potential.

PV042 / #778

INTERMITTENT BOLUS NG TUBE FEEDING VS CONTINUOUS NG TUBE FEEDING IN PICU: A COMPARATIVE TRIAL

CLINICAL NUTRITION

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Background and Aims: Nutrition is a very crucial in pediatric Intensive care unit (PICU) settings as PICU caters the sickest patient cohort that needs appropriate nutrtion to combat the critical illness related catabolism. Most of the patients in PICU do not take oral feedinga and heavily dependent on either parenteral nutrtion or enteral nutrition through naso gastric or nasojejunal feeding tubes. The preferred way had always been a nasogastric enteral feeding in critically sick children in PICU.The NG tube feeding in sick children in PICU can be delivered by two methods, the easiest way to follow a bolus intermittent feeding regimen and another is to give continous NGT feeding through a feeding pump.In this study we discussed time to Full Feeds ,feeding Intolerance & Residuals,Growth and Development of the patients and clinical outcomes between these two methods.
Methods: feeding practices of 432 patients in pICU ina time period of 18 months had been noted down. They have randomely assigned to recieve any of the feeding method.
Results: Time to Full Feeds: our study showed there was no difference of time to full feed between these two methods in non ventilated patients and patients with single organ affection. In ventilated patients and patients with MODS continuous feeding took slightly shorter (approximately 0.64 to 1.28 days) to reach full enteral feeds. Feeding Intolerance & Residuals: Continuous feeding is associated with lower gastric residual volumes (GRV) and fewer interruptions in feeding,
Conclusions: continuous feeding was superior than bolus feeding in picu patients those who are ventilated or having MODS.

PV043 / #398

IMPACT OF SLEEP TIMING, DURATION, AND QUALITY ON GH–IGF-1 AXIS, LINEAR GROWTH, BONE HEALTH IN CHILDREN AND ADOLESCENTS: A REVIEW OF RECENT EVIDENCE

CLINICAL NUTRITION

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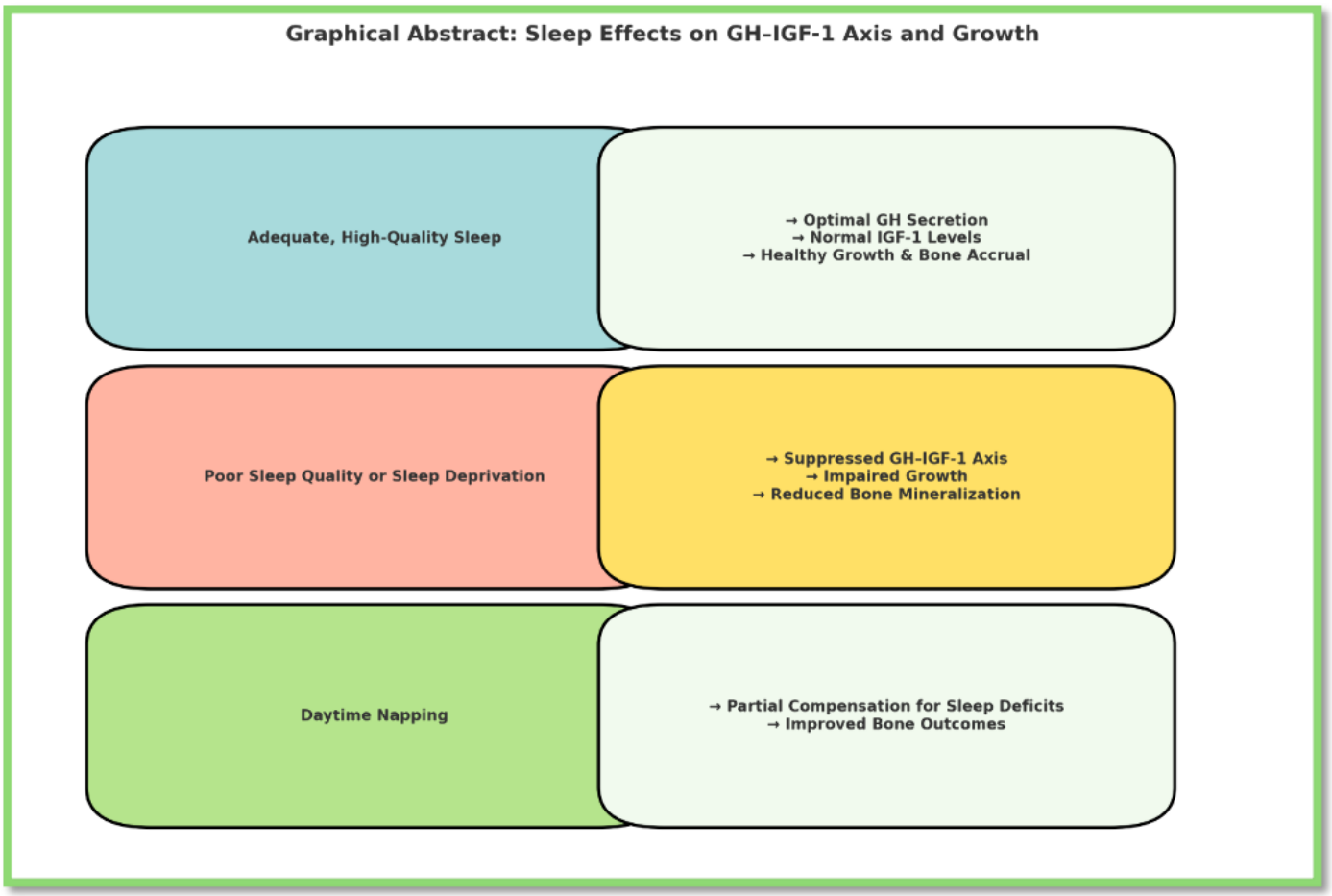
Background and Aims: Sleep is vital for regulating the growth hormone (GH)–insulin-like growth factor 1 (IGF-1) axis, essential for growth and bone development in children and adolescents. Poor sleep can hinder these processes. Aim:To summarizes 25 years of research on how sleep timing, duration, and quality affect the GH–IGF-1 axis and bone health in children, emphasizing clinical implications.
Methods: ** We reviewed studies from 1996-2025 that explored the relationship between sleep parameters and outcomes related to GH–IGF-1 secretion and growth in pediatric populations.
Results: Results: Numerous studies with over 10,000 participants have shown that adequate and high-quality sleep is vital for optimal growth hormone (GH) secretion, insulin-like growth factor 1 (IGF-1) levels, and bone health. Sufficient sleep in children and adolescents correlates with higher bone stiffness index scores, while poor sleep and extreme sleep durations negatively impact bone health. Untreated growth hormone deficiency can disrupt sleep architecture, but GH therapy may improve sleep quality. GH secretion peaks during slow-wave sleep (SWS) and rapid eye movement (REM) sleep, and even short-term sleep deprivation can significantly impair the GH–IGF-1 axis. Daytime napping can help counteract the adverse effects of poor nighttime sleep on bone health, though further research is needed to clarify GH recovery after sleep restoration.



Conclusions: Conclusion: Quality sleep is vital for growth and bone health in children and adolescents. Sleep deprivation can disrupt hormonal balance, while napping may help reduce its negative effects. More research is needed on the relationship between sleep patterns and health.

PV044 / #537

PREVALENCE OF ANAEMIA IN ASIAN CHILDREN WITH INFLAMMATORY BOWEL DISEASE

CLINICAL NUTRITION

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Background and Aims: Anemia is a common extraintestinal manifestation of inflammatory bowel disease (IBD). We investigated the prevalence of anemia and outcome at one year in children with newly diagnosed IBD in Malaysia.
Methods: A retrospective cohort study of children with IBD and with hemoglobin level at diagnosis and at one-year follow up at University Malaya Medical Centre, Malaysia. Anemia was defined as hemoglobin level < 11.5 g/dL.
Results: Of the 116 children with IBD (ulcerative colitis [UC] 53, Crohn's disease [CD] 48, inflammatory bowel disease-unspecified 7), 75 (66.4%) had anemia at diagnosis. Most patients (72.0%) had moderate anemia, while mild and severe anemia were noted in 18.7% and 9.3%, respectively. Prevalence of anemia was higher in CD than in UC (52.0% vs. 40.0%, p=0.012). The most common type of anemia was microcytic anemia (84.8%). At one-year follow up, 43 children who had anemia improved with no anemia, 18 remained anemic while four who were initially not anemic developed anemia. No significant difference between phenotype of IBD and persistent anemia at one year follow up was observed (CD vs. UC, P=0.191).
Conclusions: Two-thirds of children with newly diagnosed IBD had anemia at diagnosis. While anemia improved in majority of children, a significant minority had persistent anemia one year after diagnosis. Close follow up is necessary in these children.

PV045 / #149

PREVALENCE AND PREDICTORS OF SARCOPENIA IN ASIAN CHILDREN WITH CROHN'S DISEASE

CLINICAL NUTRITION

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Background and Aims: Crohn's disease (CD) affects the musculoskeletal health of children resulting in sarcopenia. Prevalence of sarcopenia in Asian children with CD remains unknown. We investigated the prevalence and predictors of sarcopenia in Malaysian children with CD.
Methods: A retrospective review on all children with newly diagnosed CD from 2015 to 2024 in University Malaya Medical Centre with abdominal magnetic resonance imaging (MRI) and dual energy x-ray absorptiometry (DXA) scans performed. Total Psoas Muscle Area (tPMA) at intervertebral level L4/L5 was calculated by two assessors. Sarcopenia was defined by age and sex-matched tPMA Z-score <-2. Suboptimal and low bone mineral density (BMD) were defined as lumbar BMD Z-scores <-1 and < -2 respectively.
Results: 25 children with newly diagnosed CD (male 56.0%, mean age at diagnosis 9.7 years +/- 3.2, mean wPCDAI at diagnosis 62.9 +/- 23.8), MRI scans done at median 2.0 (IQR 10.0) months after diagnosis. Mean tPMA Z-score at L4/L5 was -2.9 +/-1.3. ICC was excellent at L4/5 (0.980, 95% CI 0.914~0.995). Prevalence of sarcopenia was 68.0%. 56.0% of children had concurrent suboptimal BMD and sarcopenia, while 28% of children had concurrent low BMD and sarcopenia. There was no significant difference in mean tPMA Z-scores between genders (p=0.186). Lower BMD Z-scores (p=0.009) and BMI-for-age Z-scores (p=0.035) predicted lower tPMA Z-scores independently.
Conclusions: Sarcopenia is prevalent in Malaysian children with CD, with a notable portion having concurrent suboptimal BMD. Lower BMD and BMI-for-age Z-scores predicted sarcopenia independently. Early musculoskeletal assessments and targeted nutritional interventions to optimize growth and long-term outcomes in this population is necessary.

PV046 / #346

IT'S ALL ABOUT THE PHOSPHATE: HYPERCALCIURIC HYPERCALCEMIA AS A PRESENTING SIGN OF DIETARY PHOSPHORUS DEFICIENCY IN LATE PRETERM NEONATES

CLINICAL NUTRITION

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Background and Aims: Idiopathic infantile hypercalcemia is usually associated with increased $1,25(OH)_2D_3$ levels, increased intestinal calcium and phosphorous (Pi) absorption, leading to hypercalciuric hypercalcemia with suppressed PTH levels. This is described in hypervitaminosis D and in primary tubular Pi leak conditions, but not as the presenting sign of dietary Pi restrictions. The higher requirements of preterm infants for Pi and calcium require breast milk fortification. However, whether late preterm infants need such fortification is under debate. We describe changes in calcium-phosphorus homeostasis in moderately to late preterm infants who presented with hypercalciuric hypercalcemia, which responded to phosphate supplementation.
Methods: Retrospective case series of neonates who were evaluated for hypercalciuric hypercalcemia.
Results: The 6 infants were born at a gestational age of 32-35 weeks, birth weight 1700-2120 gram. All were exclusively breast milk fed and presented at post-natal age 6-19 days with hypercalcemia (11.2-13 mg/dL), hypercalciuria (U-Ca/Creat: 1.73- 3 mg/mg) and suppressed PTH levels. Before intervention serum Pi levels were low (3.5-5.5 mg/dL) and alkaline phosphatase ranged 357-905 U/L. All had unmeasurable urinary Pi levels. Pi supplementation was administered until reaching measurable urinary phosphate levels, resulting resolution of hypercalciuria, normalization of serum calcium and increase in suppressed PTH levels. Pi supplementations were gradually reduced once dietary Pi intake increased.
Conclusions: Hypercalciuric hypercalcemia with suppressed PTH and elevated $1,25(OH)_2D_3$ can be an early marker of dietary Pi deficiency. Pi supplementation led to normalization of calcium-phosphate balance, potentially preventing subsequent bone and kidney abnormalities. A larger prospective study is warranted to validate and guide future nutritional recommendations.

PV047 / #134

NUTRITIONAL BLOOD TESTING IN NG- AND PEG-FED CHILDREN: EVIDENCE AND PRACTICE

CLINICAL NUTRITION

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Background and Aims: Children receiving enteral nutrition through percutaneous endoscopic gastrostomy (PEG) or nasogastric (NG) feeding are at potential risk of nutrient imbalance due to limited oral intake and variable absorption. Nutritional blood testing provides objective monitoring of micronutrient status and helps ensure adequacy of prescribed feeds. This review aimed to evaluate nutritional blood test results in a cohort of tube-fed children over a five-year period.
Methods: A retrospective review was performed on 20 PEG- and NG-fed children (11 males, 9 females) aged 5–16 years. All nutritional blood investigations carried out over five years were analyzed, including hemoglobin, ferritin, vitamin D, vitamin B12, folate, zinc, copper, electrolytes, liver function, albumin, and inflammatory markers. Verbal consent was obtained from parents or guardians to review the results.
Results: All parameters were within age-appropriate reference ranges. Hemoglobin, ferritin, and trace elements indicated adequate iron and micronutrient status. Vitamin D, B12, and folate levels were normal, with most values trending toward the higher end of the normal range. Electrolytes, liver function tests, and albumin were also within expected limits. No deficiencies or biochemical abnormalities were identified during the study period.
Conclusions: The findings confirm that current enteral feeding regimens provide sufficient nutritional support. Given the consistently normal results, the frequency of routine nutritional blood testing can be safely reduced once stability is established. Testing should be performed only when clinically indicated, minimizing unnecessary procedures and discomfort for children while maintaining effective nutritional surveillance.

PV048 / #740

AN STUDY OF ETIOLOGICAL AND CLINICAL PROFILE OF ANEMIA IN CHILDREN AGE BETWEEN 1 AND 12 YEARS IN ESTERN INDIA

CLINICAL NUTRITION

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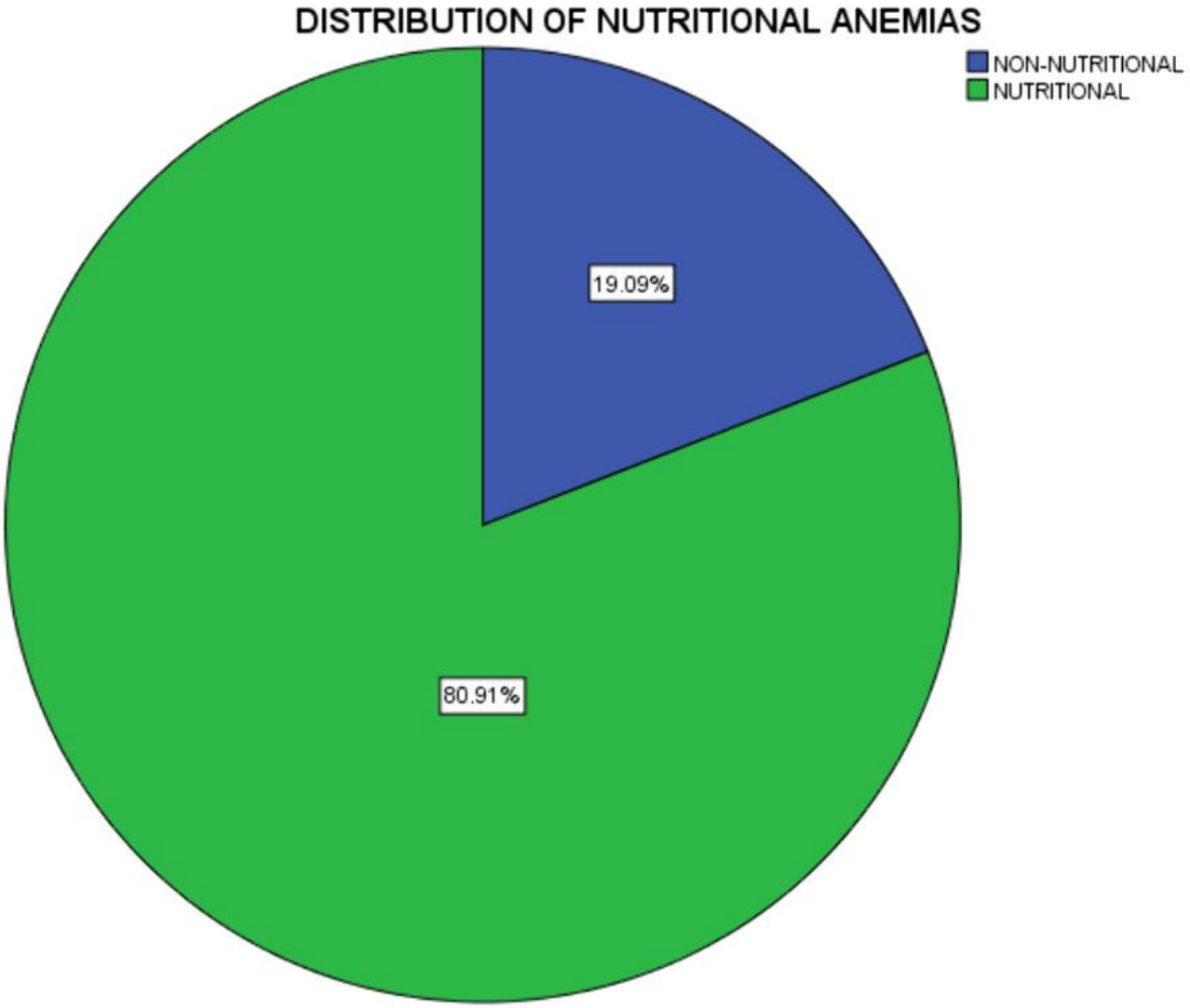
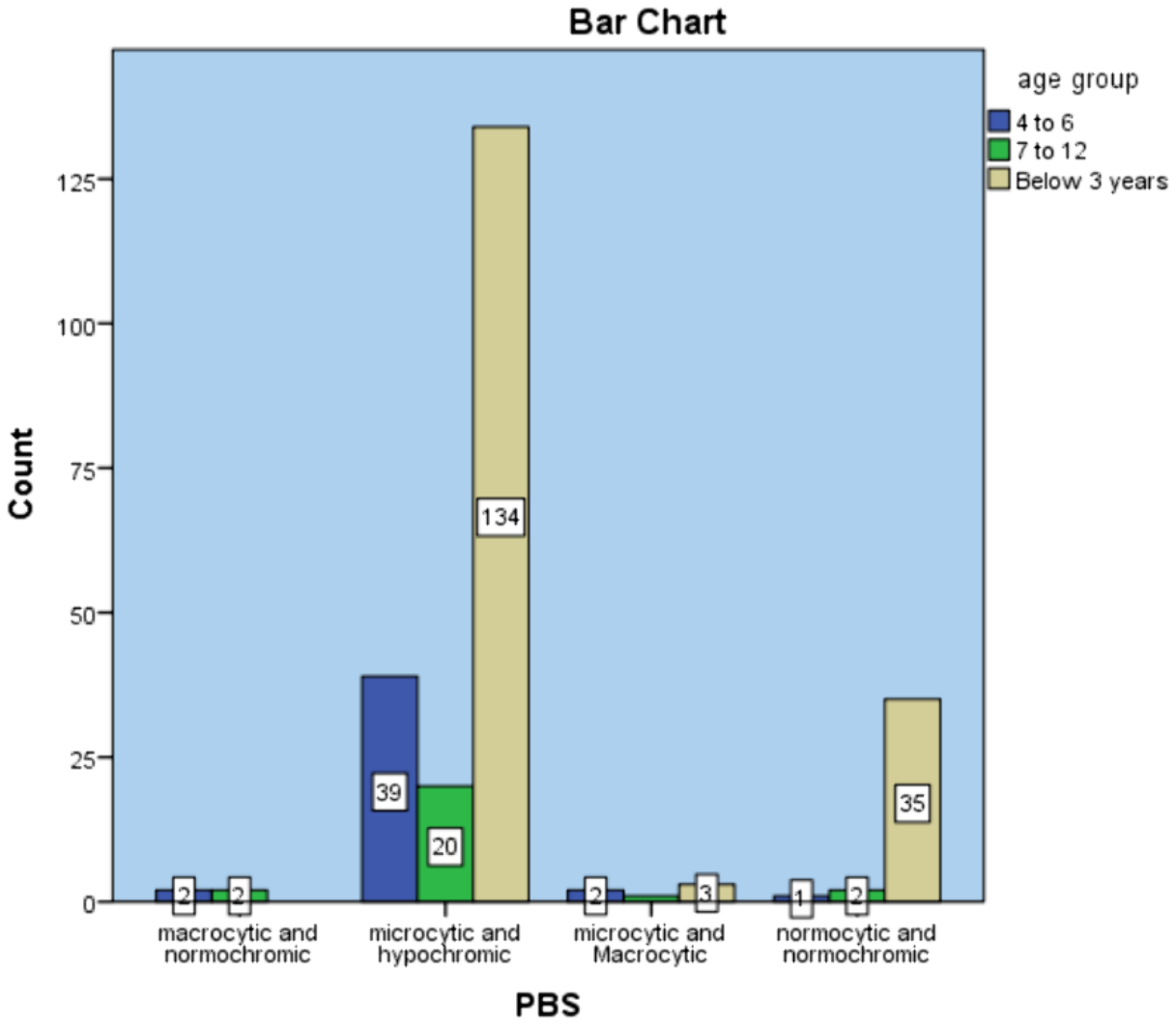
Background and Aims: Global and National Prevalence World Health Organization (WHO) estimates that anemia affects a large percentage of children under 5 worldwide. In India, high prevalence rates persist due to nutritional deficiencies and infections. **Importance in Eastern India** Eastern Indian states (e.g., Bihar, West Bengal, Jharkhand, Odisha) have higher rates of poverty, malnutrition, and infectious diseases. Regional studies suggest notable variation in anemia prevalence and causes compared with other areas. **Aims** To Study occurrence of anemia in paediatric (1year to 12 years) age group and classify these morphologically. To study etiology of anemia in paediatric (1year to 12 years) age group with clinical and etiological correlation.
Methods: All the eligible children admitted in the paediatric ward and PICU in Katihar Medical College, Bihar, India were enrolled. Blood sample was sent immediately to the laboratory for haematological testing.
Results: Out of total 241 cases of anemia, it was more common in boys (60.2%) and most afflicted children (71.4%) were younger than three years old. The most prevalent grade of anemia was moderate (60.2%), and the most common blood image was microcytic hypochromic morphology (83%). The most common cause is iron deficiency anemia (63.5%) among nutritional anemia (80.9%), followed by beta thalassemia
(24.9%).


DISTRIBUTION OF NUTRITIONAL ANEMIAS
NON-NUTRITIONAL
NUTRITIONAL
19.09%
80.91%



Conclusions: The present study demonstrates that anemia in children aged 1–12 years in Eastern India predominantly affects boys and those under three years of age, with moderate anemia being most frequent. microcytic hypochromic morphology reflects iron deficiency as the principal etiology. An early nutritional interventions, screening programs, and targeted genetic counseling strategies needs.

PV049 / #349

CHOOSING THE IDEAL NURSERY FORMULA: A COST-EFFECTIVE STRATEGY TO PREVENT ALLERGY

CLINICAL NUTRITION

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Background and Aims: Abstract Background: Cow milk allergy affects 1-6% of infants, often following transient cow milk formula (CMF) exposure in the nursery among exclusively breastfed infants. Transient use of the more expensive Amino acid formula (AAF) supplementation was found to decrease the rate of allergies. **Aims:** This study aimed to determine the long-term cost-effectiveness of using Amino Acid Formula (AAF) versus standard cow milk formula (CMF) for supplementation in the nursery.
Methods: Methods: A decision-analytic Markov model was constructed, comparing transient CMF exposure with AAF supplementation in healthy term neonates whose mothers intended to breastfeed exclusively. Primary outcomes were expected cost, quality-adjusted life years (QALY) and incremental cost-effectiveness ratio (ICER).
Results: Results: The AAF strategy was cheaper, resulting in lower expected discounted cow milk allergy-related costs (37.26 NIS vs. 369.96 NIS per infant) and had a higher QALY (4.769 vs. 4.756) compared to CMF. The ICER of -27,276.6 NIS per QALY indicated that AAF dominated CMF. Sensitivity analysis confirmed the robustness of the findings, with AAF remaining cost-effective in over 90% of simulations.
Conclusions: Conclusions: AAF supplementation in the nursery for exclusively breastfed infants was found to be the dominant strategy, being both less costly and more effective over a 5 year period compared to standard CMF. These findings support a policy shift toward prioritizing AAF as a default formula in nurseries for newborns of mothers who intend to exclusively breastfeed in order to improve infant outcomes and achieve substantial long-term healthcare cost savings.

PV050 / #173

BLENDED DIET A CONCEPT ANALYSIS.

CLINICAL NUTRITION

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Background and Aims: Many terms are used to describe Blended Diet and there is no universal agreement on what constitutes one. This paper aims to define the concepts of Blended Diet and provide the reader with two clear definitions for Homemade Blended Diet & Commercial Blended Diet.
Methods: Rodgers' evolutionary concept analysis was selected as the framework to explore what is common to Blended Diet. This paper draws on key elements of a Blended Diet that are commonly reported in literature including identification of surrogate terms, attributes, antecedents and consequences. Seven online databases were searched for articles pertaining to BD use in adults and children. The inclusion criteria were kept broad to allow for a holistic view of the concept of BD to be established.
Results: This concept analysis examines the published data on Blended Diet, which the author has concluded as having two main definitions concerning different elements that often lack a clear differentiation within the literature. Homemade Blended Diet refers to everyday home foods blended for personal use to allow the consistency to be safely administered as enteral nutrition. The second definition Commercial Blended Diet is defined as food being produced outside of the home at commercial scale which is ready to use or requires minimal manipulation.
Conclusions: The two types of Blended Diet have distinctively different characteristics and show a clear need to distinguish between them. The main reason for its use is multifunctional. Higher rates of success were seen when supported by healthcare professionals' input.

PV051 / #554

GROWTH IMPROVEMENT AND RESPIRATORY STABILIZATION THROUGH NUTRITIONAL INTERVENTION IN A RARE NEUROMUSCULAR DISORDER

CLINICAL NUTRITION

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Background and Aims: Salih congenital myopathy is a rare neuromuscular disorder characterized by early hypotonia, progressive muscle weakness, and restrictive respiratory impairment. Nutritional deficits frequently worsen functional decline. We present the case of a pediatric patient in whom personalized nutritional rehabilitation contributed significantly to improvements in growth and respiratory status.
Methods: We report the case of a 12-year-10-month-old girl diagnosed with Salih congenital myopathy, neuromuscular thoracolumbar lordoscoliosis surgically corrected, restrictive ventilatory dysfunction, and nocturnal hypoventilation on BiPAP. Between 2022 and 2024, her course was unfavorable, with weight stagnation, progressive muscle atrophy, and a ~10% decline in forced vital capacity (FVC). Clinically: generalized hypotonia, marked muscle hypotrophy with limited active movements, postoperative spinal rigidity, reduced anteroposterior chest diameter. Paraclinical findings included elevated CK and LDH, eosinophilia, high fecal zonulin and hyper-IgE levels. Given the neuromuscular disease, respiratory restriction, and nutritional vulnerability, a personalized nutritional plan was initiated, emphasizing a hypercaloric, high-protein diet tailored to identified intolerances and monitored within a multidisciplinary program.
Results: Following the initiation of individualized nutritional therapy, the patient achieved an ~34% weight increase over 20 months, and a ~6% improvement in FVC. These changes correlated with better muscle tone, enhanced exercise tolerance, and improved quality of life. Respiratory stability was maintained with nocturnal BiPAP, and functional gains were supported by ongoing physiotherapy.
Conclusions: This case highlights the pivotal role of targeted nutritional intervention in the multidisciplinary management of rare neuromuscular disorders. Optimizing nutrition in these cases can significantly enhance growth trajectories, support respiratory function, and positively influence long-term outcomes.

PV052 / #555

HEMATOCHEZIA IN INFANCY: NAVIGATING FORMULA CHOICE IN AN ATOPIC CHILD - A CASE REPORT

CLINICAL NUTRITION

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Background and Aims: Gastrointestinal bleeding in infancy often necessitates reassessing formula tolerance and composition. This case reports an otherwise thriving, atopic 1-year-old boy with hematochezia unresponsive to several formulas, underscoring the importance of formula evaluation in clinical decision-making.
Methods: A 1-year-old male with a history of five episodes of acute bronchiolitis within six months and intermittent wheezing between episodes was evaluated. Blood-streaked stools appeared at 8 months while the child was receiving mixed feeding (breast milk + formula). Several standard formulas were tried without improvement, after which the family introduced soy milk, reaching an intake of approximately 1 L/day. Clinical examination showed a well-appearing, paratrophic infant, with intermittent wheezing, mild pharyngeal congestion, and generalized mild lymphadenopathy.
Results: Laboratory studies revealed microcytic hypochromic anemia, with normal inflammatory markers, hepatic and renal function, immunoglobulins, urine studies, and negative infectious serology. Allergy IgE testing was negative. Given the persistence of symptoms on multiple standard formulas and the high daily intake of soy milk, nutritional intervention focused on removing soy from the diet and introducing an extensively hydrolyzed formula, limited to 500 mL/day. Age-appropriate complementary feeding was reinforced, with particular attention to adequate protein and fiber intake, especially during periods of diarrheal stools, along with routine vitamin D prophylaxis.
Conclusions: This case highlights the central role of formula selection in infants presenting with gastrointestinal symptoms and recurrent wheezing. Careful evaluation of feeding history and timely transition to an appropriate formula are essential for improving tolerance, preventing complications, and supporting healthy growth.

PV053 / #650

A DECADE OF KETOGENIC DIET USE IN CHILDREN: EXPERIENCE FROM A TERTIARY HOSPITAL

CLINICAL NUTRITION

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Background and Aims: Around 25% of epilepsies are refractory to pharmacological treatment. The ketogenic diet (KD) is an alternative therapeutic option for these patients and for children with specific metabolic disorders. This study aimed to analyze the experience with the KD in our unit over the past ten years and to evaluate its efficacy and tolerability in patients followed at the Pediatric Nutrition Unit of Hospital Gregorio Marañón.
Methods: A retrospective observational study was conducted from July 2015 to July 2025 through review of medical records of patients with refractory epilepsy who initiated KD. The diet was prescribed by nutrition specialists in collaboration with an experienced dietitian.
Results: Forty patients were included, with a mean age of 8.8 years; 50% were male. Most were diagnosed with refractory epilepsy, and three had metabolic disorders (GLUT1 deficiency or PDH deficiency). Diet initiation was performed at home in 80% of cases. Most patients maintained the KD for more than two years due to good clinical response and a low rate of adverse events. The most common initial ketogenic ratios were 4:1 or 3:1 depending on age, with reductions during follow-up. Overall, 70% of patients showed improvement in seizure control, and up to 50% exhibited cognitive or behavioral improvements. Constipation and hypercalciuria were the most frequent adverse effects.
Conclusions: The ketogenic diet is an effective and well-tolerated treatment for children with refractory epilepsy, providing significant seizure reduction and cognitive benefits. No severe adverse events were observed. Early consideration of the KD should be encouraged in eligible patients.

PV054 / #613

COW'S MILK PROTEIN ALLERGY AND CONGENITAL HEART DISEASE: A FREQUENT ASSOCIATION?

CLINICAL NUTRITION

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Hospital Universitario San Pedro, Pediatría, Logroño, Spain

Background and Aims: Cow's milk protein allergy (CMPA) is the most common food allergy in infants. The prevalence is estimated to be less than 1%. In many cases, the suspected diagnosis is based on nonspecific digestive symptoms. These symptoms are common in patients with congenital heart disease, although they can be caused by multiple factors. The objective of this study is to determine the prevalence of CMPA in patients with congenital heart disease.
Methods: A single-center, observational, prospective study was conducted between January 2022 and December 2024 on patients with congenital heart disease. The diagnostic criteria for CMPA published in the 2012 guidelines of the ESPGHAN and updated in 2023 were used. The nutritional risk of congenital heart disease was collected in accordance with the latest consensus document of the Spanish Association of Pediatrics from 2023.
Results: We included twenty-one patients (61.9% female). The incidence of suspected CMPA was 23.8% (n=5), with vomiting being the leading symptom. The median age of symptom onset was 12 days after birth, appearing always in situations of low cardiac output ($p<0.001$). No provocation test was performed in any case, and the diagnosis of CMPA could not be confirmed. The mean exclusion time was 4 months, with the tolerance acquisition test being negative in all cases.
Conclusions: This study suggests that, in the population with congenital heart disease there is a tendency to overdiagnose CMPA. Knowing that digestive symptoms may be due to other pathophysiological conditions could reduce misdiagnosis and the development of comorbidity that could result from unnecessary exclusion diets.

PV055 / #101

POOR WEIGHT GAIN AND HYPERCALCEMIA: A CASE REPORT

CLINICAL NUTRITION

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University Of Texas Health Science Center At Houston, Houston, United States of America

Background and Aims: Hypercalcemia is not a common finding in the newborn period. It requires a full workup to determine its etiology and plan the therapy.
Methods: Case description: A forty-eight-day-old infant presented with malnutrition and poor feeding and was found to have an elevated level of Calcium. The patient was born term and large for gestational age at 4.43kg. She had a short stay in the Neonatal ICU for respiratory failure. She was exclusively fed expressed breast milk. On physical examination, multiple, firm, mobile, subcutaneous, and erythematous nodules were found on the nape of her neck. This mass was initially a soft, skin-colored bump at birth that had hardened by 1 week of life, The patient had a calcium level of 21 mg/dl . The PTH was appropriately suppressed at less than 6.3 pg/ml, alkaline phosphatase 192 IU/L, creatinine 0.54 mg/dl, and a normal Vitamin D level. An abdominal ultrasound was obtained and showed mild bilateral renal pelviectasis but no signs of nephrocalcinosis. The patient was treated with a hyperhydration, furosemide, and prednisolone course. Since the mother reported the history of hypercalcemia, the breast milk was stopped, and the Calcilo XD formula was started. The patient's calcium improved after three days, and the Prednisolone was weaned over 6 days.
Results: Hypercalcemia in infancy should include the differential diagnosis of poor weight gain in children
Conclusions: The detailed physical examination of the patients, which showed subcutaneous fat necrosis, lead to the etiology of hypercalcemia.

PV056 / #466

INSULIN-LIKE GROWTH FACTOR-1 AND BONE AGE MATURATION IN CHILDREN UNDERGOING GROWTH HORMONE THERAPY: ANALYSIS OF THE LG GROWTH STUDY

DIABETES AND/OR OTHER ENDOCRINE DISEASES & NUTRITION

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Background and Aims: Elevated insulin-like growth factor-1 (IGF-1) levels have been associated with earlier pubertal onset and bone maturation; however, limited data are available on how IGF-1 increases during growth hormone (GH) therapy affect bone age (BA) advancement in children with idiopathic growth hormone deficiency (IGHD), idiopathic short stature (ISS), and small for gestational age (SGA).
To evaluate whether increases in IGF-1 SDS following GH therapy are associated with the risk of bone age advancement, defined as bone age/chronological age (BA/CA) > 1, across diagnostic groups
Methods: This multicenter observational study included 1,944 children from the LG Growth Study registry between 2020 and 2024. Proportional hazards regression models estimated hazard ratios (HRs) for BA advancement associated with IGF-1 SDS, adjusted for height and weight SDS. Kaplan-Meier analyses evaluated time to BA/CA > 1 by diagnostic group.
Results: Each unit increase in IGF-1 SDS was associated with an increased risk of BA advancement in the total cohort (HR 1.24, 95% CI 1.15–1.33, $p < 0.001$), with consistent findings in males (HR 1.27, 95% CI 1.14–1.41) and females (HR 1.23, 95% CI 1.12–1.35). Compared to IGHD, children with ISS (HR 1.63, 95% CI 1.26–2.11) and SGA (HR 2.15, 95% CI 1.82–2.55) demonstrated higher risks of BA advancement after adjustment. Kaplan-Meier analyses showed the fastest progression to BA/CA > 1 in SGA patients, followed by ISS and IGHD.
Conclusions: Careful monitoring of bone maturation and individualized GH dosing strategies are essential to optimize growth outcomes while minimizing the risk of early epiphyseal closure in this population.

PV057 / #216

VITAMIN INTAKES AMONG LACTATING WOMEN IN LATVIA: CALCULATED VS. RECOMMENDED

DIABETES AND/OR OTHER ENDOCRINE DISEASES & NUTRITION

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Background and Aims: The Energy and Nutrition Recommendations for the Population of Latvia were updated in October 2025 and, compared to the 2017 Edition, emphasize a higher daily recommended intake of vitamins for lactating women (Table 1). This study assessed whether the calculated vitamin intakes for lactating women in Latvia aligns with the updated national dietary recommendations. **Table 1. Comparison Between Recommended Daily Vitamin Intakes for Lactating Women**

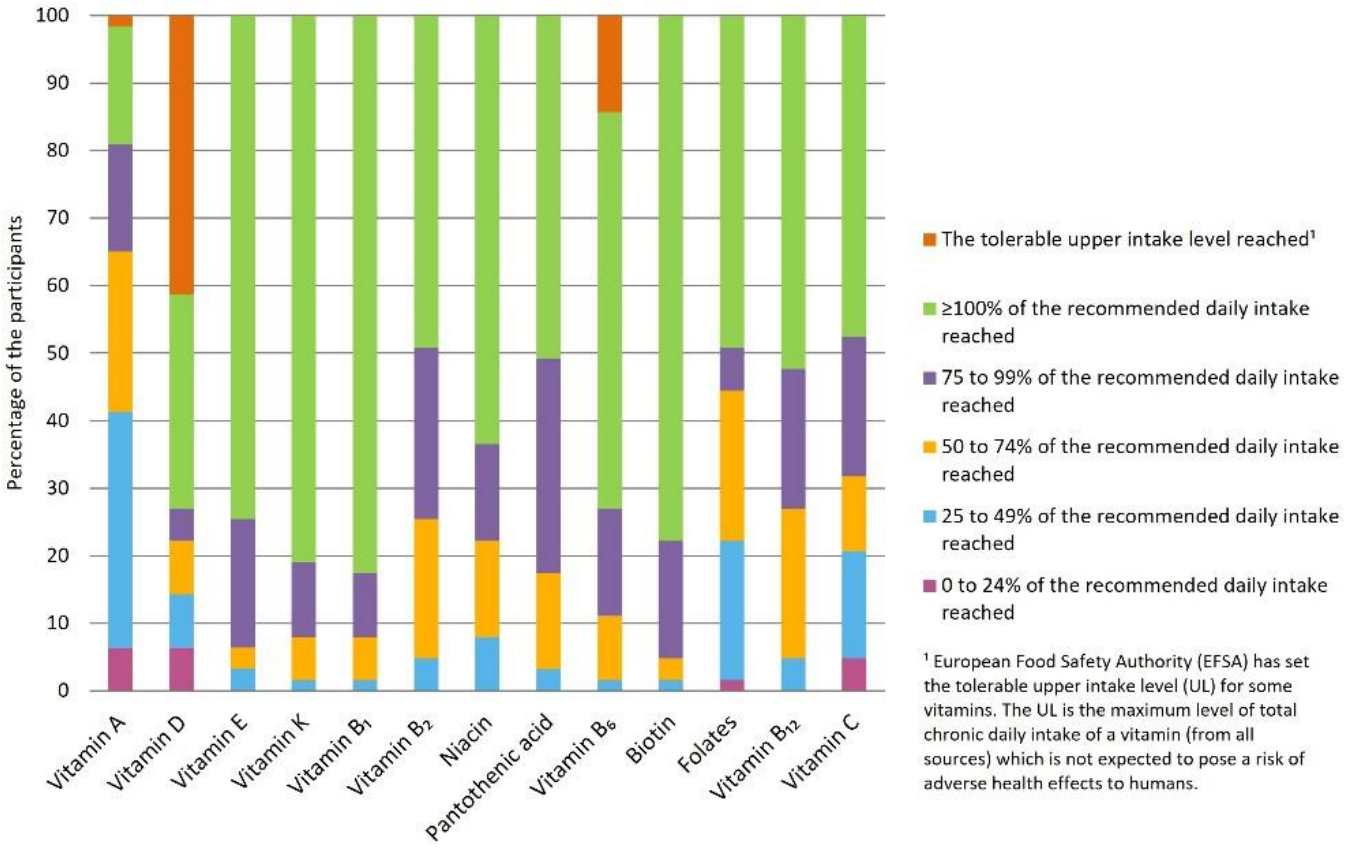
Vitamin, unit	Recommended daily intake, 2017 Edition	Recommended daily intake, 2025 Edition
Vitamin A, µg	1100	1400
Vitamin D, µg	10	10
Vitamin E, mg	11	11
Vitamin K, µg	NR[1]	65
Vitamin B_1, mg	1.6	1.2
Vitamin B_2, mg	1.7	2.0
Niacin, mg	NR	19
Pantothenic acid, mg	NR	7
Vitamin B_6, mg	1.5	1.7
Biotin, µg	NR	45
Folates, µg	500	490
Vitamin B_{12}, µg	2.0	5.5
Vitamin C, mg	100	155

[1] **No recommendation provided**

Methods: Dietary data collected from 63 lactating women were obtained from datasets deposited in the Latvian National Research Data Repository Dataverse.lv (Aumeistere *et. al.*, doi.org/10.71782/DATA/D2OABD), including average daily vitamin intakes calculated from 72-hour food diaries and reported dietary supplement use.

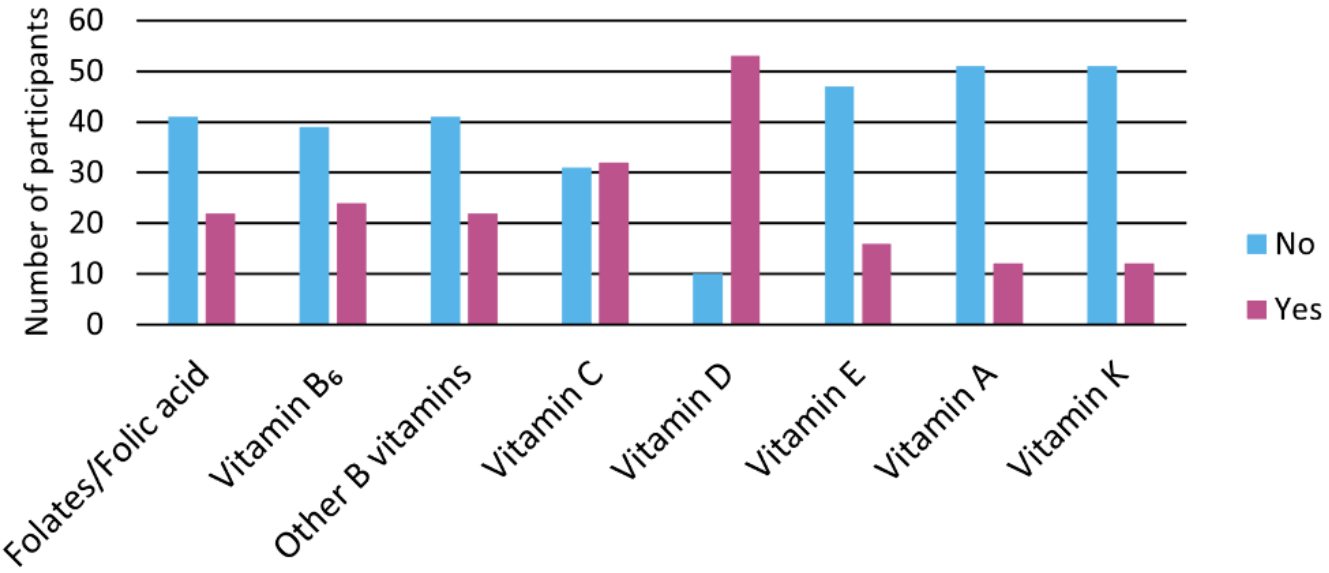
Results: A substantial proportion of participants failed to reach the recommended daily intake of vitamin A, vitamin B_2, folates and vitamin C (Figure 1).

Figure 1. Daily Vitamin Intakes Among Lactating Women in Latvia in Comparison to Dietary Recommendations (n = 63)



Most often reported dietary supplements were vitamin D (n = 53, 84%) and vitamin C (n = 32, 51%) (Figure 2).

Figure 2. Reported Dietary Supplement Consumption (n = 63)



Conclusions: Results highlight the need to strengthen dietary counselling and public health strategies in Latvia to align lactating women's vitamin intakes with updated dietary recommendations.

13th International Conference on Nutrition & Growth
April 9-11, 2026 | Prague, Czech Republic

PV058 / #366

DIETARY INFLUENCE OF FRUITS AND VEGETABLES ON THYROID AND ADRENAL FUNCTION

DIABETES AND/OR OTHER ENDOCRINE DISEASES & NUTRITION

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Background and Aims: The endocrine system is intricately regulated by nutrients and bioactive compounds found in everyday foods. Nutritional strategies—particularly those involving plant-based foods—can offer significant modulatory effects, especially on the thyroid and adrenal glands.
To highlight and synthesize recent findings on how specific fruits and vegetables influence endocrine health, with a focus on thyroid and adrenal gland function.
Methods: A targeted review of functional foods and plant-derived nutrients was conducted, categorizing fruits and vegetables based on their primary endocrine targets (thyroid or adrenal glands) and mechanisms of action. Particular attention was given to compounds such as goitrogens, phytoestrogens, antioxidants, and micronutrients like B vitamins and vitamin C.
Results:

Fruits & Vegetables That Influence the Endocrine System (Thyroid + Adrenal)

Food	Target Gland	Effect	Mechanism / Nutrients
Cruciferous vegetables (broccoli, kale)	Thyroid	🚫 May suppress if excess	Goitrogens inhibit iodine uptake; especially raw or in iodine-deficiency
Soy foods (edamame, tofu)	Thyroid	🚫 Estrogenic; may disrupt	Isoflavones mimic/block estrogen; can affect thyroid if iodine is low
Flaxseed	Thyroid & Reproductive	🔁 Modulates estrogen	Rich in lignans (phytoestrogens); supports estrogen balance
Pomegranates	Adrenal & Reproductive	✅ Hormone modulating	Antioxidants may reduce estrogen dominance and support testosterone
Avocados	Adrenal	✅ Supports cortisol synthesis	Rich in B5, B6, magnesium, and fats – all vital for adrenal steroidogenesis
Citrus fruits (oranges, lemons)	Adrenal	✅ Stress resilience	High in vitamin C, essential for adrenal hormone production
Leafy greens (spinach, kale)	Adrenal	✅ Anti-inflammatory	Magnesium, folate support adrenal stress regulation
Sweet potatoes	Adrenal & Thyroid	✅ Balances blood sugar & supports progesterone	Complex carbs, beta-carotene, stabilize cortisol
Bananas	Adrenal & Neuroendocrine	✅ Eases anxiety, supports neurotransmitters	High in B6, potassium; supports dopamine and cortisol balance
Blueberries	Adrenal	✅ Antioxidant stress relief	Polyphenols reduce oxidative load on adrenal glands
Licorice root *(herbal)*	Adrenal	⚠️ Prolongs cortisol action	Inhibits cortisol breakdown; useful short-term, but can raise blood pressure

Cruciferous vegetables (e.g., broccoli, kale) contain goitrogens that may suppress thyroid function, particularly when consumed raw and in the context of low iodine intake. Soy products are rich in isoflavones, acting as phytoestrogens that can interfere with estrogen and thyroid hormone pathways. Flaxseed and pomegranates modulate sex hormones and support adrenal and reproductive balance through lignans and antioxidants. Adrenal-supportive foods such as avocados, citrus fruits, leafy greens, and bananas provide essential co-factors (vitamin C, B5, B6, magnesium) for stress hormone synthesis and regulation. Sweet potatoes stabilize blood glucose and indirectly support adrenal-cortisol rhythm and progesterone balance. Blueberries offer potent antioxidant protection for adrenal tissues. Licorice root is noteworthy for extending cortisol activity by inhibiting its breakdown—

beneficial in moderation but contraindicated in hypertension.

Conclusions: Dietary choices significantly impact the function and resilience of the endocrine system. Incorporating nutrient-dense, endocrine-supportive fruits and vegetables can aid in maintaining hormonal equilibrium.

PV059 / #559

BELULANG GRASS (ELEUSINE INDICA (L.) GAERTN) EXTRACT HAS A POTENT OF A-GLUCOSIDASE INHIBITOR ACTIVITY

DIABETES AND/OR OTHER ENDOCRINE DISEASES & NUTRITION

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Background and Aims: Diabetes mellitus is a chronic disease that occurs when the pancreas does not produce enough insulin or when the body cannot use the insulin that has been made effectively. Long-term use of synthetic anti-diabetic drugs such as acarbos can cause several side effects. Therefore, using natural medicines as an alternative therapy is more considered because of their potential and minimal side effects. Belulang grass *(Eleusine indica)* is a type of plant that has been studied to have antidiabetic activity. This plant was known to contain secondary metabolite compounds which have antidiabetic potential. This research aimed to determine the antioxidant and antidiabetic activity of ethanol extract and n-hexane extract of belling grass in vitro using DPPH and *α-glucosidase inhibitor* methods.
Methods: This study extracted Beluluang grass (Eleusine indica) using maceration extraction with 96% ethanol and n-hexane solvent. The extract obtained was tested for antioxidant with the DPPH and antidiabetic activity *α-glucosidase inhibitor method* using UV-Vis spectrophotometry and spectrophotometry-ELISA at a wavelength of 405 nm.
Results: The results of the research showed that the antioxidant activity of Belulang grass (*Eleusine indica* (L.) Gaertn) ethanol and n-hexan extracts (IC_{50} value) were 219.91 ppm and 2853.34 ppm (fragile category). The results of the antidiabetic activity test of ethanol and the n-hexane extract showed potent inhibitory activity, with an IC_{50} value of 6.27318 µg /mL and 6.14799 µg /mL.
Conclusions: The results suggested that natural extract belling has noteworthy effectiveness as a potential candidate for complementary medicine as an antidiabetic agent, warranting further investigation in a pre-clinical setting.

PV060 / #565

THE ROLE OF INCREASED CIRCULATING AMINO ACIDS IN THE PATHOGENESIS OF TYPE 2 DIABETES MELLITUS: A LITERATURE REVIEW

DIABETES AND/OR OTHER ENDOCRINE DISEASES & NUTRITION

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Background and Aims: Metabolomic investigations consistently reveal increased circulation concentrations of alanine, tyrosine, glutamate, phenylalanine, methionine, and lysine in persons with Type 2 Diabetes Mellitus (T2DM).
Methods: This literature review consolidates current information about the molecular role of elevated amino acids in the pathophysiology of Type 2 Diabetes Mellitus (T2DM).
Results: Alanine and glutamate augment hepatic gluconeogenesis via ALT2 upregulation and ATF4-mediated stress signaling, resulting in elevated fasting glucose levels. Tyrosine and phenylalanine impair insulin signaling through mTORC1–S6K1 activation, oxidative stress-mediated incorporation of atypical tyrosine isoforms into IRS-1, and phenylalanine-induced deactivation of the insulin receptor β. Glutamate exacerbates excitotoxicity, oxidative stress, and mitochondrial dysfunction, leading to insulin resistance and β-cell susceptibility. The increase of methionine indicates disrupted transmethylation pathways, exacerbating oxidative and metabolic stress, whereas lysine dysregulation modifies energy metabolism and promotes fat accumulation linked to mitochondrial failure.
Conclusions: These data collectively suggest that increased amino acids are not only metabolic by-products but rather active contributors to insulin resistance, excessive hepatic glucose production, mitochondrial stress, and persistent low-grade inflammation in type 2 diabetes mellitus (T2DM). Comprehending these pathways underscores amino acid dysmetabolism as a pivotal element of diabetic pathogenesis.

PV061 / #651

IMPACT OF TREATMENT ON GLUCOSE HOMEOSTASIS IN CHILDREN DIAGNOSED WITH ACUTE LYMPHOBLASTIC LEUKEMIA – EXPERIENCE OF A SINGLE PEDIATRIC ONCOLOGY CENTER

DIABETES AND/OR OTHER ENDOCRINE DISEASES & NUTRITION

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Background and Aims: In children diagnosed with acute lymphoblastic leukemia (ALL), treatment which includes corticosteroids and chemotherapy can lead to iatrogenic diabetes mellitus (IDM) by damaging pancreatic function both in direct and indirect manner. We aimed to analyze the incidence of glucose homeostasis alterations in pediatric patients with ALL. Secondary objectives included assessment of the therapeutical interventions necessary for maintaining a normoglycemic status, as well as the impact of these complications on survival of patients.
Methods: The retrospective study analyzed 117 patients diagnosed with ALL during a 10-year period. All pediatric patients (age 0-18 years) with at least one altered blood glucose result where included. Medical records and data available in the electronical hospital database were recorded for descriptive statistics. For survival evaluation and comparison between groups a statistical software was used.
Results: IDM was present in 3.41% of the patients (n=4), transient hyperglycemia (TH) in 15.38% of the cases (n=18) while 81.21% of the patients (n=95) had a normoglycemic status during treatment. All the hyperglycemic events occurred during treatment with either corticosteroids and/or Asparaginase. All the patients with IDM required insulin therapy for achieving a normoglycemic status. Three of the 4 patients with IDM (75%) responded to insulin treatment, while in one case the IDM was further complicated by metabolic syndrome.
Conclusions: IDM is a rare complication of pediatric ALL treatment. The outcome with correct management is favorable in most of cases. Frequent reassessment of glucose homeostasis is necessary in children with ALL treated with corticosteroids and/or chemotherapy to early diagnose and treat complications.

PV062 / #278

VEGETABLE CONSUMPTION AND DYSLIPIDAEMIA AMONG AFRICANS FROM FIVE COUNTRIES IN SUB-SAHARAN AFRICA.

DIABETES AND/OR OTHER ENDOCRINE DISEASES & NUTRITION

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Background and Aims: Dyslipidaemia threatens the health of diverse populations, but little is known about the significance of vegetable consumption in its onset. This study assessed the association between vegetable consumption and dyslipidemia among Africans.
Methods: Overall, 13,172 participants (6,586 case-control pairs of dyslipidaemia matched for age within ±5 years, sex, and country) were identified from the pooled dataset of SIREN and AWI-Gen studies in the CHAIR Project of the H3 Africa consortium. The frequency of vegetable consumption (servings/week) and lipid profiles (in mg/dl: high-density lipoproteins–HDL, low-density lipoproteins–LDL, total cholesterol–TC, and triglycerides–TG) were assessed using standardized methods. The odds ratios (ORs) and 95% confidence intervals (CIs) for dyslipidemia by quartiles of vegetable consumption were assessed using conditional logistic regression at a two-sided $P<0.05$, adjusting for relevant covariates.
Results: The median (IQR) vegetable consumption was 7.0 (2.0, 14.0) servings per week. The multivariable-adjusted OR (95%CI) of lipid profiles by quartiles of vegetable consumption were low HDL<40mg/dl {1.00, 0.90 (0.78, 1.04), 0.93 (0.81, 1.06) and 0.80 (0.68, 0.94), *P* for trend=0.01}, high

LDL≥130mg/dl {1.00, 0.89 (0.75, 1.07), 0.85 (0.72, 1.00), and 0.94 (0.78, 1.14), *P* for trend=0.94}, high TC≥200mg/dl {1.00, 0.94 (0.77, 1.15), 0.79 (0.65, 0.95) and 0.87 (0.71, 1.06), *P* for trend=0.28}, and high TG≥150mg/dl {1.00, 0.76 (0.57, 1.02), 0.94 (0.71, 1.24) and 0.91 (0.67, 1.23), *P* for trend=0.96}, for first, second, third and fourth tertile respectively.

Conclusions: Promoting higher vegetable consumption may be a promising approach for the primary prevention of dyslipidemia among Africans.

PV063 / #631

FREQUENT USAGE OF MOBILE PHONE AND COMPUTER AMONG TERTIARY INSTITUTION STUDENTS ARE ASSOCIATED WITH SEDENTARINESS HEALTH CONSEQUENCES

DIABETES AND/OR OTHER ENDOCRINE DISEASES & NUTRITION

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Background and Aims: Sedentary behaviour (SB) is a lifestyle characterized by low-energy expenditure during wake-periods and is an independent predictor of cardiometabolic risks. Cumulative evidence suggests the role of extended daily sedentariness (4–8 hours) in non-communicable disease (NCD) development, which accounts for 71% of global mortality. This increases the risk of declining cardiometabolic health such as type 2 diabetes, cardiovascular disease, obesity. This study assessed frequent mobile phone and computer usage associated with cardiometabolic markers among the study participants.
Methods: A cross-sectional study was conducted on 100 students of Adeleke University, Osun State, using multistage sampling technique. Data were collected using a semi-structured, self-administered Students Sedentary Behavior Questionnaire (SSBAQ). Serum and urine samples of the participants were taken to conduct quantitative biochemical analysis. The data were set significance at 5%.
Results: The age range of respondents was 15 and 23 years. Majority of the respondents engaged in high SB (sitting > 4 hours per day). Respondents significantly ($p < 0.0001$) spent more hours in using mobile phone (5.63 ± 1.37 (58.6%)) and computers (5.79 ± 1.42 (39.6%)). Renal function and cardiometabolic risk markers such as urine creatinine ($p= 0.047$) and albumin-to-creatinine ratio ($p= 0.333$), lifestyle factors such as playing games ($p= 0.028$), and anthropometric values such as body mass index ($p= 0.015$) were factors significantly associated with SB.
Conclusions: Mobile phone and computers are the frequent SBs among tertiary institution students and these behaviours were associated with cardiometabolic risk markers. Hence, prolonged sitting time could be a public health concern that needs to be addressed.

PV064 / #677

"ONE-IN-A-MILLION GCK MUTATION - CLINICAL PRESENTATION AND MANAGEMENT IN A 6.5-YEAR-OLD PATIENT"

DIABETES AND/OR OTHER ENDOCRINE DISEASES & NUTRITION

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Background and Aims: Mutations in the glucokinase (GCK) gene account for 1–2% of diabetes cases and cause maturity-onset diabetes of the young (MODY), characterized by mild hyperglycemia. Whereas pharmacological treatment is usually ineffective, management requires an appropriate diet. This report describes an extremely rare GCK-MODY variant to raise clinical awareness and highlight diagnostic challenges.
Methods: A comprehensive clinical and genetic evaluation was performed on a 6.5-year-old boy. He developed normally until 1 year and 7 months. During the first hospitalization, caused by polydipsia, polyuria and nycturia, he underwent diabetic testing. Follow-up over next 5 years remained limited. At age 6, rising glucose levels and weight loss prompted rehospitalization. Given the strong family history - patient's father with MODY2 and amputated extremities, the gene sequencing was initiated.
Results: In 2020, laboratory results revealed elevated fasting glucose (120 mg%), HbA1c% (6,6 %) and impaired glucose tolerance in oral glucose tolerance test (150 mg/dl). Negative pancreatic autoantibodies and normal C-peptide excluded type 1 diabetes mellitus. In 2025, tests showed similar abnormalities, and high HbA1c% (6,5%) led to the diagnosis of diabetes. Then, genetic assessment revealed a pathogenic GCK mutation with a global frequency of 1:1,611,132. Currently, the patient remains under diabetic control, without any medication. Dietary habits and physical activity are highly recommended.
Conclusions: Long-term management of metabolic disorders such as GCK-MODY relies heavily on healthy lifestyle practices. As the condition is often mild and asymptomatic, insufficient awareness may delay adequate monitoring. Early diagnosis enables appropriate follow-up and nutritional guidance, preventing disease progression and improving quality of life.

PV065 / #364

THE INFLUENCE OF FOOD NEOPHOBIA ON CHILDREN'S VEGETABLE CONSUMPTION AND WILLINGNESS TO TRY: RESULTS OF THE VEGGIES4MYHEART PROJECT

DIABETES AND/OR OTHER ENDOCRINE DISEASES & NUTRITION

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Background and Aims: Food neophobia (FN) – avoidance of novel foods - can limit children's vegetable intake and dietary variety. Understanding the determinants of vegetable acceptance is key to developing effective interventions. The Veggies4myHeart project examined associations between children's FN, willingness to try (WTT), and vegetable consumption.
Methods: This cross-sectional study included children aged 2–5 years from a preschool in Leiria, Portugal. FN was assessed using the Child Food Neophobia Scale (CFNS), WTT with the Farfan-Ramirez scale (FR-WTT), and vegetable intake by the number of portions consumed. Children were classified as neophilic, neutral, or neophobic. Group differences were analysed using Kruskal-Wallis test and post hoc tests ($p < 0.05$) in IBM SPSS.
Results: Seventy children participated (mean age = 3.96±0.91 years; 42% female). Based on CNFS, 17.2% were neophobic, 68.8% neutral, and 14.1% neophilic. Neophobic children showed higher WTT scores than neophilic peers for lettuce (p=0.044), onion (p=0.016), and cucumber (p=0.038), and higher than both groups for beetroot (p=0.005), tomato (p=0.010), and total FR-WTT (p=0.001). Neophobic children consumed more portions of lettuce (p=0.029) and beetroot (p=0.033) than neophilic children. They also consumed more onion (p = 0.015), cucumber (p = 0.008), tomato (p = 0.046), and total vegetable portions (p = 0.010) than both neutral and neophilic children.
Conclusions: Contrary to expectations, neophobic children showed higher WTT and vegetable intake. Parental perception of FN may not reflect children's actual food choices. The group effect in the school setting may also explain this outcome. Further research should investigate how parental perception shapes children's food acceptance.

PV066 / #763

TAURINE ENHANCES ADIPOCYTE GLUCOSE UPTAKE AND LINKS TO GRANULOCYTE-CENTERED IMMUNE PROGRAMS IN DIABETES AND NHANES

DIABETES AND/OR OTHER ENDOCRINE DISEASES & NUTRITION

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Background and Aims: Taurine is widely consumed as a dietary supplement and has been implicated in diabetes-relevant processes, yet the mechanisms remain incompletely understood. We aim to study the effect of taurine on cardiovascular health and the underlying pathways.
Methods: We quantified adipose taurine by mass spectrometry in young versus aged mice (12 weeks vs 80–81 weeks) and assessed glucose uptake in 3T3-L1 adipocytes treated with taurine (10 mM) with or without insulin (1 μM). To investigate taurine-associated transcriptional changes in diabetes, functional enrichment and immune infiltration analyses were performed using taurine-associated differentially expressed genes (DEGs) in the transcriptomes of diabetes samples (GSE95849, GSE40234). Finally, we examined survey-weighted and covariate-adjusted NHANES 1999-2018 associations across 25 glycemic, metabolic, and inflammatory outcomes among participants using taurine-only supplements without any other supplements, both in the overall and no-diabetes group.
Results: Adipose taurine decreased with aging (−2.883 μmol/g). Taurine co-treatment increased glucose uptake versus insulin alone (2.530-fold). Taurine-associated DEGs delineated an inflammation–stress module enriched for IL-17/TNF, and immune infiltration profiling highlighted increased neutrophil (P=0.028) and eosinophil (P=0.045) scores in diabetes, and cross-cohort analyses prioritized PINK1 and MMP9 as the most reproducible granulocyte-linked hub candidates. In NHANES, taurine-only users had lower 2-hour oral glucose tolerance test (2-h OGTT) glucose levels, neutrophil and eosinophil counts in both the overall and no-diabetes groups (FDR-adjusted $P < 0.05$).
Conclusions: Across tissue biochemistry, adipocyte function, taurine-associated immune transcriptomics, and population biomarkers, evidence supports a taurine-linked granulocyte–stress axis associated with lower 2-h OGTT, prioritizing inflammatory remodeling pathways (including PINK1/MMP9-linked networks) for mechanistic testing and prospective validation.

PV067 / #687

DIETARY HABITS, NUTRITIONAL KNOWLEDGE AND INFORMATION SOURCES IN ADOLESCENT GIRLS PRACTICING ARTISTIC GYMNASTICS

EATING DISORDERS & MENTAL HEALTH

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Background and Aims: Adolescence is a critical period for establishing healthy eating habits, especially in highly demanding sports as artistic gymnastics. Inadequate nutrition may improve both health and performance. This study aims to evaluate dietary habits, nutritional knowledge and main information sources in adolescent gymnasts.
Methods: Sixty-five female gymnasts aged 11–16 years have been evaluated, using two validated questionnaires: the Mediterranean Diet Quality Index (KIDMED) and the Adolescent General and Sport Nutrition Knowledge Questionnaire (ANSKQ). An exploratory section investigated nutrition information sources and the perceived reliability of online content.
Results: Overall adherence to the Mediterranean diet was intermediate (KIDMED 5.73 ± 2.12). Most participants (69.2%) had medium adherence, 15.4% high and 15.4% low. Fruits, vegetables and dairy products were most frequently consumed, whereas legumes, whole grains and a second daily fruit portion were less common. ANSKQ showed moderate-to-low nutritional knowledge, with higher scores in general nutrition than in sport-specific items. No significant correlation emerged between knowledge and dietary adherence. Family (76.9%) and school (66.2%) were the main nutrition information sources; fewer relied on health professionals (20.0%) or social media (18.5%), though 26.2% changed eating habits after online content exposure.
Conclusions: Adolescent gymnasts showed partial adherence to the Mediterranean diet and limited sport-specific nutritional knowledge. The lack of association between knowledge and diet suggests that only knowledge is insufficient to ensure adequate nutritional behavior. Integrated, evidence-based educational interventions involving families, schools and sports environments are strongly recommended to support health and long-term athletic performance.

PV068 / #371

NUTRITION KNOWLEDGE, EATING HABITS, AND RED-S RISK IN ADOLESCENT WINTER-SPORT ATHLETES: IMPLICATIONS FOR PEDIATRIC ATHLETE HEALTH

EATING DISORDERS & MENTAL HEALTH

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Background and Aims: Adolescent winter-sport athletes are at increased risk of RED-S due to increased energy expenditure and sport-specific pressures. This study aimed to assess nutrition knowledge, dietary habits, and eating-disorder risk among students of the School of Sports Excellence in Szczyrk, Poland, and to identify early indicators of RED-S where pediatric screening remains limited.
Methods: An anonymous cross-sectional survey was conducted using a questionnaire integrating the validated KomPAN tool and the EAT-26. Ethical approval was obtained (118.0043.1.408.2024). Data were analyzed in SPSS v.29. Normality was assessed with the Shapiro–Wilk test, and associations between categorical variables with Chi-square tests ($p < 0.05$).
Results: Sixty-three students participated [median age 17 (IQR 15–17)], the majority were male (74.6%), training winter sport. 88.9% had normal BMI, though its distribution differed significantly ($p = 0.012$), with ski jumpers being the only group consistently below reference values. Nutrition knowledge assessed across three categories was mainly (60.3%) sufficient and correlated positively with higher school grade ($p = 0.005$) and training frequency ($p = 0.038$). Social media and coaches were the primary sources of nutrition information. Students living away from home more often reported regular meals ($p = 0.017$), older athletes snacked less ($p = 0.032$). EAT-26 indicated possible eating-disorder risk in 47.6% of participants, without significant associations with selected variables.
Conclusions: Older athletes and higher-level competitors demonstrated superior nutrition knowledge. The high prevalence of eating-disorder risk highlights the need for systematic monitoring and early prevention. Limited pediatric RED-S understanding and the absence of validated screening tools underscore the need for further research.

PV069 / #170

VITAMIN D, ZINC, AND MENTAL HEALTH: CLINICAL IMPLICATIONS OF COMMON MICRONUTRIENT DEFICIENCIES

EATING DISORDERS & MENTAL HEALTH

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Background and Aims: Vitamin D and Zinc deficiencies are closely linked to mental development and cognitive function in children. The aim of this study was to evaluate the correlation between Vitamin D and Zinc levels with mental health parameters among children.
Methods: The study focused on Georgian children's mental health. A total of 226 healthy children aged 3 to 10 years (mean age: 7.4 ± 2.2 years) participated in the study. The number of patients was almost equally distributed between 109 males (48.2%) and 117 females (51.8%). Demographic, genetic, anthropometric, clinical, instrumental, and biochemical data were collected, including the type and frequency of nutrition. IQ was determined according to Raven's Progressive Matrics Test.
Results: A diagnostic cut-off value for vitamin D (24.8 ng/mL) with very low sensitivity (54%) and very high specificity (91.7%) was determined for predicting low IQ. A cut-off value for zinc (79.4 µg/dL) with low sensitivity (62.4%) and high specificity (79.4%) was determined.
Conclusions: These findings emphasize the synergistic role of Vitamin D and Zinc in supporting cognitive and emotional well-being. Maintaining adequate levels of both nutrients therefore essential for ensuring optimal child mental health. The results highlight the urgent need for early detection of deficiencies and the implementation of targeted nutritional interventions as part of routine pediatric care.

PV070 / #616

DEVELOPMENT AND PSYCHOMETRIC EVALUATION OF THE DISORDERED EATING ASSESSMENT SCALE (DEAS)

EATING DISORDERS & MENTAL HEALTH

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Background and Aims: This study aims to develop the Disordered Eating Assessment Scale (DEAS) and to examine its validity and reliability to provide a dependable tool for evaluating eating behaviors.
Methods: The methodological study was conducted with 401 university students (mean age: 23.71 ± 7.32) during the 2021–2022 academic year. An eight-stage scale development procedure was followed. After pilot testing and item analysis, the scale was finalized with 25 items and three factors. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were used to assess the factor structure, while internal consistency was evaluated using Cronbach's Alpha. Validity was further examined through correlations with the Three-Factor Eating Questionnaire (TFEQ-R21) and Body Mass Index (BMI).
Results: EFA and CFA results demonstrated a three-factor structure consisting of cognitive restrictive eating, hedonic eating, and emotional eating. Cronbach's Alpha coefficients indicated high internal consistency, with values of 0.944 for the overall scale and 0.926, 0.931, and 0.917 for the respective subscales. Correlation analyses with the TFEQ-R21 supported the theoretical consistency and construct validity of the DEAS ($p < 0.001$). Additionally, significant positive correlations were identified between BMI and the scale's factors.
Conclusions: The DEAS is a valid and reliable instrument offering a comprehensive assessment of eating behaviors. It effectively distinguishes cognitive restrictive, hedonic, and emotional eating tendencies, making it suitable for screening and early identification of disordered eating patterns. Further validation in different age groups, cultural contexts, and clinical populations is recommended to strengthen the scale's generalizability.

PV071 / #654

FROM PLATE TO PSYCHE: HOW DIET AND CHRONOTYPE SHAPE MENTAL HEALTH

EATING DISORDERS & MENTAL HEALTH

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Background and Aims: Depression, anxiety, and stress remain major public health concerns worldwide. Growing evidence suggests that lifestyle factors particularly dietary habits and circadian rhythm-related traits play an important role in mental well-being. This study aimed to examine the associations between adherence to the Mediterranean diet and chronotype with levels of depression, anxiety, and stress.
Methods: A cross-sectional study was conducted with 749 adults. Data were collected using validated self-report questionnaires, including the Mediterranean Diet Adherence Screener (MEDAS), the Morningness-Eveningness Questionnaire (MEQ), and the Depression Anxiety Stress Scale (DASS-21). Statistical analyses included Spearman correlation, Kruskal-Wallis, chi-square, and Mann Whitney U tests.
Results: Higher adherence to the Mediterranean diet showed a weak yet significant negative association with depression ($\rho = -0.082$, $p < .05$) and anxiety ($\rho = -0.095$, $p < .01$). Morningness chronotype was significantly negatively associated with depression ($\rho = -0.180$, $p < .01$), anxiety ($\rho = -0.116$, $p < .01$), and stress ($\rho = -0.184$, $p < .01$). Although no significant differences in psychological symptoms were found across diet adherence categories, evening-type individuals exhibited substantially higher depression and stress scores than morning and intermediate chronotypes.
Conclusions: The findings indicate that both Mediterranean diet adherence and chronotype have modest yet meaningful associations with mental health outcomes. In particular, the higher symptom levels observed among evening-type individuals highlight the role of circadian rhythm variations in psychological well-being. Integrating dietary and circadian-based approaches into preventive mental health strategies may therefore offer valuable benefits.

PV072 / #496

THE INVISIBLE LINK: HOW NEUROLOGICAL DISORDERS AFFECT THE DIGESTIVE SYSTEM IN CHILDREN WITH AUTISM AND CEREBRAL PALSY

EATING DISORDERS & MENTAL HEALTH

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Background and Aims: Background and aim: Neurological disorders are associated with high levels of nutritional and gastrointestinal (GI) problems. This study aimed to investigate the most common GI symptoms in children with Autism Spectrum Disorders (ASD) and Cerebral Palsy (CP) from Bulgaria.
Methods: Methods: Between August 2023 and September 2025, a cross-sectional study was conducted to investigate children with ASD and CP. They were assessed in the context of demographic, nutritional, and gastrointestinal parameters. Statistical analyses were performed using Jamovi 2.6.17 with a significance threshold of $p < 0.05$.
Results: Results: The work evaluated 166 children (ASD: 81.4% male; children with CP: 56.3% male). The mean age of the children with ASD was 6.68 ± 2.41 years, and that of those with CP was 5.33 ± 3.03. The prevalence of hypersalivation was higher (54.2%) in children with CP ($p< 0.001$), while gastroesophageal reflux (GER) was more common in children with ASD (53.3%) ($p=0.039$). Constipation was reported in 20.7% of children with ASD and 48.9% of children with CP ($p<0.001$). Hard stools were more common in children with grade 3 disability (47.2%, $p=0.047$). The water intake was found to be positively correlated with the age of the children ($rs=0.392$, $p<0.001$). There was a higher water intake in children with ASD (109ml) compared to those with CP (576ml) ($p=0.003$).
Conclusions: Conclusion: GI has a significant impact on the health of children with neurological diseases, and interventions to manage them are essential for improving their nutritional and health status.

PV073 / #465

GAS CHROMATOGRAPHY ANALYSIS OF ARTEMISIA ARBORESCENS ESSENTIAL OIL AND IN SILICO EVALUATION OF ITS CONSTITUENTS AS MODULATORS OF INFLAMMATORY PATHWAYS INVOLVED IN INFLAMMATORY BOWEL DISEASES

GUT MICROBIOME & BIOTICS

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Background and Aims: The complex pathogenesis of Inflammatory Bowel Diseases (IBD), characterized by chronic inflammation and gut microbiota dysbiosis, requires multi-target and well-tolerated therapeutic strategies. This has sparked interest in botanicals like *Artemisia arborescens (A. arborescens)*, a Mediterranean plant esteemed in traditional medicine for its properties. This study integrated an *in silico* approach to analyze its essential oil (EO) and uncover its molecular mechanisms.
Methods: The EO was extracted by hydrodistillation and analyzed by Gas Chromatography-Mass Spectrometry (GC-MS) to establish its phytochemical profile. Drug-likeness and pharmacokinetics of key compounds were predicted using ADMETlab3.0 and SwissADME. Potential protein targets were obtained from SwissTargetPrediction, followed by pathway enrichment analysis via MetaboAnalyst AI. Molecular docking simulations were performed against six key inflammatory and oxidative stress targets: NF-κB, COX-2, Keap1, MPO, TNF-α, and NOX-2.
Results: GC-MS identified Camphor (29.91%), β-Thujone (19.45%), and Chamazulene (11.71%) as dominant constituents. ADMET predictions suggested good absorption for monoterpenoids but potential toxicity, whereas Chamazulene and Germacrene D showed moderate hepatotoxicity with favorable systemic activity. Pathway enrichment highlighted modulation of inflammation- and lipid-related processes, including PPAR signaling, arachidonic acid metabolism, and NF-κB signaling. Docking confirmed strong predicted affinities of Chamazulene for NF-κB, NOX-2, and Keap1.Germacrene D complemented these effects, particularly against MPO and COX-2 supporting multi-target anti-inflammatory and antioxidative potential.
Conclusions: *A. arborescens* EO demonstrates promising multi-target anti-inflammatory and antioxidative activity, with Chamazulene and Germacrene D targeting key IBD-relevant proteins. These findings provide a mechanistic basis for further studies to explore its therapeutic potential in gut inflammation.

PV074 / #645

PREBIOTIC AND PROBIOTIC USE IN HEALTHY INFANTS AND TODDLERS: A SURVEY OF PARENTAL KNOWLEDGE, CONSUMPTION PATTERNS AND PERCEIVED BENEFITS

GUT MICROBIOME & BIOTICS

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Background and Aims: Parents often introduce prebiotic and probiotic products into their infants' and toddlers' diets assuming potential health benefits. Misconceptions and limited evidence-based knowledge may contribute to inappropriate use or unrealistic expectations. This survey aimed to investigate parental awareness, understanding and use of prebiotic and probiotic products in children aged 0–3 years.
Methods: We performed a cross-sectional study in Belgium. Recruitment of parents was conducted both face-to-face and online via social media platforms. The survey assessed demographic characteristics, dietary habits, knowledge, use, parental attitudes and perceptions regarding pre- and probiotics.
Results: A total of 588 parents (mean age 33.1 ± 2.0 years) completed the survey, of whom 363 (61.7%) participated through social media. Most respondents were familiar with the term probiotics (90.5%), while 57% reported familiarity with prebiotics. 18.9% of parents administered a daily supplement or formula containing pre- or probiotics to their children. Parents correctly identified the evidence-based effect in 43.1% of cases for prebiotics (improved stool consistency) and in 45.9% of cases for probiotics (reduced antibiotic-associated diarrhea). In 40.8 % of cases, healthcare professionals recommended pre- or probiotic supplements for the treatment of a disease. Pediatricians were the primary prescribers (n=128, 53.8%). 36.4% of parents reported receiving such recommendations for preventive purposes, most commonly from pediatricians (n=80, 44.7%).
Conclusions: Belgian parents participating in our survey were familiar with pre- and probiotics but less than half correctly identified their proven effect. This underscores the need for clearer guidance from healthcare professionals.

PV075 / #685

CAESAREAN SECTION AND INFANT GUT MICROBIOTA IN THE MIDDLE EAST: A MULTIDISCIPLINARY EXPERT CONSENSUS ON LONG-TERM EFFECTS AND MITIGATING STRATEGIES

GUT MICROBIOME & BIOTICS

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Background and Aims: Early-life dysbiosis as result of Caesarean section (C-section) delivery is recognized as a risk factor for a range of health disorders. This multidisciplinary expert consensus summarizes the clinical implications of C-section on infant gut microbiota, proposing evidence-based strategies to mitigate these effects.
Methods: A multidisciplinary panel of pediatricians, neonatologists, gastroenterologists, and nutrition experts from across the Middle East reviewed current evidence and participated in a structured consensus process. Consensus statements were developed and validated through expert voting and commentary, supported by targeted literature review.
Results: The expert panel reached consensus on the impact of C-section delivery on early microbiota composition and associated health risks, emphasizing that rising prevalence of C-sections demands urgent attention. Experts emphasized the importance of exclusive breastfeeding as primary strategy to support healthy microbiota development in C-section born infants. If exclusive breastfeeding is not possible, tailored infant formulas – containing clinically validated prebiotics, probiotics or synbiotics – were recognized as promising alternatives to mitigate dysbiosis. The panel underscored that not all probiotics are equally effective, further advocating for continuing microbiota-targeted support throughout the first 1,000 days, while acknowledging the need for more long-term data. Additionally, the panel emphasized the importance of educating parents and healthcare professionals on the long-term implications of C-section delivery for the broader adoption of eubiosis-targeted strategies.
Conclusions: Optimizing microbial colonization in C-section-born infants requires a multifaceted strategy, prioritizing breastfeeding, guided use of targeted specific nutritional interventions, and education of both healthcare providers and parents, aligning clinical practice with evolving microbiome science.

PV076 / #187

MODULATING INFANT IMMUNITY AND NUTRITION: THE EMERGING ROLE OF PREBIOTICS, PROBIOTICS, POSTBIOTICS , OSTEOPONTIN IN HUMAN MILK AND FORMULA FEEDING

GUT MICROBIOME & BIOTICS

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Background and Aims: Numerous studies have demonstrated that intestinal microbiota under the influence of diet shapes the maturation of the immune system, A new challenge for dairy industries is to develop formulas inducing the maturation of immunity and the microbiota that can be observed in breastfed delivered vaginally, representing reference infants., in this abstract we will focus on pre, pro post biotics and osteopontin role in modulating infant gut immunity
Methods: To establish the current knowledge on biotics" in infant milk, Articles mainly published over the last 12 years, were evaluated based on their title and abstract, checking for the inclusion and exclusion criteria. focused only on primary and secondary outcomes at a nonclinical level regarding the microbiota, digestive metabolites, and intestinal immunity
Results: Clinical beneficial effects of prebiotics (mainly GOSs, FOSs, and HMOs) have been observed, particularly, to effect a modest reduction in infections in infants, Some bacteria (probiotics)can modulate the whole microbiota composition and digestive microenvironment postbiotics is metabolites impacts on the bacterial microbiota are increasingly observed, the mechanisms and the long-term positive or negative consequences on microbiota function, immunity, and the metabolomic profiles of these pre-, pro-, syn-, and postbiotics given early in life when the microbiota and the immune system are still immature Osteopontin (OPN), a multifunctional protein, is present abundantly in human milk, but not in bovine milk and infant formulas. A recent RCT showed that supplementing infant formula with bovine milk OPN (bOPN) resulted in better immune outcomes.
Conclusions: Prebiotics,probiotics ,postbiotics ,osteopontin have emerging role in modulating infant immunity through nutrition

PV077 / #322

SCHOOL AGE NEURODEVELOPMENTAL AND ATOPY-RELATED OUTCOMES OF EXTREMELY PRETERM INFANTS: FOLLOW UP FROM THE SINGLE-STRAIN VERSUS TRIPLE-STRAIN BIFIDOBACTERIUM RANDOMIZED CONTROLLED TRIAL

GUT MICROBIOME & BIOTICS

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Background and Aims: Background and Aims: Probiotic supplementation for very preterm infants is widely practiced. Understanding whether early postnatal exposure influences long-term neurodevelopment, growth, and atopy is essential. Infants born extremely preterm (EP<28 weeks) enrolled in the SiMPro randomized trial, comparing single-strain (SS) versus triple-strain (TS) *Bifidobacteria,* provided a unique cohort for long-term evaluation.
Methods: Methods: Infants were randomized to receive SS: *B. breve* M-16V or TS: *B. breve* M-16V, *B. longum* subsp. *infantis* M63, *B. longum* subsp. *longum* BB536 probiotics after birth. Follow-up assessments at five years included cognition (WPPSI-IV Full Scale IQ), behaviour (Strengths and Difficulties Questionnaire), executive function (BRIEF-P), anthropometry, and blood pressure (BP). Atopy outcomes at 6–7 years were collected using the ISAAC questionnaire. Linear mixed models evaluated longitudinal measures; impairment indicators were modelled with logistic regression adjusted for SEIFA centiles. Faecal metagenomics quantified microbial short-chain fatty acid pathways relevant to neurodevelopment.
Results: Results: Follow-up rates were high (SS: 89.2%; TS: 93.7%). Neurodevelopmental outcomes were similar, including severe impairment (FSIQ < 70: SS 7.4% vs TS 4.3%, p = 0.68). Growth, BMI, and BP were comparable. Behavioural profiles showed a non-significant trend toward higher total difficulty scores in TS, while SS demonstrated marginally higher prosocial scores. TS showed non-significant increase in executive function indices. Disability rates (none: SS 66.7% vs TS 55.4%) and atopy outcomes were comparable.
Conclusions: Conclusions: Early supplementation of EP infants with either single- or triple-strain *Bifidobacteria* appears safe, with no significant differences in neurodevelopmental, growth, or atopy-related outcomes at school age. Further studies linking metabolomics and neuroimaging are warranted.

PV078 / #729

APTAMIL ADVANCE CESAR USE IN THE MIDDLE-EAST: A SURVEY-BASED PROSPECTIVE STUDY

GUT MICROBIOME & BIOTICS

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Background and Aims: Babies delivered by C-section exhibit an imbalanced intestinal flora with reduced diversity. This study reports for the first time on the experience of infants born by C-section and their parents in the Middle East with Aptamil Advance Cesar (AAC), a formula containing scGOS/lcFOS, 2'FL and B.Breve M-16V tailored for C-section–born infants.
Methods: Following IRB approval and the provision of informed consents, this observational, longitudinal survey-based study, included 389 infants under 1 year across 80 centers in the UAE, Oman, Kuwait, Qatar, and KSA. Data was collected at baseline, week 1, and week 5, after AAC introduction, via two pediatrician-assisted questionnaires on formula acceptance, tolerability, digestion, sleep, behavior, and parental perception. Responses were captured in Google Forms, exported to Excel, and analyzed using the Statistical Analysis Software SAS (version 9.4).
Results: Five weeks after starting AAC, 362 parents (93.1 %) reported that their infants had soft stools, and 357 parents (91.8%) that their infants did not experience any health issues such as burping, colic, or flatulence. Nearly all parents strongly agreed or agreed that their infants liked the taste of AAC (99.7%), drank it easily (99.2%), were filled up (98.7%), and digested it well (98.7%). High satisfaction was also reported for sleep patterns (98.5%), stool frequency and consistency (over 95%), and infant's performance and behavior (over 75%), 5 weeks after introducing AAC. Notably, 98% of caregivers indicated they would recommend AAC to others.
Conclusions: These findings suggest high parental satisfaction and good tolerance of AAC in this cohort.

PV079 / #546

MICROBIOME–IMMUNE SYSTEM INTERACTIONS IN RHEUMATOID ARTHRITIS: FROM DYSBIOSIS TO AUTOIMMUNITY

GUT MICROBIOME & BIOTICS

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Background and Aims: Many studies clearly indicate that the gut microbiota plays an important role in the pathogenesis of RA. The main mechanisms are: the production of proinflammatory metabolites, disruption of the intestinal mucosal barrier function, and molecular mimicry of autoantigens. This study included 77 female patients older than 18 years, who met the American College of Rheumatology 2010 classification criteria for rheumatoid arthritis (RA), and 113 healthy controls.
Methods: The study group consisted of women with a confirmed RA diagnosis according to the 2010 classification criteria of the American College of Rheumatology (ACR) and a first duration of ≥1 year. Active disease activity was assessed using the DAS28 scale. The control group consisted of family members matched to RA patients by age (over 18 years), ethnicity, and other criteria. They had no family history of RA or other autoimmune diseases. All members of the control group underwent laboratory tests.
Results: The results showed significant differences in both alpha- and beta-diversity between the control group and RA patients. The difference between the groups, as measured by the Shannon index, was not statistically significant ($p = 0.4$), while the α-diversity of microbial taxa, as measured by the Chao1 index ($p = 0.019$) and Faith's PD ($p = 0.006$), was relatively lower in RA patients compared to healthy controls. These differences were considered statistically significant.
Conclusions: Our study revealed differences in the gut microbiome between RA patients and healthy controls. Notably, a distinct microbial pattern characterized by high expression of specific taxa was detected in both groups.

PV080 / #7

IN SILICO CHARACTERIZATION OF BIOACTIVE COMPOUNDS FROM FERMENTED VEGETABLES AS POTENTIAL MODULATORS OF INTESTINAL INFLAMMATION

GUT MICROBIOME & BIOTICS

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Background and Aims: The gut microbiota represents a complex ecosystem that maintains host homeostasis. Its disruption can lead to dysbiosis, contributing to the development of inflammatory bowel diseases (IBD) such as Crohn's disease and ulcerative colitis. Current therapies are often limited by modest efficacy and side effects, highlighting the need for safer and more effective alternatives. Fermented foods are rich in prebiotics, probiotics, and postbiotics, which can beneficially modulate intestinal health. This study aims to evaluate, through in silico approaches, the anti-inflammatory potential of 35 bioactive compounds derived from fermented vegetables, with the goal of identifying promising postbiotic candidates that can modulate intestinal inflammatory pathways and contribute to the development of novel therapeutic strategies for IBD
Methods: A multi-step bioinformatics pipeline was employed, including ADMET property evaluation, functional enrichment analysis, and molecular docking to investigate 35 compounds from fermented vegetables and to predict their interactions with inflammation-related targets
Results: The analyses identified several compounds with favorable pharmacokinetic and safety profiles, witch certain candidates excelling in absorption, others in distribution, metabolism or toxicity reflecting complementary pharmacokinetic strenghts. Furthermore, molecular docking results highlighted strong binding affinities of specific molecules, notably folic acid, which strongly interacted with all protein targets, and menaquinone, which exhibited particularly high affinity toward AKT, suggesting their ability to modulate key signaling pathways implicated in intestinal inflammation
Conclusions: All results provide computational evidence that postbiotic compounds from fermented vegetables may represent novel therapeutic candidates for the prevention and management of intestinal inflammation. Nonetheless, experimental validation and clinical trials remain necessary to confirm their efficacy and safety.

PV081 / #208

EFFECT OF EARLY PREGNANCY METABOLIC CHANGES ON OFFSPRING GROWTH

INFANCY INCLUDING DISEASE PREVENTION

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Background and Aims: The worldwide prevalence of overweight/obesity in childbearing women is increasing. Maternal pre-pregnancy BMI is a known risk factor for increased birth weight and childhood obesity in the offspring, however, the factors contributing to this relationship are unclear. This study explored the relationship between maternal metabolism and fetal and infant growth and adiposity in an at-risk population.
Methods: We included 30 overweight/obese pregnant women in the Pregnancy Outcomes and Maternal Insulin Sensitivity (PROMIS) study. Maternal metabolic and anthropometric parameters were assessed in the early second trimester. Fetal growth was monitored throughout pregnancy. Birth weight, infant growth and adiposity outcomes were collected from 1-6 months.
Results: Median maternal BMI was 29.40 (IQR 26.50-33.75). Fasting insulin, HOMA-IR and maternal body fat were associated with estimated fetal weight (EFW) at week 20 ($r=0.645$, $r=0.629$, $p<0.01$ and $r=0.526$, $p=0.021$). HDL was negatively correlated with EFW at 24-28 weeks and with fat-free mass at month 3 ($r=-0.535$ and -0.560, $p=0.05$). Maternal pre-pregnancy BMI was negatively correlated with infant weight-for-length at 3-month of age ($r=-0.578$, $p=0.030$). Maternal weight gain before the third trimester correlated with infant birth weight, fat-free mass at 1 and 3 months, and weight-for-age at 1 month ($r=0.564$, 0.683, 0.666, and 0.619, $p<0.05$).
Conclusions: Early gestational weight gain correlated with birth weight and infant growth. Insulin resistance and body fat influenced early fetal growth, but did not affect late fetal or infant growth or adiposity. Larger longitudinal studies are necessary to confirm and explore long-term childhood metabolic consequences.

PV082 / #301

ANALYSIS OF FACTORS INFLUENCING INFANTILE CRYING

INFANCY INCLUDING DISEASE PREVENTION

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Background and Aims: The Cow´s Milk-related Symptom Score (CoMiSS) is an awareness tool intended for infants presenting with symptoms associated with cow´s milk allergy. One of the five subscores reflects the duration of infantile crying throughout the day, ranging from 0 points (crying for less than 1 hour per day) to 6 points (crying for more than 5 hours per day).
Methods: A prospective longitudinal observational single-centre study using CoMiSS was performed in term infants who were repeatedly assessed during scheduled, standard clinical check-ups, and thus presumed healthy. We collected data on age and the feeding type at each evaluation. The linear model with mixed effects was applied to analyse the impact of different variables on crying subscore values. Variables considered as fixed effects were feeding type, gender, and month of predefined assessment.
Results: We collected complete data from 122 infants. Results are summarised in **Table:**

	Fixed effect			Random effect
	Ceficient	95% CI	p-value	SD
Intercept	0.71	0.42; 1.01	<0.001	0.4
Gender: girl	Reference	-	-	-
Gender: boy	0.05	-0.12; 0.22	0.55	
Feeding: bottle-fed	Reference	-	-	-
Feeding: breastfed	0.28	0.00; 0.55	0.054	-
Feeding : breast + solids	0.03	-0.28; 0.33	0.852	-
Feding: breast + bottle	0.35	0.04; 0.66	0.026	-
Feeding: bottle + solids	-0.03	-0.33; 0.27	0.842	-
Month of age	-0.06	-0.09; -0.03	<0.001	-

Conclusions: Factors influencing the daily duration of crying in presumed healthy infants include age ($p < 0.001$) and combined feeding (breast and bottle) ($p = 0.026$).

PV083 / #472

PER- AND POLYFLUOROALKYL SUBSTANCES IN HUMAN BREAST MILK AND ESTIMATED INFANT INTAKE IN NEPAL

INFANCY INCLUDING DISEASE PREVENTION

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Background and Aims: Observational studies have reported associations between early-life exposure to certain per- and polyfluoroalkyl substances (PFAS) and adverse health outcomes. This study aimed to describe the concentrations of 23 different PFAS in human breast milk in Nepal, as well as estimate infant intake through breast milk.
Methods: The study included the peri-urban and surrounding communities of the Bhaktapur Municipality, Nepal. Human breast milk samples were collected from a sub-sample of mothers who participated in a randomized controlled trial measuring the effects of daily vitamin B12 supplementation on child growth and neurodevelopment. The samples were collected when the children were aged between 0–25 months. The concentration of 23 PFAS was quantified using liquid chromatography–mass spectrometry (LC-MS).
Results: Breast milk from 75 women was analyzed, and a total of 12 different PFAS were detected. The highest detection rate of 87% was for perfluorooctane sulfonate (PFOS). Perfluorononanoic acid (PFNA) was detected in 72%, and perfluorooctanoic acid (PFOA) was detected in 63% of the samples. Perfluorohexane sulfonic acid (PFHxS) was not detected in any of the samples. Infant exposure was assessed against the European Food Safety Authority's (EFSA) safety threshold, which is based on the sum of the four indicator PFAS (ΣPFAS-4: PFOS, PFOA, PFNA, and PFHxS). The assessment showed that 18.9% had a weekly exposure above the EFSA safety threshold.
Conclusions: Although only 12 of the 23 investigated PFAS were detected in human breast milk samples from Nepal, 1 in every 5 infants is exposed to levels exceeding EFSA's safety threshold.

PV084 / #566

MODULATION OF POST-VACCINATION REACTOGENICITY IN EARLY INFANCY BY AN IMMUNOPROTECTIVE FORMULA: RESULTS FROM THE EARLYPROTECT TRIAL

INFANCY INCLUDING DISEASE PREVENTION

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Background and Aims: This study evaluated whether an immunoprotective infant formula modulates post-vaccination reactogenicity during early infancy.
Methods: A total of 108 healthy term infants (<5 weeks of age) enrolled in the EarlyPROTECT Study were randomized to receive either a standard infant formula (SF; n=54) or an experimental formula (EF; n=54) enriched with osteopontin, milk fat globule membrane (MFGM), inulin, human milk oligosaccharides (3´-SL, 6´-SL, LNT, 2´-FL, 3-FL), and 6 probiotics. A reference group of breastfed infants (BF; n=11) was also included. Parents recorded post-vaccination symptoms for 6 days following routine immunizations at 2 and 4 months using a digital daily questionnaire. Symptoms included fever, unexplained crying/irritability, reduced appetite, flatulence, sleep disruption, altered stooling patterns, and local injection-site inflammation.
Results: Across the combined post-vaccination periods at 2 and 4 months, infants in the EF group exhibited a significantly lower percentage of symptomatic days for crying (p=0.013), reduced appetite (p=0.034), and flatulence (p=0.018) compared to SF. In the early post-vaccination window (first 3 days), EF-fed infants also showed fewer days with fever (p=0.010), crying (p=0.026), and reduced appetite (p=0.035). Moreover, the proportion of days with marked local inflammation (diameter >20 mm) was reduced in the EF group both across the full 6-day period (p=0.012) and within the first 3 days (p=0.022).
Conclusions: These findings indicate that an infant formula enriched with immunoprotective bioactive compounds may reduce vaccine-related reactogenicity during the first months of

life. **Funding:** PROTECCIÓN (CIEN Project - IDI-20220775) and Laboratorios Odersa S.L., Spanish Ministry of Science, Innovation & Universities.

PV085 / #549

PARENTAL FEEDING PRACTICES, NUTRITIONAL BEHAVIORS, AND GROWTH OUTCOMES IN INFANTS AGED 6–36 MONTHS

INFANCY INCLUDING DISEASE PREVENTION

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Background and Aims: This study aimed to evaluate complementary feeding practices among infants aged 6–36 months and to assess parents' knowledge and behaviors related to infant nutrition.
Methods: The study included 70 parents of infants who had initiated complementary feeding. Data were collected through face-to-face interviews using a structured questionnaire consisting of demographic characteristics, parental health status, infant-related information, complementary feeding practices, and anthropometric measurements of infants. weight-for-age and height-for-age percentiles were evaluated using WHO Anthro Plus software, and values between the 15th and 85th percentiles were classified as normal. Statistical analyses were performed with IBM SPSS Statistics 22.0.
Results: Of the infants, 48.6% were girls and 51.4% were boys, with a mean age of 21.9±9.3 months. Most parents (68.5%) reported introducing complementary foods at 6 months. Nearly all parents stated that they did not add sugar (97.1%) or salt (94.3%) to complementary foods. While 80% reported having knowledge about allergenic foods, only 52.9% had introduced these foods to their infants. Regarding cooking methods, 57.1% preferred boiling and 34.3% preferred baking. Assessment of growth indicators showed that 57.1% of infants had normal body weight and 48.6% had normal height for age, whereas 20.0% had above-normal body weight and 28.6% had above-normal height.
Conclusions: The findings indicate that parents generally follow recommended complementary feeding guidelines; however, the partial application of allergenic food introduction highlights the need for further guidance. The presence of infants with above-normal weight suggests a potential increased risk for future obesity, emphasizing the importance of continued parental education and regular growth monitoring

PV086 / #489

EARLY GROWTH FALTERING AND SUBSEQUENT CHILDHOOD GROWTH

INFANCY INCLUDING DISEASE PREVENTION

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Background and Aims: Growth faltering (GF), defined by **i**nadequate postnatal weight gain during the infancy period, is a recognized risk factor for subsequent conditions such as stunting and failure to thrive. However, the critical threshold or severity of GF necessary to precipitate detrimental effects on long-term growth trajectories remains to be fully elucidated. This study was therefore designed to quantitatively assess the association between varying degrees of GF and anthropometric outcomes at four years of age.
Methods: Data were collected in August 2024 from 12 of 21 Swedish Regions participating in the Swedish Child Health Registry (BHVQ). Children were born 2017- 2019. Inclusion: At least length and weight measurements 28 days apart during the infant period (120–410 days old) and one measurement (height/weight) at the age of 3 years and/or 4 years. The total studied population included 87.369 children (42.725 girls).
Results: 4 % of infants had a relative weight loss defined as more than -1 z-score. Of these, 2.2 % still had underweight grade 2 at 4 y. As many had obesity. 0.2 % had stunting.
Conclusions: Growth faltering (GF) experienced during the first year of life retained a residual impact on anthropometric outcomes in a subset of children at four years of age. This effect was predominantly observed in body mass index (BMI) status, manifesting as both underweight and obesity. Conversely, the impact on linear growth was marginal, with stunting being an infrequent finding in this cohort.

PV087 / #292

MICROBIOME-DIRECTED CARE FOR INFANTS UNDER SIX MONTHS IN LOW-INCOME COUNTRIES: A SCOPING REVIEW

INFANCY INCLUDING DISEASE PREVENTION

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Background and Aims: The first 6 months of life represent a critical developmental window during which infants in low-income countries (LICs) are highly susceptible to infectious diseases and malnutrition, compounded by limited healthcare access. Gut dysbiosis associated with preterm birth, low birthweight (LBW) and undernutrition may increase vulnerability to infections and mortality. Microbiome-directed care, including pre-, pro- and synbiotics, has been proposed to reduce these risks, but its use remains inconsistent and evidence from LICs is limited.
Methods: This scoping review examined evidence on pre-, pro- and synbiotics in infants under six months in LICs. Extracted data included strain, dose, duration, delivery, study design, and effects on the microbiome, morbidity, growth and mortality.
Results: Fifteen studies were included. Evidence for microbiome-targeted interventions in infants is mixed. In preterm and LBW infants, biotics show some effect on necrotising enterocolitis (NEC), mortality, reduced late-onset sepsis (LOS) and shorter time to full enteral feeding. Evidence outside the neonatal period is limited and heterogeneous. Studies in term or LBW infants, and in wasted infants are few, with mixed and often inconclusive findings. Trials in healthy infants also show mixed effects, though some report reduced chronic systemic inflammation and improved gut health, with colonisation effects appearing transient. Evidence integrating mechanistic and functional outcomes is lacking.
Conclusions: Probiotic supplementation in infancy may reduce NEC and LOS in preterm infants in LICs. Further research is needed to clarify whether probiotics can complement proven interventions to support growth and development in infants under six months in LICs.

PV088 / #217

TOXIC METAL CONTAMINATION IN HUMAN BREAST MILK AND ASSOCIATED HEALTH RISKS AMONG INFANTS IN ALGERIA: IMPLICATIONS FOR EARLY-LIFE NUTRITION AND DISEASE PREVENTION

INFANCY INCLUDING DISEASE PREVENTION

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Background and Aims: Breast milk is universally recognized as the optimal source of infant nutrition, providing essential nutrients for healthy growth and immune development. However, environmental contamination can compromise its safety, posing a threat to early-life health. Infants are particularly vulnerable to toxic metal exposure due to immature metabolic and detoxification systems. This study evaluated concentrations of lead (Pb), mercury (Hg), cadmium (Cd), and arsenic (As) in human breast milk and assessed potential health risks to nursing infants in northeastern Algeria.
Methods: A total of 84 breast milk samples were collected from lactating mothers in Guelma, Algeria. Samples underwent microwave-assisted digestion and were analyzed using atomic absorption spectrometry. Exposure assessment was conducted using Target Hazard Quotient (THQ), Hazard Index (HI), and Total Carcinogenic Risk (TCR) for infants aged 1, 6, and 12 months.
Results: Mean concentrations of toxic metals followed the order Pb (15.77 ± 9.54 µg/L) > Hg (3.26 ± 2.50 µg/L) > Cd (2.75 ± 2.39 µg/L) > As (0.35 ± 0.73 µg/L). THQ for Hg exceeded 1 in all infant age groups, with 83%, 82%, and 49% of samples above the threshold at 1, 6, and 12 months, respectively. HI values surpassed 1 across all groups, indicating significant non-carcinogenic risk. TCR was above acceptable limits (1×10^{-4}) for all metals, with Cd showing the highest carcinogenic potential (82% of samples above threshold).
Conclusions: Findings support the establishment of national breast milk monitoring programs, stricter environmental regulations, and maternal nutrition and exposure education to protect infant health during the most vulnerable developmental period.

PV089 / #742

HOW INFANT FORMULA WITH 5 HUMAN MILK OLIGOSACCHARIDES IMPACTS COSTS OVER 12 MONTHS: BUILDING ON THE BRAIN, IMMUNE, AND GUT HEALTH (BIG) STUDY

INFANCY INCLUDING DISEASE PREVENTION

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Background and Aims: Human milk oligosaccharides (HMOs) are the third most abundant solid component in human milk. Advances in infant nutrition have enabled inclusion of multiple HMOs in infant formula, with clinically demonstrated benefits. This study evaluated the economic benefits of feeding infants a formula containing five HMOs (5-HMOs) compared with a formula without HMOs (0-HMOs).
Methods: This study assessed 12-month costs associated with healthcare visits, antibiotic use, and allergy or gastrointestinal (GI) adverse events (AEs). Clinical inputs were derived from the Brain, Immune, and Gut health (BIG) randomized controlled trial, which fed infants either a formula with 5-HMOs or 0-HMOs from enrollment to 12 months. Healthcare cost parameters were obtained from the published literature and expressed in 2025 USD.
Results: Non-routine healthcare visits, infection-related antibiotic prescriptions, and allergy/GI AEs generated estimated per-infant cost savings of US$319 for healthcare visits, US$8 for antibiotic use, and US$35 for allergy/GI AEs. Per-infant savings, net of formula cost differences, were US$242 over 12 months. Projecting these results to all exclusively formula-fed infants, population-level savings were US$154.6 million for healthcare visits, US$3.7 million for antibiotics, and US$17.1 million for allergy/GI AEs. Net of formula cost differences, (US$57.9 million), national savings were US$117.5 million.
Conclusions: Compared to 0-HMO formula, infant formula with 5-HMOs provides meaningful economic benefits that complement clinical benefits and support its value for families and the broader healthcare system.

PV090 / #670

WHAT DO YOU KNOW ABOUT CONSTIPATION?

INFANCY INCLUDING DISEASE PREVENTION

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Background and Aims: Pediatric constipation, defined by Rome III/IV criteria, affects 3–14% of children, most with functional constipation. It is a common reason for seeking healthcare, with diagnosis based on clinical evaluation and initial management focused on dietary and behavioral methods. Highlighting the role of family education, this study aims to assess parental literacy regarding pediatric constipation, particularly home management, to better inform educational strategies used by healthcare professionals in clinical and emergency settings.
Methods: This observational cross-sectional study used a structured questionnaire for caregivers of children, excluding healthcare workers. Data were analyzed in JASP using descriptive statistics and inferential methods to examine associations with sociodemographic variables.
Results: 102 questionnaires were analysed. Most caregivers had 2–3 children, 58.1% had higher education, 14.9% worked with children and 1.4% reported no regular follow-up. 54.1% had previously seeked information on constipation and 12.2% had a child with this condition. The question with the highest success rate (71.6%) concerned stool types associated with constipation. The lowest success rate (9.5%) related to the effects and management of medication. The mean number of correct answers was 2.6. Inferential analysis showed no statistically significant association between overall performance and caregiver education level, job, the searching for information or number of children. Medication-administering caregivers showed no better item performance. A significant association was identified for caregivers of children diagnosed with constipation, who scored higher overall.
Conclusions: Caregivers' overall knowledge of pediatric constipation is low and unrelated to education. Information appears more effectively conveyed by healthcare professionals when the child is diagnosed. The study's main limitation is its sample size.

PV091 / #553

INFANT FEEDING PRACTICES AMONGST CAREGIVERS OF INFANTS AGED 0-6 MONTHS IN TSHWANE DISTRICT.

INFANCY INCLUDING DISEASE PREVENTION

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Background and Aims: WHO advises exclusive breastfeeding for the first 6 months, followed by age-appropriate, nutrient-rich complementary foods (iron, calcium, vitamin A) and continued breastfeeding up to 2 years or beyond. However, global evidence shows that many countries fall short of these targets, resulting in sub-optimal breastfeeding rates, delayed complementary feeding, and increased risk of malnutrition and infection among infants.
This study assessed infant-feeding practices among caregivers of infants aged 0-6 months in the Tshwane District of Gauteng Province, South Africa, with the intent of identifying modifiable gaps and generating evidence to inform targeted interventions.
Methods: A cross-sectional survey employing a mixed-methods (quantitative + qualitative) design was conducted. A total of 251 caregivers were recruited from primary health clinics in Tshwane Municipality. Structured questionnaires captured sociodemographic data, breastfeeding history, complementary food introduction, and reasons for deviation from recommended practices. In-depth interviews with a purposive sub-sample explored barriers such as perceived low milk supply, time constraints due to employment, lack of social support, and cultural misconceptions. Data were analyzed using descriptive statistics and thematic analysis
Results: Only 29 % of mothers reported exclusive breastfeeding for the first 6 months, while 18 % never initiated breastfeeding and majority were mix-feeding. Qualitative insights highlighted common barriers: perceived insufficient milk (42 %), inflexible work schedules (31 %), and inadequate support from partners or elders (27 %) .
Conclusions: The study underscores significant gaps in infant-feeding practices in Tshwane, mirroring national trends. There is an urgent need for interventions such as workplace lactation policies, community-based counseling, and targeted education to empower caregivers and improve infant nutrition and health outcomes.

PV092 / #624

RICKETS IN CHILDREN - OLD DISEASE BUT STILL IN TREND

INFANCY INCLUDING DISEASE PREVENTION

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Background and Aims: Rickets is known since ancient times but it had been passed 18 centuries until the first description and etiology and 2 centuries to discover the cure. Still, rickets remains “an old disease” very common during childhood, associated with poor nutrition. The aim of our study was to determine the incidence of nutritional rickets among children in District Brasov, the association with other nutritional deficiency and the efficiency of the prophylaxis promoted by medical policy.
Methods: It had been performed a retrospective study over 5 years (January 2020 - December 2024) on children aged between 6 months and 3 years old. There were reviewed the medical records and collected data regarding personal history (rank, gestational age, birth weight, alimentation, rickets prophylaxis with vitamin D), life condition (smoking of the parents), life style as sun exposure, anthropometric features, blood tests.
Results: The study involved 456 patients (from 27.500 admitted). Infants were more affected than toddlers (54,16% vs 45,83%), boys more than girls (67,11% vs 32,89%). The higher rank of the child in family, the high risk of developing rickets (76,97% vs 23,02%). Prematurity was associated with rickets (63,59% vs 36,40%). Alimentation from birth was also involved significantly, higher incidence of rickets in children with incorrect alimentary habits (58,11% vs 41,88%). Lack of rickets prophylaxis was significant (56,14 vs 43,85%).
Conclusions: Despite of efforts of medical community in education of the population regarding alimentation, healthy enviroment, prophiylaxis, and the large availability of vitamin D supplemets nutritional rickets still remains a problem in our country. It has to be reassess every link of this chain and adapted to reality.

PV093 / #665

FEEDING PATTERNS AND THE RISK OF PERIANAL ABSCESS IN EARLY INFANCY: A CASE–CONTROL STUDY

INFANCY INCLUDING DISEASE PREVENTION

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Background and Aims: Breastfeeding is widely recognized as protective against infectious morbidity in infancy through immunologic, anti-inflammatory, and microbiome-mediated mechanisms. Whether exclusive breastfeeding influences the risk of *perianal abscess*, a relatively common condition in early infancy, remains unclear. This study aimed to evaluate the association between infant feeding patterns and the development of perianal abscess.
Methods: We conducted a matched case–control study including 89 male infants diagnosed with perianal abscess and 82 male controls who underwent elective inguinal hernia repair during the same period. All infants were aged ≤6 months at the time of presentation or surgery. Epidemiologic characteristics, recurrence rates, microbiologic findings, and feeding practices (exclusive breastfeeding, exclusive formula feeding, mixed feeding) were collected and compared. Logistic regression was used to assess the association between feeding pattern and odds of abscess, adjusting for age and prematurity.
Results: Mean age was similar between groups (2.3 vs. 2.5 months). Among infants with perianal abscess, 46% were exclusively breastfed, 23.6% exclusively formula-fed, and 30.3% mixed-fed. In controls, the corresponding rates were 39%, 40%, and 21%, respectively. Overall feeding distribution did not differ significantly (p=0.056). Exclusive breastfeeding was not associated with reduced odds of abscess (OR 0.81; 95% CI 0.38–1.73), whereas exclusive formula feeding was associated with lower odds compared with mixed feeding (OR 0.40; 95% CI 0.18–0.91).
Conclusions: In this cohort of male infants under six months, exclusive breastfeeding did not appear to protect against perianal abscess. Mixed feeding was more common among affected infants, which may reflect the transient microbiologic shifts that occur during partial weaning or combined feeding.

PV094 / #770

LONGITUDINAL PFAS PLASMA LEVELS IN HEALTHY DUTCH CHILDREN

INFANCY INCLUDING DISEASE PREVENTION

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Background and Aims: Per- and polyfluoroalkyl substances (PFAS) are non-biodegradable chemicals. They accumulate in humans and pose potential adverse effects, especially in vulnerable periods of development in childhood. In our Sophia Pluto Cohort Study, exclusively breastfed children had 3 times higher PFAS plasma levels at age 3 months than exclusively formula-fed and levels remained 2-3 times higher at 2 years. We investigated longitudinal PFAS plasma levels between birth and 5 years and studied determinants.
Methods: In 466 healthy term-born Dutch children, we measured plasma PFOS, PFOA, PFHxS, PFNA and PFDA levels at age 3 months, 2 years or 5 years, using liquid chromatography-electrospray-ionization-tandem-mass-spectrometry (LC-ECI-MS/MS), and studied the trajectories and associations with several factors.
Results: For all PFAS, except for PFOA, levels slightly decreased between age 3 months and 2 years and subsequently increased to 5 years. For PFOA, levels decreased between 3 months and 5 years. PFAS levels at 5 years did not differ for sex, and remained 1.5 times higher when children received exclusive breastfeeding during the first 3 months compared to exclusive formula feeding. Plasma PFAS levels at 3 months and 2 years were positively related to levels at 5 years.
Conclusions: Our preliminary results show that plasma PFAS levels increased slightly from age 2 to 5 years, except for PFOA. PFAS levels remained higher in 5-year-old children who received exclusive breastfeeding in the first 3 months of life, suggesting feeding type in early infancy affects PFAS levels at older age. Currently, lifestyle determinants, maternal and child characteristics are being analyzed.

PV095 / #394

POLY- AND PERFLUOROALKYL SUBSTANCES (PFAS) ASSOCIATE WITH ALTERATIONS IN ADIPOKINE LEVELS AND EATING BEHAVIOR IN THE FIRST 2 YEARS OF LIFE

INFANCY INCLUDING DISEASE PREVENTION

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Background and Aims: Human milk is an important exposure pathway for non-degradable PFAS. In contrast to breastfeeding, PFAS have been thought to negatively influence growth, body composition and metabolic health in children. Appetite regulating hormones(ARHs) and eating behavior are potential pathways. We investigated the influence of feeding on plasma ARHs and eating behavior and the associations between PFAS, ARHs and eating behavior, during the first 2 years of life.
Methods: This study was embedded in the Sophia Pluto cohort study, investigating 371 healthy term-born infants (150 exclusively breastfed, 97 exclusively formula-fed and 124 mixed-fed). At 3 months and 2 years, we studied eating behavior via validated questionnaires and plasma levels of 5 individual PFAS and 9 ARHs were measured in fasting plasma samples. The associations of PFAS and feeding type with ARHs and eating behavior were studied using multiple regression models, corrected for confounders.
Results: Only at age 3 months plasma ARH levels differed between feeding types. Higher PFAS levels at age 3 months were associated with higher adiponectin and lower leptin levels and at age 2 years with lower leptin and insulin levels**.** Eating behavior did not differ between feeding types. At age 3 months, PFAS levels were inversely associated with “food responsiveness”, and positively with “slowness in eating” and at age 2 years inversely associated with all “food approach” subscales.
Conclusions: PFAS seem not to diminish breastfeeding’s health benefits on metabolic health and insulin sensitivity until age 2 years and that they probably affects eating behavior via other pathways than ARHs.

PV096 / #361

BALANCING MACRONUTRIENTS FOR OPTIMAL RECOVERY: EVIDENCE-BASED CALORIC AND PROTEIN TARGETS IN MANAGING UNDERNOURISHED CHILDREN

MALNUTRITION

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Background and Aims: Background: Undernutrition in children—manifesting as underweight and wasting—remains a major global health concern. Optimizing macronutrient intake is critical for effective nutritional rehabilitation, yet debate persists on whether prioritizing protein or increasing energy from carbohydrates and fats yields better outcomes. **Objective:**
To determine the most effective macronutrient strategy—protein-focused vs. energy-dense—for treating undernourished children, and to quantify their relative impact on weight gain and linear growth based on recent evidence.
Methods: Reviewed were 30 studies (2000–2025) examining dietary interventions in undernourished children. Macronutrient strategies were categorized and scored based on frequency and strength of outcomes in weight gain, height gain, and recovery speed. Recommended intake thresholds were compiled.
Results: Protein was a critical driver of **linear growth**, with intake of **3.5–4.6 g/kg/day** significantly improving height-for-age z-scores and lean mass. Caloric intake of **≥130 kcal/kg/day** was necessary for rapid **weight gain**, especially when matched with adequate protein. Carbohydrates and fats provided essential energy for catch-up growth, but unbalanced energy intake without sufficient protein led to fat accumulation rather than lean growth. Special formulas such as **Lipid-Based Nutrient Supplements (LNS)** were superior to regular foods in speed of recovery. Balanced macronutrient diets consistently produced the **best overall outcomes**.

Relative Impact of Therapies (Score out of 10)

Therapy	Estimated Impact Score	Primary Benefits
Balanced Diet (Protein + Energy)	9.5	Best results in weight gain + linear growth
Lipid-Based Nutrient Supplements (LNS)	9.0	Fastest recovery in moderate/severe wasting
High Protein Intake (≥3.5 g/kg/day)	8.5	Strong driver of linear growth and lean mass
High Carbohydrate Intake	7.5	Promotes weight gain when energy-deficient
High Fat Intake	7.0	Efficient calorie source; must be paired with protein

Table: Macronutrient Impact on Undernutrition in Children

Macronutrient	Effect on Undernutrition	Key Insight
Protein	Strongly associated with reduced underweight, stunting, and wasting [Suryana et al., 2024); (Anwar & Setyani, 2022)]	Critical for growth, tissue repair, and lean body mass
Carbohydrates	Associated with weight gain and reduced wasting, especially when energy intake is adequate [Aisyah et al., 2024); (Elliott et al., 2011)]	Primary energy source for rapid recovery
Fats	High-energy density aids in weight gain; lipid-based supplements outperform basic blends [(Cichon et al., 2023)]	Efficient calorie delivery essential for rapid catch-up growth
Balanced Diet	Diets combining protein + energy (carbs/fats) yield best recovery outcomes [(Park & Kim, 2023); (Badrashi et al., 2018)]	Synergistic effect—balanced intake outperforms single macronutrient focus
Special Formulas	Lipid-based nutrient supplements (LNS) or milk-based formulas improve recovery rates in wasting [Cichon et al., 2023); (Herber et al., 2020)]	Programmatic tools for rapid treatment and refeeding

Conclusions: To achieve optimal recovery in undernourished children, **adequate energy (≥130 kcal/kg/day)** and **high protein intake (3.5–4.6 g/kg/day)** are essential. The **most effective strategy** is a **balanced macronutrient approach**, often delivered via **specialized formulas like LNS**, which maximize weight and height gains. Calorie-only strategies without protein are suboptimal and may increase fat mass rather than support lean growth.

PV097 / #407

NUTRITION MATTERS: HOW CHILDREN WITH AUTISM SPECTRUM DISORDERS AND CEREBRAL PALSY MEET (OR MISS) DIETARY RECOMMENDATIONS

MALNUTRITION

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Background and Aims: Healthy nutrition is essential for physical and mental well-being. Children with autism spectrum disorders (ASD) and cerebral palsy (CP) often face eating challenges. ASD children prefer high-energy, low-nutrient foods, which affects metabolism and increases oxidative stress. In CP-children, sensorimotor impairments hinder chewing, swallowing, and oral sensory processing, often leading to malnutrition and growth delays. To investigate the frequency of food intake from major food groups among children with ASD and CP in Northeastern Bulgaria.
Methods: A cross-sectional study was conducted from August 2023 to November 2024. A Food Frequency Questionnaire was applied. Statistical analysis was performed with Jamovi software (v2.6.23). The results were compared to national dietary recommendations
Results: The mean age of participants (102 children with ASD and 44 with CP) was 6.41±2.68 years. Daily cereal consumption was found in 10.1% of ASD children and 15% of CP children (p=0.331). Daily fruit and vegetable intake was significantly higher among CP children (63.8%) compared to those with ASD (8%). More ASD children met the weekly recommendations for fish (68.8% vs. 17.5%, p<0.001) and meat (51.5% vs. 46.2%, p=0.029) consumption. The highest proportion of children consuming milk 4–5 times weekly was 52.6%, predominantly those with CP (85%, p<0.001). Daily dairy intake was more frequent among ASD children (15.3% vs. 5.1%, p<0.001).
Conclusions: Children with ASD and CP in Northeastern Bulgaria demonstrate different patterns of food intake compared to national recommendations for healthy eating. These findings highlight the need for individualized nutritional interventions tailored to the specific challenges.

PV098 / #215

GUMS VS COW'S MILK BRIDGING NUTRITIONAL GAPS FOR TODDLERS

MALNUTRITION

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Background and Aims: Early dietary patterns develop rapidly within the first two years of life, with evidence that diet quality may decline as children age, evaluating diet quality in paediatric populations is of increasing interest, lacking evidence-based dietary guidelines for toddlers, combining these multidimensional behaviours into a single meaningful measure remains a challenge
Methods: There is limited research on the contribution of milk to the diets of toddlers whether Growing Up Milks (GUM) provide a nutritional advantage compared to standard cow's milk (CM) . Simulation data have shown that replacing CM with GUM resulted in protein intakes more in line with recommendations, reduced saturated fatty acid (SFA) intake and increased likelihood of adequate intakes of vitamin D and iron.
Results: The consumption of GUM was associated with higher nutritional adequacy of the diets of toddlers, with increased likelihood of meeting nutrient requirements.more likely to have carbohydrate and SFA intakes in line with recommendations and improved iron and vitamin D intakes. Although GUM had a positive effect on index scores, consumption toward the latter half of second year of life may not have the same impact as during early childhood as previously reported in younger children according to GUM consumption. This may be because in the latter part of the second year of life,
Conclusions: Dietary strategies to promote a healthy diet through optimising nutrient intake could also result in more favourable dietary intake profiles, rather than solely concentrating on milk, however, further research is required on the consequences of consuming GUM on overall dietary diversity.

PV099 / #758

IMPROVEMENT IN GROWTH AND NUTRITIONAL STATUS VIA FAMILY-BASED NUTRITION PROGRAM IN A 7-YEAR-OLD BOY WITH AUTISM SPECTRUM DISORDER AND SEVERE PICKY EATING: A CASE REPORT

MALNUTRITION

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Background and Aims: Children with autism spectrum disorder (ASD) and intellectual disability often exhibit severe picky eating due to sensory processing issues, restricted food preferences, and behavioral factors, leading to inadequate energy intake, growth faltering, constipation, and potential micronutrient deficiencies. This case describes the management and outcomes of a 7-year-old boy with ASD, moderate intellectual disability, and chronic picky eating who participated in a 12-month multidisciplinary family-based community nutrition program.
Methods: The study subject was recruited in a structured community nutrition program for children with special healthcare needs. Interventions included detailed food acceptance/rejection profiling, caregiver education on responsive feeding, stages of eating, strategic exposure, positive reinforcement, food chaining, and behavioral techniques. Nutritonal status was closely reviwed including (1) management of constipation (probiotics, lactulose, dietary fibre), (2) review of micronutrient supplementation (vitamin C, probiotics, omega-3 fatty acids) (3) review of diet records; and (4) anthropometric monitoring (height, weight, BMI).
Results: Over 12 months, height increased from 115.6 cm to 119.0 cm, weight from 22.3 kg to 24.3 kg (BMI 17.1 kg/m^2, shift toward higher percentile, i.e. 25-50th range). Improvements were shown in (i) acceptance of new items (e.g., moringa leaves, minced pork with pasta, chicken gravy), (ii) better bowel habits (from 1-2/week to 4-5/week with increased fibre and fluid intake), (iii) enhanced energy intake via accepted foods and supplements, and (iv) family involvement in meal planning. No adverse effects noted.
Conclusions: This community program approach addresses growth faltering in neurodevelopmental disorders and supports long-term nutritional health. Larger studies are needed to evaluate efficacy and scalability in similar pediatric populations.

PV100 / #416

SILENT MALNUTRITION IN CHILDREN WITH CONGENITAL HEART DISEASE: A PROSPECTIVE STUDY OF 100 SURGICAL PATIENTS

MALNUTRITION

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Background and Aims: Malnutrition is a common but frequently underdiagnosed comorbidity in children with congenital heart disease, significantly influencing perioperative physiology, postoperative outcomes.
To determine the prevalence of silent malnutrition in children undergoing CHD surgery, characterize its biochemical and anthropometric patterns, evaluate its association with postoperative instability.
Methods: We conducted a prospective, observational study of 100 children aged 1–60 months undergoing corrective or palliative CHD surgery. Anthropometric indices (WAZ, HAZ, WHZ), serum protein profile (albumin, prealbumin), micronutrient markers (ferritin, transferrin), and total lymphocyte count were evaluated preoperatively. Perioperative data included cardiopulmonary bypass duration, cross-clamp time, lactate kinetics, vasoactive-inotropic score (VIS), ventilation duration, and ICU stay. Malnutrition was classified per WHO criteria.
Results: Moderate-to-severe malnutrition (WAZ < –2) was identified in 42% of patients, with biochemical evidence of protein-energy deficiency in 47% (albumin < 3.5 g/dL). Malnourished children demonstrated higher peak lactate levels (median 5.1 vs. 3.2 mmol/L; $p < 0.01$), prolonged mechanical ventilation (32 vs. 18 hours; $p < 0.01$), higher VIS at 24 hours (21 vs. 11; $p < 0.001$), and longer ICU stay (4.8 vs. 2.6; $p < 0.001$). Preoperative albumin and WAZ strongly correlated with VIS ($r = –0.63$ and –0.58, respectively). Multivariate regression identified malnutrition as an independent predictor of postoperative hemodynamic instability.
Conclusions: Silent malnutrition is highly prevalent in children presenting for CHD surgery and serves as a potent, independent determinant of perioperative instability and postoperative resource use. Mandatory nutritional screening—including anthropometrics and biochemical assessment—should be integrated into preoperative pathways. Early identification and targeted nutritional optimization may substantially improve outcomes.

PV101 / #749

COMPARISON OF ANTHROPOMETRIC MEASUREMENTS USED IN THE DIAGNOSIS OF MALNUTRITION IN THE FIRST SIX YEARS OF LIFE

MALNUTRITION

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Background and Aims: Patients referred to the Pediatric Gastroenterology Outpatient Clinic due to undernutrition and growth retardation were evaluated.
Methods: Height and weight measurements of the patients were assessed according to the World Health Organization (WHO) growth percentile charts. In addition to these measurements, mid-upper arm circumference (MUAC) and triceps skinfold thickness were measured. A total of 118 patients were included in the study. Weight-for-age SDS < −2 was identified in 43 cases, height SDS < −2 in 70 cases, BMI SDS < −2 in 18 cases, and MUAC Z-score < −2 in 47 cases. A statistically significant correlation was found among BMI (kg/m^2), MUAC (mm), and triceps skinfold thickness measurements ($p < 0.001$).
Results: Various anthropometric methods can be used in the assessment of malnutrition. In this study, a significant correlation was observed between MUAC and triceps skinfold thickness measurements. The combined use of these two measurements may be particularly useful in patients with neurological deformities in whom accurate height and weight measurements cannot be reliably obtained.
Conclusions: Various anthropometric methods can be used in the assessment of malnutrition. In this study, a significant correlation was observed between MUAC and triceps skinfold thickness measurements. The combined use of these two measurements may be particularly useful in patients with neurological deformities in whom accurate height and weight measurements cannot be reliably obtained.

PV102 / #746

FOLLOW-UP OF LEFT MID–UPPER ARM CIRCUMFERENCE IN A 5-YEAR-OLD PATIENT WITH CEREBRAL PALSY

MALNUTRITION

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Background and Aims: Anthropometric assessment cannot be performed adequately in patients with neurological sequelae and permanent contractures of the extremities. Because accurate measurements cannot be obtained, percentile calculations often do not reflect the actual nutritional status. This case report aims to emphasize that measurement of the left mid–upper arm circumference (MUAC) is effective in follow-up and should be used more frequently in clinical practice.
Methods: A 5-year-old child with cerebral palsy presented with growth retardation. Body weight was 12 kg (WHO SDS: –3.46). Height could not be measured because of lower extremity contractures. Left MUAC was 11 cm, and severe malnutrition was diagnosed. The patient was receiving only 50% of the recommended daily caloric intake. A peptide-based hypercaloric enteral nutrition formula was added, providing 130% of age-appropriate caloric requirements. After two months, body weight increased to 14 kg (SDS: –2.19) and MUAC to 11.5 cm. At five months, body weight reached 16 kg (SDS: –1.12) and MUAC 12 cm.
Results: In patients with permanent neurological disorders who are non-ambulatory, irreversible muscle and joint deformities may develop. In such cases, performing anthropometric assessments often becomes nearly impossible. Measurement and periodic follow-up of the left mid–upper arm circumference are of vital importance for the diagnosis and monitoring of malnutrition in these patients. MUAC measurement should be used more frequently in daily clinical practice.
Conclusions: MUAC measurement is a simple, reliable, and essential tool for diagnosing and monitoring malnutrition in non-ambulatory children with cerebral palsy when standard anthropometric measurements are not feasible.

PV103 / #634

DGAT1 DEFICIENCY ENTEROPATHY: CRITICAL IMPACT OF TARGETED NUTRITIONAL MANAGEMENT

MALNUTRITION

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Background and Aims: DGAT1 deficiency is a rare congenital diarrheal disorder characterized by early-onset chronic diarrhea and protein-losing enteropathy, leading to severe malnutrition during infancy. Nutritional management is essential and requires extreme fat restriction and prevention of macronutrient and micronutrient deficiencies. This report aims to describe the nutritional approach and clinical evolution of an infant with genetically confirmed DGAT1 deficiency, highlighting the impact of targeted dietary intervention.
Methods: A detailed clinical and nutritional evaluation was performed in a 6-week-old infant with persistent diarrhea and severe protein-calorie malnutrition. Infectious, inflammatory and protein loss markers were assessed. Digestive endoscopies with biopsies were normal, and due to persistent symptoms despite elemental formula, targeted genetic testing was undertaken. Nutritional intervention included parenteral nutrition and the use of a very low-fat enteral formula supplemented with essential fatty acids.
Results: Endoscopic and histological findings were normal, and diarrhea remained osmotic with elemental formula. A targeted genetic testing identified a homozygous *DGAT1* mutation. After the diagnosis, a very low-fat enteral formula (1.2% of total energy) was introduced, supplemented with flaxseed oil to ensure an optimal intake of essential fatty acids. The patient showed progressive improvement with complete resolution of diarrhea. At 3 years old, the patient remains asymptomatic from the gastrointestinal point of view, showing adequate growth and normal nutritional parameters while following a low-fat diet with essential fatty acid supplementation.
Conclusions: DGAT1 deficiency should be considered in infants presenting protein-losing enteropathy. Strict fat restriction, together with targeted nutritional supplementation, enables a favorable clinical and nutritional outcome.

PV104 / #503

UNDERSTANDING CHILDHOOD UNDERNUTRITION IN BURUNDI: PREVALENCE, PATTERNS, AND KEY DETERMINANTS

MALNUTRITION

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Background and Aims: Malnutrition remains a major public health challenge globally and continues to severely affect children in low-income countries such as Burundi. This study aimed to estimate the prevalence and identify determinants of undernutrition among children aged 6–59 months, using data from the 2019 National Survey on Nutritional Status and Food Security.
Methods: A secondary analysis was conducted using nationally representative cross-sectional data. The analytical sample included children with complete anthropometric and household information. Anthropometric indices—height-for-age, weight-for-height, and weight-for-age Z-scores—were computed using WHO Child Growth Standards to classify stunting, wasting, and underweight. Explanatory variables included sociodemographic and socioeconomic characteristics, maternal nutritional status, infant and young child feeding practices, water, sanitation and hygiene conditions, household livelihoods, and recent child morbidity. Descriptive statistics quantified malnutrition distribution, while bivariate analyses with chi-square tests assessed associations between outcomes and determinants at a 5% significance level.
Results: show that all forms of undernutrition are widespread across Burundi, with chronic malnutrition being the most prevalent. Karusi Province recorded the highest stunting rate (67.3%), and children aged 24–59 months exhibited the highest chronic malnutrition burden (61.6%). Rural areas were particularly affected, with 30.6% of children experiencing wasting and 59.4% stunting. Larger households (≥5 members) accounted for 59.1% of chronically malnourished children. Child age and sex, household poverty, maternal body mass index, and recent diarrhoeal episodes were significantly associated with all forms of undernutrition.
Conclusions: These findings highlight the need for targeted, context-specific interventions that address food availability, household consumption practices, and the broader determinants of child nutrition in Burundi.

PV105 / #396

MID-UPPER ARM CIRCUMFERENCE (MUAC) ACROSS THE PEDIATRIC SPECTRUM: A PRACTICAL TOOL FOR DETECTING MALNUTRITION, LOW BIRTH WEIGHT, AND OBESITY WITH AGE-SPECIFIC CUT-OFF POINTS

MALNUTRITION

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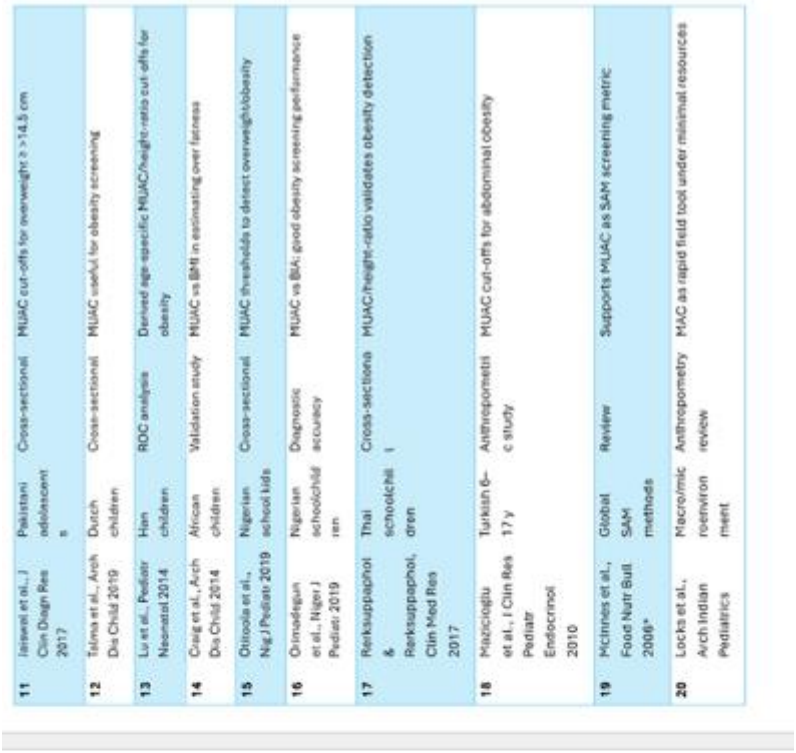
Background and Aims: Mid-Upper Arm Circumference (MUAC) used to assess nutritional status in children. Initially designed for detecting acute malnutrition, MUAC is now valuable across all pediatric age groups and correlates strongly with weight and body mass index (BMI), making it useful for screening both undernutrition and obesity. Aims: Summarize the clinical utility of MUAC across pediatric age groups, evaluate its correlation with traditional growth parameters, and establish evidence-based cut-off points for malnutrition and obesity detection.

Methods: Findings from 20 peer-reviewed studies (1994–2024) and WHO/UNICEF guidelines, focusing on the correlation between MUAC and growth indices, age-specific diagnostic cut-offs, and its application in various settings. Simulated line graphs were created to illustrate the correlation strength between MUAC and weight, height, and BMI using relevant statistical values.
Results: Results: Correlation with growth metrics: MUAC vs **Weight**: **r ≈ 0.85**, $p < 0.001$ MUAC vs **BMI**: **r ≈ 0.75**, $p < 0.001$ MUAC vs **Height**: **r ≈ 0.60**, $p < 0.001$ **Diagnostic Cut-offs by Age Group: < 9.0 cm** in neonates indicates **low birth weight (LBW)**. **< 11.5 cm** (6–59 months) defines **severe acute malnutrition (SAM)**; **< 12.5 cm** for moderate malnutrition. **> 14.5–16.0 cm** in school-age children and adolescents indicates **overweight/obesity**, with ROC-based



11	Inisesi et al., J Clin Diagn Res 2017	Pakistani adolescents	Cross-sectional	MUAC cut-offs for overweight ≥ >14.5 cm
12	Talma et al., Arch Dis Child 2019	Dutch children	Cross-sectional	MUAC useful for obesity screening
13	Lu et al., Pediatr Neonatol 2014	Han children	ROC analysis	Derived age-specific MUAC/height-ratio cut-offs for obesity
14	Craig et al., Arch Dis Child 2014	African children	Validation study	MUAC vs BMI in estimating over fatness
15	Otitoola et al., Nig J Pediatr 2019	Nigerian school kids	Cross-sectional	MUAC thresholds to detect overweight/obesity
16	Orimadegun et al., Niger J Pediatr 2019	Nigerian schoolchildren	Diagnostic accuracy	MUAC vs BIA; good obesity screening performance
17	Reksuppapinol & Reksuppapinol, Clin Med Res 2017	Thai schoolchildren	Cross-sectional	MUAC/height-ratio validates obesity detection
18	Mazicioglu et al., J Clin Res Pediatr Endocrinol 2010	Turkish 6–17 y	Anthropometric study	MUAC cut-offs for abdominal obesity
19	McInnes et al., Food Nutr Bull 2006*	Global SAM methods	Review	Supports MUAC as SAM screening metric
20	Locks et al., Arch Indian Pediatrics	Macro/microenvironment	Anthropometry review	MAC as rapid field tool under minimal resources

Table : The relationship between **mid-upper arm circumference (MUAC/MAC)** and growth parameters (weight, height, BMI)

#	Author + Journal + Year	Subjects	Study Type	Findings & Clinical Cut-offs
1	Ramoiya et al., Trop Geogr Med 1994	Neonates, Dar es Salaam	Observational	MAC correlated strongly with birth weight; useful when scales unavailable
2	Das et al., BMRC Bull 2005	Bangladesh infants	Cross-sectional	MAC < 9 cm = LBW (sens 92%, spec 90.5%)
3	Ramoiya C et al.) Trop Pediatr 2007	Tanzanian infants	Diagnostic accuracy	MAC validated as LBW proxy with 9 cm cut-off
4	Centemole et al., J Emerg Med 2009	UK children	Cross-sectional	MAC correlates with weight better than age/height/foot-length
5	Sudfeld et al., Am J Clin Nutr 2015	Tanzanian children 6–59 mo	Longitudinal cohort	MAC predicts thinness/stunting; correlates with BMI z-score
6	Gretley & Golden, BMC Nutr 2016	LMIC children surveys	Policy review	MUAC < 115 mm defines SAM; < 125 mm GAM. MUAC and WHZ capture different children
7	Isenske et al., PLoS One 2015	SAM children	Cohort	MUAC/WHZ discrepancies affect treatment eligibility
8	Das et al., BMC Emerging viruses	Macrocephalic toddlers 6–36 mo	Cross-sectional	MUAC detects malnutrition better than BMI/WFL in macrocephaly
9	Scientific article (2008)	Children & adolescents	Survey	MAC correlates with BMI, obesity detection in school-age youth
10	Sisay et al., Public Health Nutr 2022	Adolescents (n=944)	Systematic review	AUC=0.93 for obesity detection; high sensi/spec

validation.

Conclusions: Conclusion:

MUAC is reliable &cost-effective measure correlates strongly with weight and BMI. It is essential for screening both undernutrition,obesity and should be included in routine pediatric growth assessments and public health surveillance. **Clinical Implications** Pediatric healthcare providers should consider MUAC as a rapid and informative tool for nutritional assessment. Age-specific MUAC and MUAC/height ratios enhance diagnostic precision in both community and clinical settings.

PV106 / #210

FOOD MINERAL LEVEL OF HOME GROWN WATER LEAF (TALINIUM TRIANGULARE)

MALNUTRITION

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Background and Aims: To determine the quantity of selected Food Mineral in Water Leaf (*Talinium triangulare*
Methods: Water Leaf (*Talinium triangulare*), a class of leafy vegetable was grown in the home garden in Ibadan, Nigeria for weeks, after which samples were plucked, and taken to the Laboratory at IITA, Ibadan for Mineral analysis. The method described by Association of Official Analytical Chemists (2005) was used for the analysis of the minerals. Initially, Aqua regia solution was prepared in a 2litre volumetric flask as follows, 1.2 litre of distilled water was added to the flask, followed by 400ml of Concentrated Hydrochloric acid and 133ml of 70% nitric acid. The resulting solution was diluted to 2 litres. 0.52g of the powdered samples above were put in clean ceramic crucibles in duplicate and were placed in a cool muffle furnace and ramp at a temperature of 5000C over a period of 2 hours. The procedures were completed with Atomic Absorption Spectrophotometer (AAS) to determine the level of minerals.
Results: The results obtained for water leaf mineral were Nitrogen amount of 4.37%, Phosphorus 0.35%, Calcium 1.57%, Potassium 3.04%, Sodium 22.25 ppm and Manganese 320.63ppm among others.
Conclusions: Consumption of Water leaf could be highly beneficial to our health, especially due to its high amount of Manganese which is 320.63 ppm, highest compared to other leaf vegetables; as an important co-factor in metabolism and as a neuro-toxin.

PV107 / #211

OPTIMISING LEAFY INDIGENOUS VEGETABLES AS FUNCTIONAL FOODS – NIGERIAN CASE STUDY

MALNUTRITION

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Background and Aims: Developing countries like Nigeria are facing myriad of problems, ranging from economic challenges, lack of job, food insecurity, malnutrition. Tackling these menace is complex, but this work examines and enlightens the scientific community to take optimal nutritional advantage of the consumption of indigenous leafy vegetables for improved wellbeing.
Methods: The method described by Association of Official Analytical Chemists (2005) was used for the analysis of the minerals.The procedures were completed with Atomic Absorption Spectrophotometer (AAS) to determine the level of minerals.
Results: Nigerian leafy indigenous vegetables on home grown setting revealed for example, the potential use of Iron (Fe) amount of 318.15ppm in Basella alba (red species) and that of Telfaria Occidentalis (Ugu) with 261.22ppm as being useful to stimulate heme synthesis. Moreso, Virnonia amygdalina (ewuro) and water leaf possesses anti-bacteria and anti-diabetic properties. Also, medicinal plant like Morinda citrifolia (Noni), which had been found to possess anti-cancer properties has a Vitamin c amount of 528.85 mg/100g and a total carotenoids amount of 85.50 µg/g.
Conclusions: These leafy vegetables are functional foods, often contain bioactive compounds, which helps the body through the prevention and management of various diseases, as well as improving the overall health of human beings. So many people have this around their homes, but lack its nutrition advantage, hence fail to take proper use of them. According to Sarumi et. al., there is no plant created by God that is useless.

PV108 / #123

GROWTH PERFORMANCE AND ANTHROPOMETRIC MEASUREMENTS ON WEANING WISTAR RATS FED BAMBARA GROUNDNUT FORMULATED DIETS

MALNUTRITION

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Background and Aims: Background and aims To showcase the potentials of Bambara Groundnut in the support of growth and ability to combat malnutrition
Methods: Bambara Groundnut (Vigna subterranea (L.) verdc.), being a nutrient dense food, complete in the bioavailable nutrients had been found to be an economic useful legume. Here, Bambara Groundnut (Vigna subterranea (L.) verdc.) formulated diets were used in this nutrition work, with thirty (30) weaning wistar rats, comprising (six groups), including the test groups, the positive and the negative controls, to demonstrate the potentials of this pulse in the support of growth in living organisms.
Results: The results obtained showed that the growth parameters for the groups is best for the positive control having almost the highest amount of 25.40±2.15g weight changes over the 21 days feeding period with a total mean diet of 270.40±2.22g consumed per rat within this period. Groups 3 and 4 were the comparable to these values. Group 3 gave weight changes of 27.80±4.92g, while group 4 had a value of 29.30±2.45g, with a mean diet of 274.80±3.20g and 280.20±0.60g respectively over the 21days feeding period.
Conclusions: Conclusion Potential utilisation of Bambara Groundnut to support growth abounds, especially in tackling malnutrition challenges; as observed in the work, thus signalling the ability for future research in the development of weaning formula in certain identified varieties of this pulse, due to its bioavailable amino acids and proteins, necessary to enhance cognitive growth and developments, especially in children.

PV109 / #355

COMPLEMENTARY FEEDING PRACTICES AND NUTRITIONAL OUTCOME AMONG INFANTS AGED 6-23 MONTHS IN ISHAKA-BUSHENYI MUNICIPALITY, SOUTHWESTERN UGANDA: A CROSS-SECTIONAL MULTICENTRE STUDY

MALNUTRITION

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Background and Aims: Undernutrition remains a global burden with rising numbers of wasted, stunted or concurrent wasting and stunting (WaSt) children worldwide. The study aimed to determine complementary feeding practices and factors associated with undernutrition among infants aged 6–23 months receiving care at two tertiary hospitals in Southwestern Uganda.
Methods: A total of 364 infants/caregiver pairs were enrolled by consecutive sampling. Complementary feeding was measured using WHO infant and young child feeding (IYCF) indicators. Data was analysed using both univariate and logistic regression analyses and further firth regression analysis to minimise impact of multicollinearity amongst nutritional outcomes.
Results: We found poor complementary feeding practices, with 22.5% meeting appropriate complementary feeding practices; 25.3% minimum acceptable diet; 35.4% acceptable dietary diversity; 52.5% acceptable meal frequency; and 46.2% continued breastfeeding beyond 12 months. Undernutrition prevalence was 43.4% (158/364), among whom 55.1% (87/158) were stunted, 33.5% (53/158) were wasted, and 11.4% (18/158) had WaSt. Continued breastfeeding after 1 year (AOR 1.897(95%C. I,1.007-3.576), sex (AOR 2.035(95%C. I, 1.136-3.646, for males) and poor dietary diversity (AOR 2.070(95% C.I,1.028-4.167)) were predictor of undernutrition. Further analysis showed that, higher caregiver education was less associated with stunting (AOR=0.25 (95% CI, 0.11-0.58)) and WaSt (AOR=0.11 (95% CI, 0.01-0.93)).
Conclusions: Undernutrition remains a significant burden among infants aged 6-23 months, with complementary feeding practices falling short. Notably, 1 in 10 undernourished children suffers from concurrent Wasting and Stunting. Predictors include continued breastfeeding beyond one-year, male sex, and inadequate dietary diversity. Routine WaSt reporting is crucial and an urgent need for nutritional education intensification on optimal feeding practices.

PV110 / #436

A SYSTEMATIC REVIEW TO EXAMINE THE RELATIONSHIP BETWEEN MICRONUTRIENT DEFICIENCIES ON NEURODEVELOPMENTAL OUTCOMES IN LOW-BIRTH WEIGHT (LBW) INFANTS.

MALNUTRITION

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Background and Aims: Over 20 million low-birth weight (LBW)/ preterm infants are born annually. These infants are at increased risk for developmental delays, in part linked to micronutrient malnutrition which play major functional roles in nervous system structure during first 1000 days. A systematic review was conducted to delineate the relationship between micronutrient deficiencies and neurodevelopmental outcomes in LBW/ preterm infants and synthesise management approaches.
Methods: MEDLINE, EMBASE, CINAHL, AMED, PsycINFO and CENTRAL were searched using predefined keywords related to micronutrients and neurodevelopment in children, with no language or timeline restrictions. Randomised and observational studies evaluating feeding support and/or micronutrient supplementation during the post-natal period were included. Two reviewers independently screened studies, extracted data, and assessed quality using the Cochrane Risk of Bias Tool. Data was synthesised narratively.
Results: Of 714 records screened, 12 studies met inclusion criteria, comprising 2 cohort, 9 randomized controlled, and 1 cross-sectional study. Micronutrients most frequently assessed were iron, zinc, vitamin D, B12 and B6. Suboptimal zinc status in early infancy and vitamin B12 deficiency were consistently associated with lower cognitive and motor scores. Evidence for iron and vitamin D showed mixed associations, limited by small sample sizes, heterogeneous assessment methods and limited neurodevelopment measurements. Certainty of evidence was moderate for iron and low for other micronutrients due to methodological variability and potential confounding.
Conclusions: Micronutrient malnutrition remains a significant, but modifiable risk factor for impaired neurodevelopment in preterm/ LBW infants. Harmonised efforts to produce well-designed longitudinal and interventional studies are needed to inform nutritional interventions to support neurodevelopment in this population.

PV111 / #741

VALUE OF PEDIATRIC ORAL NUTRITION SUPPLEMENT USE IN AT-RISK AND UNDERNOURISHED CHILDREN

MALNUTRITION

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Background and Aims: Pediatric oral nutrition supplements (ONS) have demonstrated benefits beyond catch-up growth to quality growth, including increased muscle mass, improved bone density, and reduced illness, in children at nutritional risk. This study models the country-level impact of adopting pediatric ONS in Vietnam
Methods: A one-year decision tree model from a societal perspective compared ONS plus dietary counselling (DC) with DC alone in children aged 2-5 years who are at risk of undernutrition. Clinical inputs on growth and illness reduction were derived from the SPROUT randomized controlled trial. Healthcare costs, illness-related resource use, and wage data were obtained from published literature and expressed in 2025 USD.
Results: An estimated 2.3 million Vietnamese children aged 2-5 years are at risk of undernutrition. Adding ONS increased recovery from stunting by 10.1 percentage points (22.7% vs 12.6%). Illness episodes decreased by 13%, or 0.3 fewer cases per child annually (705,840 total population cases). Missed school days declined by 36% (2 days per child; 4,587,960 days across the population). Caregivers missed workdays due to child illness dropped by 50.1% (0.6 days per child; 1,302,579 total), corresponding to reduced lost wages of US$8.25 per child (US$19.4 million). Healthcare expenditure decreased by US$9.64 per child (US$22.7 million).
Conclusions: Over one year, adding ONS to DC improves nutritional status while reducing illness burden and healthcare use, and lowering school absenteeism and caregiver productivity loss. These short-term gains, alongside potential long-term benefits through quality growth support incorporating ONS in child-nutrition strategies to improve child well-being and long-term societal development.

PV112 / #306

STUDY PROTOCOL AND IMPLEMENTATION PLAN OF A MATERNAL EMPOWERMENT INTERVENTION ON CHILD NUTRITIONAL, IRON AND ZINC STATUS: A CLUSTER RANDOMISED CONTROLLED TRIAL

MALNUTRITION

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Background and Aims: Chronic malnutrition, characterised by stunting and specific micronutrient deficiencies (MNDs), remains a severe impediment to child development in Indonesia. Addressing this, evidence-based interventions that target the underlying behavioural causes. This study outlines the design and implementation protocol for a Cluster Randomised Controlled Trial (cRCT) evaluating the effectiveness of a Maternal Empowerment Intervention (MEI) compared with the standard government package for pregnant women.
Methods: This cRCT will recruit 78 pregnant women in their second trimester and follow their children until 7 months of age. Six health centres will be randomised to either the intervention or control arm. The MEI is delivered by trained nutritionists over 3 months and consists of three core components: Targeted Nutrition Education, Growth and Development Monitoring, and Home Management of Childhood Illnesses. Differences in primary outcomes (haemoglobin and zinc concentrations, iron and zinc status, and prevalence of stunting, overweight/obesity, and Concurrent Stunting and Overweight/Obesity (CSO)) will be assessed using Pearson's chi-squared tests and multivariable logistic regression, accounting for the clustering design. The protocol was approved by the Faculty of Medicine and Health Sciences, University of Nottingham Research Ethics Committee (Ref: FMHS 157-0525).
Results: The primary outcomes are children's iron and zinc status, prevalence of stunting, overweight/obesity, and CSO. The secondary outcomes include maternal nutritional status, maternal iron profile, maternal nutrient intake, children's nutrient intake, and feeding practices.
Conclusions: If proven effective, this intervention provides strong, high-quality evidence for implementing a scalable and sustainable public health strategy designed to tackle both chronic undernutrition and specific micronutrient deficiencies in resource-constrained settings.

PV113 / #538

THE INTERPLAY BETWEEN THE SHIFT TOWARD A MORE PLANT-BASED DIET, MATERNAL MICRONUTRIENT STATUS, AND INFANT IMMUNE DEVELOPMENT: A PROSPECTIVE COHORT STUDY DESIGN.

MALNUTRITION

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Background and Aims: In the Netherlands, concerns are rising about maternal micronutrient status during pregnancy and lactation due to the sustainability-driven shift toward a more plant-based diet. Although this transition may offer health benefits, it may also increase risks of nutrient deficiencies (e.g., vitamin B12, iron, iodine, and EPA/DHA). This can potentially disrupt key physiological systems, including the maternal immune system, placental development, and breastmilk composition, with possible long-term implications for infant immune health. Yet, reliable data on the extent of this transition in pregnant and lactating women and its risks and opportunities are lacking. Therefore, our primary objective is to assess female diets during pregnancy and the postpartum period, and its impact on maternal micronutrient status and infant immune development.
Methods: We will perform a prospective cohort study with repeated measures and frequent biological sampling, at each trimester during pregnancy, and 1-, 2-, 4-, 5-, 6-, and 12 months postpartum.
Results: We aim to include 341 Dutch females aged 18-45 years who are <12 weeks pregnant and to follow up at least 200 women and infants in the postpartum period. Participants will fill in online questionnaires and repeated 24h food records, and collect 24h urine, feces, and breastmilk samples at home. In addition, participants will visit the study site for anthropometry measurements, hair, saliva, and blood collection.
Conclusions: With this cohort, we aim to fill in the gap and provide high-quality and representative data of pregnant and lactating women to support policymaking and safeguard maternal and infant health.

PV114 / #684

ESTABLISH ROUTINE NUTRITIONAL SCREENING IN CENTRAL PEDIATRIC HOSPITAL

MALNUTRITION

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Background and Aims: Since May 2019, systematic nutritional risk assessment within 72 hours of admission has been included in all hospital assistance by Portuguese authority. All inpatient units were covered by this program, except neonatal and pediatric intensive care units.
Methods: Program effectiveness evaluation-intervention was made by (1) the nutritional assessment coverage rate, (2) date of the initial assessment and (3) the intervention rate by level of nutritional risk.
Results: Between May 20, 2019 and March 5, 2020, there were reported 3786 clinical episodes. In this period, we applied STRONGkids (Hulst JM, 2010) to 1438 children and adolescents, 38% total clinical-episodes. This number include episodes resulting in hospital stays<24H and intensive-care units admission. Screenings were medical (703; 48.9%) and surgical (734; 51.0%). Sixty percent (863 episodes) were low risk, 480 (33.4%) as moderate and 95 (6.6%) as high nutritional risk. The proportion of episodes with high risk identified was significantly higher in medical (11.4%) than in surgical units (2.0%) ($p<0.05$) STRONGkids was applied in 1st 24h in 62.3% of episodes, fists 48h in 76.6% and 72h day of hospitalization in 86.6%. Nutritional intervention was carried out in 463 hospitalizations (32.2%); nutritional intervention was performed in 91.6% that present high risk; in 71.5% patients at moderate risk and in 3.8% of those at low risk ($p<0,001$).
Conclusions: The preliminary analysis allows us to conclude that: - it is feasible but requires ensuring better availability (personal and temporal) to carry it out; - it is possible to meet the recommended time interval for the initial assessment.

PV115 / #767

ORAL NUTRITIONAL SUPPLEMENTATION AND DIETARY COUNSELLING IMPROVES GROWTH OUTCOMES IN CHILDREN WHO ARE AT-RISK OF STUNTING OR WITH STUNTING: SECONDARY ANALYSIS OF THE SPROUT TRIAL

MALNUTRITION

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Background and Aims: Children at-risk of stunting (height-for-age z-score [HAZ] -2 to <-1) are above the stunting threshold yet are associated with higher morbidity and poorer cognition than non-stunted peers. Evidence on their response to nutritional support is limited. This SPROUT trial secondary analysis investigated whether the efficacy of oral nutritional supplementation plus dietary counselling (ONS+DC) on growth outcomes differs between at-risk and stunted children.
Methods: SPROUT is a randomized, multicenter trial in 24–60-month-old children with or at nutritional risk, assigned to ONS+DC or DC-only for 240 days. Stunting status was classified as at-risk (HAZ −2 to <−1) or stunted (HAZ <−2). Anthropometric and dual-energy X-ray absorptiometry (DXA)-assessed lean and fat mass, bone mineral content and density (BMC, BMD) outcomes were analyzed with ANCOVA, and heterogeneity across stunting subgroups was tested via a treatment×stunting status interaction.
Results: Treatment×stunting-status interactions were non-significant ($p \geq 0.10$) for all outcomes. In both at-risk and stunted subgroups, children receiving ONS+DC had greater linear growth (least-squares mean (LSM)[SE] of change at day 240, HAZ: at-risk,+0.29[0.03] vs +0.12[0.03], $p<0.0001$; stunted,+0.28[0.04] vs +0.15[0.04], $p<0.0012$), and weight recovery (WAZ: at-risk,+0.28[0.04] vs +0.06[0.04], $p<0.001$; stunted,+0.13[0.05] vs -0.12[0.05], $p<0.001$), with greater increases in lean mass, BMC and BMD, than the DC-only group. Fat-mass gain was not different between ONS+DC and DC-only in either subgroup.
Conclusions: In at-risk children, ONS+DC increased linear growth, weight recovery, lean mass, BMC and BMD, with no evidence of differential efficacy versus stunted children. At-risk children are responsive to nutrition support, and early action may help prevent progression to stunting and its consequences.

PV116 / #773

QUANTITATIVE ASSESSMENT OF THE DUAL BURDEN OF MALNUTRITION: A 12-MONTH LONGITUDINAL ANTHROPOMETRIC STUDY OF CHILDREN (4–48 MONTHS) IN URBAN SLUMS OF BENGALURU

MALNUTRITION

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Background and Aims: Bengaluru's rapid expansion to 15 million people has fostered high-density, disadvantaged neighborhoods like Ejipura, where children face a complex "dual burden" of simultaneous under- and over-nutrition. This one-year longitudinal study, conducted by Swabhimaan Trust and SNEHA, leveraged deep community roots to assess the anthropometric status of children aged 4–48 months in Rajendranagara. The study aimed to determine malnutrition prevalence against national standards, identify environmental and socio-demographic drivers across 16 blocks, and provide data-driven insights for targeted nutritional interventions.
Methods: A one-year prospective cohort study was conducted from January to December 2025. The study area was systematically divided into 16 blocks, with monthly tracking of height, weight, and BMI. Malnutrition was defined using national Indian growth reference standards: overweight was categorized as > 97th percentile, and underweight as <10th percentile.
Results: A significant dual burden of malnutrition was observed. Among boys, 24% were overweight and 29.3% were underweight; among girls, 29% were overweight and 29.53% were underweight. Spatial data indicated that blocks further from the main thoroughfare had better health outcomes, suggesting adverse effects from localized particulate pollution. Socio-demographic disparities were pronounced: Muslim children (20% of the population) represented 80% of the least-nourished cohort, a trend correlated with younger maternal age. Preliminary analysis also linked poor growth with maternal screen time.
Conclusions: The nutritional landscape is characterized by a simultaneous dual burden of malnutrition, heavily influenced by environmental pollution and socio-demographic factors. These findings mandate an urgent shift in urban planning to incorporate pollution mitigation alongside targeted, community-based nutritional interventions for highly vulnerable groups.

PV117 / #630

EFFECT OF UNBALANCED NUTRITION OVER THE CARDIAC HEALTH IN CHILDREN

MALNUTRITION

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Background and Aims: Malnutrition and unbalanced dietary esspecially with micronutrient deficiency are deeply involved not only in growth and development but also can affect cardiac structure and function.
Methods: We report a case series of children with dilated cardiomiopathy due to severe anemia secondary to dietary restriction. The cases were analyzed in detail regarding family history, personal history, clinic examination including anthropometric measuremts, laboratory test (hemoglobin, iron, ferritin, vitamina B12 , folat, s, inflammatory markers, troponin, CK-MB, NT pro-BNP), ECG (form rithm disorders and conduction defects) and echocardiography (left ventricle ejection fraction, left ventricule shortening fraction, diastolic function).
Results: We present the cases of two toddlers with severe nutritional anemia (Hg = 1g/dl and 3g/dl), low serum levels of folat and vitamin B12 who developed dilated cardiomiopathy which required treatment and closed follow with satisfactoy recovery.
Conclusions: Failure of appropriate nutrition, unbalanced or restrictive diets in children especially regarding micronutriment could have a strong impact not even on growth and development but also on cardiac structure and function.

PV118 / #611

WHEN HOME BECOMES UNSAFE: THE IMPACT OF INTERPARENTAL VIOLENCE ON ADOLESCENTS IN EDUCATIONAL–THERAPEUTIC SETTINGS

MALNUTRITION

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Background and Aims: This study examines adolescents residing in institutions of the Ministry of Welfare and
Social Services due to criminal behavior or societal deviation, focusing on the impact of exposure to interparental violence.
Methods: Using qualitative-archival research, data were coded from 605 personal files of at-risk adolescents institutionalized over two decades. Of
these, 54.7% were exposed to interparental violence, while 45.3% were not. A comparative analysis assessed differences in personality traits, self-risk behaviors, offense types, and victimization history.
Results: Findings indicate that adolescents exposed to interparental violence exhibited lower interpersonal functioning and self-image, higher
extroversion, increased suicidality, and greater involvement in unnoticed sexual behavior, substance abuse, and institutional escape. They committed more sex-, drug-, alcohol-, property-, and violence-related offenses and had higher exposure to parental inappropriate sexual behavior, abuse, and neglect, though no differences were found in experiences of sexual assault.
Conclusions: These results suggest that growing up in a violent environment fosters internalization of negative behavioral patterns, impairing
relationships and well-being. Early intervention and tailored support programs are crucial to mitigating these effects and reducing long-term harm.

PV119 / #444

SEVERE MARASMIC MALNUTRITION IN AN INSTITUTIONALIZED CHILD WITH MULTI-SYSTEM COMORBIDITIES: A CASE REPORT

MALNUTRITION

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Background and Aims: Protein-energy malnutrition remains a significant contributor to morbidity in institutionalized children. Severe marasmus leads to profound metabolic imbalance, increased infectious risk, impaired growth, and significant neurodevelopmental consequences. We present a complex case of advanced marasmic malnutrition in a school-aged child with extensive comorbidities, highlighting the diagnostic and therapeutic challenges of extreme undernutrition.
Methods: A 6-year-9-month-old male, institutionalized since birth, was evaluated for severe failure to thrive. Anthropometry revealed extreme staturo-ponderal hypotrophy (weight 5.6 kg; W –10.4 SD; H –8.4 SD), complete loss of subcutaneous fat, muscular hypotrophy, trophic skin changes, and dysmorphic features. His medical history included chronic malabsorption, chronic encephalopathy, megacolon, recurrent respiratory infections, congenital renal malformations and congenital cataracts. Clinical, laboratory, and imaging assessments were reviewed to determine multisystem involvement.
Results: Laboratory evaluation revealed microcytic hypochromic anemia, thrombocytosis, elevated inflammatory biomarkers, hyponatremia, metabolic acidosis, severe hypoglycemia, and bacteriuria with Proteus mirabilis. Renal ultrasound identified right hydronephrosis grade III and left renal hypoplasia. Screening for celiac disease, cystic fibrosis, and metabolic disorders was negative. The final diagnosis included Grade III marasmic protein-energy malnutrition, nutritional and inflammatory anemia, rickets, chronic encephalopathy, megacolon, and acute pyelonephritis. Treatment involved piperacillin–tazobactam, enteral nutritional rehabilitation via gavage, human albumin, antipyretics, dermatologic care, antireflux positioning, and UTI prophylaxis.
Conclusions: This case illustrates the severe consequences of prolonged undernutrition compounded by congenital abnormalities and recurrent infections. Early recognition, structured nutritional rehabilitation, and coordinated multidisciplinary care are essential to improving outcomes in children with extreme biological and psychosocial vulnerability.

PV120 / #18

FOOD POVERTY AND RELATED FACTORS AMONG INFANTS AND YOUNG CHILDREN LIVING IN BENIN

MALNUTRITION

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Background and Aims: This study aimed to identify the factors associated with food poverty among infants and young children living in rural areas of Benin.
Methods: Interviews were conducted with 122 mothers of infants and young children living in rural areas of Benin, and 104 mothers who had started complementary foods for their infants were analyzed. The survey questionnaire included questions on breastfeeding and type of children's food.
Results: The overall mean number of food groups in children's diets was 4.9 (±1.7), indicating a moderate level of food poverty. Of the eight food groups, grains, root vegetables, and tubers were consumed by almost all (97.1%). While meat by 89.4%, with fish accounting for the majority (83.7%), and eggs by 44.2%. Among the 104 participants analyzed, 76 mothers with children aged 0-23 months were breastfeeding, with 69.7% continuing breastfeeding. A logistic regression analysis was performed using variables such as "place of residence" and "age at breastfeeding cessation," which showed significant associations in bivariate analysis, and "mother's age," "mother's education level," "child's sex," and "child's age," which were included in previous research as explanatory variables. Severe to moderate food poverty (four or fewer food groups) and non-severe food poverty (five or more food groups) were compared as the dependent variables. The results indicated that "place of residence" and "age at breastfeeding cessation" were significantly associated with food poverty.
Conclusions: Even when biological and socioeconomic factors are considered, combining complementary foods with breastfeeding may affect food poverty level among children.

PV121 / #4

PRELIMINARY STUDY ON THE AWARENESS AND BEHAVIOR OF MOTHERS LIVING IN RURAL AREAS OF SUB-SAHARAN AFRICA REGARDING EARLY BREASTFEEDING

MALNUTRITION

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Background and Aims: In Sub-Saharan Africa, malnutrition is a major cause of infant mortality. The WHO recommends exclusive breastfeeding, stating that "if breastfeeding is initiated within one hour of birth, continued exclusively for six months, and maintained for more than two years, children can be protected from malnutrition, including wasting and obesity." This study aimed to clarify the awareness and behavior of mothers with weaning children living in rural areas of Sub-Saharan Africa regarding early breastfeeding and to serve as a preliminary investigation to address nutritional issues among children in Sub-Saharan Africa.
Methods: We conducted an interview survey with 20 mothers or caregivers of weaning infants living in rural areas of Benin regarding breastfeeding practices in the first three days after birth. The questionnaire was developed based on previous research and in consultations with local nutritionists, who collaborated on the study.
Results: Thirteen mothers (65%) breastfed their newborns within one hour of birth, and 13 (65%) caregivers administered "medicinal herbs" to their newborns during the first three days after birth. The use of medicinal herbs was primarily attributed to traditional health practices, such as "to expel meconium quickly," "to expel waste products," and "promoting faster umbilical cord healing."
Conclusions: According to the WHO report, about 80% of people in Benin use traditional medicine, complementary and alternative medicine. To promote optimal nutrition in newborns, interventions that support early breastfeeding should involve families. In addition, more detailed interview surveys are needed to gain a deeper understanding of local practices and beliefs.

PV122 / #681

RETHINKING THE PREVAILING ASSUMPTION: CAN APPETITE ASSESSMENT PREDICT RECOVERY IN CHILDREN WITH SEVERE ACUTE MALNUTRITION? EARLY FINDINGS FROM A LONGITUDINAL STUDY

MALNUTRITION

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Background and Aims: Severe acute malnutrition (SAM) remains a major cause of child mortality and morbidity in low-resource settings. Current global protocols stratify treatment decisions, outpatient vs. inpatient, primarily based on medical complications and appetite status. As nearly 90% of SAM cases lack complications, appetite assessment becomes critical. The standard "appetite test," which measures how much Ready-to-Use Therapeutic Food (RUTF) a child consumes in 30 minutes, is widely used as a proxy for appetite and recovery despite limited empirical evidence. Therefore, this study investigated the association between appetite assessment and short-term treatment outcomes.
Methods: A longitudinal observational study began in July 2025 in Ethiopia, enrolling children aged 6–59 months with SAM. Appetite was assessed using the standard appetite test and appetite test plus, which observed behavioral cues such as turning head, pushing RUTF away, arching back, and crying. Rate of acceptance was scored on a 4-point scale. The main outcome was average weight gain (g/kg/day) after one week of treatment.
Results: Preliminary results from 144 children showed that RUTF consumption alone was not significantly associated with early weight gain (p=0.72). In contrast, certain behaviors: rate of acceptance(p=0.015), turning head (β = 12.45, p < 0.001), and arching back (β = –12.22, p = 0.0016), were significantly associated with weight gain. Findings also suggest that behavioral cues during the second RUTF offering were not associated with weight gain (p = 0.58).
Conclusions: Behavioral observation and rate of acceptance (appetite test plus) during the first RUTF offering are associated with early weight gain than the standard *appetite test*.

PV123 / #296

MICRONUTRIENT INTAKE IN BRAZILIAN PICKY EATER CHILDREN

MALNUTRITION

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Background and Aims: Feeding difficulties are characterized by a transient or persistent reduction in food acceptance, which may compromise adequate micronutrient intake and lead to nutritional deficiencies as well as impairments in growth and development. The aim of this study was to assess micronutrient intake in a sample of Brazilian picky eater children.
Methods: Children whose families reported feeding difficulties were refered to the clinic. Inclusion criteria were age between 24 and 60 months and being a picky eater. All 67 children referred were screened, comprising a final convenience sample of 62. During the first visitl a single 24-hour dietary recall was collected using the three-step Multiple-Pass Method. Nutrient adequacy was assessed based on the Estimated Average Requirement and Adequate Intake values from the Dietary Reference Intakes.
Results: 62 children (median age: 3 years) participated in the study and 59.7% were male. Median values, interquartile ranges and minimum–maximum values of anthropometric indicators are presented in Table
1.

Table 1. Anthropometric data of study participants (n=62).

	Median (Q1 – Q3)	Minimum - Maximum
Weight-for-age z-score	0.09 (-0.7 – 0.8)	-2.6 – 3.8
Height-for-age z-score	-0.3 (-0.7 – 0.5)	-3.7 – 1.7
BMI-for-age z-score	0.3 (-0.4 – 1.24)	-1.9 – 4.7

The median daily intake of micronutrients is presented in Table 2. A high prevalence of inadequate intake (>60%) was observed for potassium, vitamin D, folate, and choline. Additionally, calcium, zinc, and magnesium were inadequately consumed by more than 30% of the
children.

Table 2. Daily intake of micronutrients and percentage of inadequacy (n=62).

	Median (Q1 – Q3)	Minimum - Maximum	Inadequacy (%)*
Potassium (mg/day)	1192.6 (756.5 – 1737.9)	45.4 – 3022.7	83.9
Vitamin D (µg/day)	4 (0.7 – 7.8)	0.1 – 16.9	80.6
Folate (µg/day)	83.9 (47.3 – 144.2)	6.9 – 450.9	74.2
Choline (mg/day)	177.2 (116.7 – 261.2)	3.5 – 697.5	61.3
Calcium (mg/day)	838.2 (415.6 – 1145.5)	77 – 1650.9	38.7
Zinc (mg/day)	5.1 (3 – 7.9)	0.7 – 29.4	30.6
Magnesium (mg/day)	111.6 (74.6 – 161.3)	20 – 626.6	30.6
Vitamin A (µg/day)	382.7 (239.6 – 591.4)	45.9 – 2635.9	29
Vitamin C (mg/day)	29.6 (12.5 – 85.3)	0.6 – 171.4	27.4
Iron (mg/day)	9.3 (4.2 – 13.7)	0.8 – 23.1	21
Vitamin B12 (µg/day)	2.4 (1 – 4.4)	0.1 – 7.6	19.4

* Percentage of individuals with intake below the AI or EAR values.

Conclusions: Studies present controversial results regarding nutritional status of picky eater children, and this may reflect regional and cultural aspects or may be influenced by the complexity related to the diagnosis of feeding difficulties. The present study showed that, for this sample of Brazilian children, pick eating had a significant impact on micronutrient intake, revealing a relevant nutritional risk.

PV124 / #568

DIAGNOSTIC YIELD OF ESOPHAGOGASTRODUODENOSCOPY IN ASYMPTOMATIC CHILDREN WITH IRON DEFICIENCY ANEMIA

MALNUTRITION

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Background and Aims: Data regarding the diagnostic yield of esophagogastroduodenoscopy (EGD) in children with iron deficiency anemia (IDA) who lack gastrointestinal (GI) symptoms remain limited, and current practice varies considerably between centers.
Methods: We retrospectively collected clinical and endoscopic data of all pediatric patients who underwent diagnostic EGD solely for IDA, without any supporting clinical symptoms or laboratory evidence of underlying GI disease, between 2019 and 2025. All procedures were performed at the Pediatric Gastroenterology Institute at the Dana-Dwek Children's Hospital, Tel Aviv Medical Center.
Results: A total of 93 children with IDA underwent EGD during the study period. The median age was 10.2 years (IQR 5.2–14.3), and 53% were male. Endoscopic abnormalities were detected in 76 patients (81.7%). Patients with abnormal findings were older (OR 1.20, 95% CI 1.003–1.629) and had lower weight percentiles (OR 0.96, 95% CI 0.93–1.00) with no differences between groups in albumin and CRP levels. The most frequent diagnoses included Helicobacter pylori gastritis (n=37, 48.6%) and nonspecific chronic gastritis (n=18, 23.6%). Additional rare diagnoses included seronegative celiac disease (n=3), collagenous gastritis (n=2), autoimmune gastritis (n=3) and Crohn's disease (N=1). Based on the EGD finding, further clinical evaluation was conducted in 23 patients, and targeted interventions were undertaken in 69 cases (90.7%).
Conclusions: Our findings provide real-world evidence supporting the role of routine EGD in the evaluation of asymptomatic children with IDA and may help harmonize clinical practice across pediatric gastroenterology centers.

PV125 / #397

FEEDING PRACTICE AND NUTRITIONAL CHALLENGES IN CHINESE YOUNG CHILDREN – FINDINGS IN BAMBOO (BONE AND MICROBIOME ONSET) STUDY

MALNUTRITION

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Background and Aims: Feeding practice may differ between geographies and evolves over time, which could lead to different nutritional issues. The aim of this study is to report recent findings in feeding practice and nutritional challenges in Chinese young children.
Methods: Bamboo study is an ongoing observational cohort in Tianjin, China, to investigate the role of dietary factors on bone and microbiome development. It has 2 subgroups covering 0-12m and 6-36m, respectively. In this report we focused on children under 18m. Dietary intake information was collected by questionnaire and 3 days food diary. Nutrient intakes were calculated using the Chinese Food composition database, nutrient adequacy was assessed based on Chinese Dietary Reference Intakes.
Results: In total 1380 subjects were recruited, 690 in each subgroup. We found the prevalence of early initiation of breastfeeding was 19%. The duration of exclusive breastfeeding was 2±1.2 months (Mean±SD), 58% and 15% infants were exclusively breastfed at 4m and 6m, respectively. At 12m, 58% of children were still partially breastfed. Complementary foods were introduced at 5.5±0.5 months and consumed in 75% and 99% infants at 6m and 9m, respectively. Supplements were provided to 85-95% of children of all ages. Nutrient intake inadequacies were prevalent for some micronutrients (e.g. iron, selenium, vitamins B1and E), especially under 12m. In contrast, vitamin A intake was found excessive in over 50% of children.
Conclusions: Feeding practices in Tianjin, China, needs to be improved according to WHO's guidelines. Nutrition education could promote breastfeeding, guide selection of nutritious complementary foods and help to manage vitamin A intake.

PV126 / #441

PILOT ANALYSIS OF TOTAL PHENOLIC CONTENT IN INFANT FORMULAS, HUMAN MILK AND BOVINE MILK USING A COLORIMETRIC METHOD

METABOLOMICS

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Background and Aims: Phenolic compounds are bioactive constituents with antioxidant and anti-inflammatory properties that may influence metabolic programming in early life. This pilot study aimed to quantify the total phenolic content (TPC) in commonly used milk matrices intended for infant feeding.
Methods: Ten matrices were analyzed: six infant formulas (five cow's-milk-based and one soy-based), three human milk samples, and one bovine milk sample. TPC was measured in triplicate using the Folin–Ciocalteu colorimetric method with spectrophotometric detection. Descriptive statistics (mean, standard deviation, minimum, and maximum) were reported.
Results: TPC (mg GAE/L) varied across matrices. The soy-based formula showed the highest concentration (mean 232.7; SD 5.1; range 227–237). Cow's-milk-based formulas, analyzed collectively, presented lower concentrations (mean 151.2; SD 20.6; range 113–183). Human milk, analyzed as a combined dataset, showed intermediate values (mean 170.1; SD 23.5; range 138–211). Bovine milk exhibited the lowest concentration (mean 105.0; SD 20.0; range 92–128). These findings demonstrate the feasibility of quantifying phenolics in distinct feeding matrices and highlight preliminary differences of potential nutritional
relevance.

Table 1. Total phenolic content (mg GAE/L) in infant formulas, human milk, and bovine milk (triplicate analytical measurements).

Matrix	Mean (mg GAE/L)	SD	Minimum	Maximum
Infant formula 1 (soy-based)	232.7	5.1	227	237
Infant formula 2 (cow's-milk-based)	171.7	9.1	162	180
Infant formula 3 (cow's-milk-based)	156.3	16.3	145	175
Infant formula 4 (cow's-milk-based)	139.3	23.1	113	156
Infant formula 5 (cow's-milk-based)	133.3	11.1	123	145
Infant formula 6 (cow's-milk-based)	155.3	24.1	139	183
Human milk 1	197.3	11.8	190	211
Human milk 2	159.7	11.0	149	171
Human milk 3	153.3	15.5	138	169
Bovine milk	105.0	20.0	92	128

Note: Infant formulas were polymeric preparations intended for infants aged 0–6 months. Human milk samples were mature milk (>15 days postpartum). Cow's milk is UHT (Ultra High Temperature) pasteurized milk.

Conclusions: This pilot analysis shows heterogeneity in TPC across formulas, human milk, and bovine milk. Human milk showed intermediate concentrations, whereas the soy-based formula exhibited the highest levels and bovine milk the lowest. Expansion of the analytical dataset with more human milk samples, additional formulas, and broader classes of phytochemicals is needed to better characterize bioactive exposure during early life.

PV127 / #140

COMPARISON BETWEEN EFFICACY OF HUMAN MILK FORTIFICATION USING HUMAN MILK FORTIFIER VERSUS PRETERM FORMULA: A RETROSPECTIVE SINGLE-INSTITUTIONAL EXPERIENCE

NEONATAL & PREMATURITY

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Background and Aims: This study aims to evaluate the relative efficacy of expressed breast milk (EBM) fortified using human milk fortifier (HMF) compared to commercial preterm formula (PF) on preterm and very low birth weight (VLBW) infants in a tertiary healthcare centre in Oman.
Methods: This retrospective cohort study included two cohorts of preterm (< 32 weeks gestation) or VLBW infants (birth weight < 1500 grams) treated in the NICU. Cohort one included infants who were given PF-fortified EBM between January and December 2016, and cohort two were given newly-introduced HMF-fortified EBM between November 2018 and December 2019. Analysis was performed to compare the cohorts with respect to baseline characteristics, primary outcomes, and secondary outcomes.
Results: A total of 103 neonates were included (cohort 1: n = 55, cohort 2: n = 48). There were no significant differences in the growth of the weekly length, the growth of the head circumference, or discharge growth parameters. Compared to PF, HMF was associated with significantly better weight gain velocity (g/kg/day) during the first week (P1) and second week (P2) after the start of fortification (during P1: $p = 0.009$); during P2: $p = 0.050$), lower need for other adjunctive forms of fortification ($p = 0.035$) and lower rates of NEC in premature infants or VLBW ($p = 0.018$)
Conclusions: This is likely to be the first study to analyze the relative efficacy of HMF and PF in the Middle East. The results of this study will be helpful in guiding standards of nutritional care in NICU's in Oman.

PV128 / #213

THE IMPACT OF INTRAUTERINE GROWTH RETARDATION IN BODY COMPOSITION AND FEEDING OF PRETERM-BORN CHILDREN AT SCHOOL AGE

NEONATAL & PREMATURITY

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Background and Aims: Early nutrition deficit caused by intrauterine growth retardation may impact the long-term outcome. The aim of this study is to evaluate the growth、dietary behavior, daily intake and body composition in ex-preterm infants who have reached school age.
Methods: The cross-sectional study invited ex-preterm children who were born with birth weight below 1500g between 2008-2015 and follow-up at our outpatient clinic for this study by mail. After informed consent, the caregivers of the participants were asked to record 3-5 days diet dairy and fill in a questionnaire to evaluate their knowledge and attitude of nutrition and feeding behavior of their children. All participants measured body weight (BW), body length (BL), mid-upper arm circumference (MUAC), and body composition by bioelectrical impedance analysis (Inbody S10).
Results: A total of 46 participants complete the study, and 22 of them were SGA, the other 24 were AGA. The growth assessment of BW, BL, and MUAC were not statistically significant in both groups. Underweight (BMI<3%) was noted in 7 participants in SGA group and 3 in AGA group. The participant in the SGA group have higher percentage of carbohydrate intake (54.3±6.1% vs 49.5±5.5%, p=0.028), lower daily protein intake (47.9±11.7 vs 56.8±14.7 g/day, p=0.038), more feeding problem (6 vs 8, p=0.018) and less fat free mass index (12.4±0.7 vs 12.9±0.8 kg/m2, p=0.039) compared to AGA groups.
Conclusions: The preterm-born children with SGA at birth still have higher nutritional risk at school age, including suboptimal dietary intake, more feeding problem and less fat free mass.

PV129 / #567

ARYL HYDROCARBON RECEPTOR DEFICIENCY AFFECTS MURINE INTESTINAL DEVELOPMENT AND MATURATION IN EARLY LIFE

NEONATAL & PREMATURITY

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Background and Aims: The aryl hydrocarbon receptor (AhR) is known to regulate immune responses and maintain epithelial barrier integrity, but its role during early life remains poorly defined. This study aimed to determine how AhR deficiency influences intestinal neonatal development during the suckling-to-weaning transition, a critical period marked by the shift from milk to solids.
Methods: Intestinal tissues from AhR knockout (KO) and wild-type (WT) mice were collected at postnatal days (PD)7, 14, and 28. Intestinal length, body weight, and gene expression of neonatal and adult markers were assessed by qPCR. Protein expression was evaluated by immunohistochemistry and quantified with QuPath. Crypt cells from embryonic day 19 tissue were cultured into 3D organoids, to model the suckling-to-weaning transition in vitro. Organoids were evaluated by brightfield microscopy.
Results: KO mice exhibited a transient reduction in small intestine length at PD14, which normalized by PD28, indicating a critical developmental window during which AhR-contributes to intestinal growth regulation. At PD7 gene expression analysis revealed a 2-fold downregulation of *Blimp1* and *Alpi* ($p=0.0074$; $p=0.0196$). At PD28, epithelial maturation markers *Treh, Tff3,* and *Arg2* were decreased ($p=0.0069$; $p=0.0186$; $p=0.0395$). Protein analysis imposed region- and age-specific differences between KO and WT mice. In vitro, KO-derived organoids showed impaired growth and altered morphology compared to WT.
Conclusions: AhR is essential for proper intestinal development, orchestrating region- and temporarily regulated expression of genes involved in epithelial maturation. AhR deficiency disrupts growth and differentiation during critical stages of neonatal intestinal development, highlighting its important role in establishing a healthy and functional gut in early life.

PV130 / #238

UNDERSTANDING FEEDING AND FORMULA CHANGE PATTERN IN LATE PRETERM INFANTS DURING EARLY INFANCY

NEONATAL & PREMATURITY

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Background and Aims: This study aimed to explore the factors influencing formula changes among late preterm infants during the first six months of life, with particular attention to formula selection, breastfeeding supplementation, and the use of feed thickeners. Although the infant formula market provides a wide variety of products tailored to different stages of infant development, many healthy infants still undergo unnecessary changes in formula.
Methods: Structured interviews were conducted with parents of 250 infants aged 6–18 months. Data were collected in maternal and child health centers across Abu Dhabi using a detailed questionnaire assessing feeding practices and formula usage.
Results: Almost half of the infants (40 %) experienced at least one formula change during the first six months. Among these, 61 % switched to another cow's milk–based formula. The most common reasons for changing formula were constipation (29 %), vomiting or regurgitation (21 %), and irritability (20 %). Formula changes were more frequent among infants with lower birth weight z-scores and those showing greater increases in weight (Δz2). Interestingly, healthcare professionals, including pediatricians, had minimal influence on parents' formula choices.
Conclusions: These changes were largely made without consulting healthcare professionals, emphasizing the need for better parental education and professional support in managing feeding-related concerns Most formula changes were driven by parental concerns about common infant symptoms often misinterpreted as formula intolerance.

PV131 / #434

UNDERSTANDING HEALTH PROFESSIONAL'S KNOWLEDGE, PRACTICES AND OTHER HEALTH SYSTEM DETERMINANTS RELATED TO FEEDING LOW-BIRTH WEIGHT INFANTS IN THE FIRST 12 MONTHS OF LIFE IN MALAWI.

NEONATAL & PREMATURITY

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Background and Aims: Over 20 million low birthweight (LBW) and preterm infants are born annually, over 90% in developing countries. These infants face high risks of morbidity, mortality, developmental delay, and chronic disease. Sustainable and accessible postnatal feeding support is therefore crucial. In Malawi, children often fail to reach developmental potential due to poverty and micronutrient deficiencies, yet little is known about the challenges health professionals face in feeding management of LBW infants. This qualitative study explored current practices, nutrient standards, and health system inputs influencing feeding care and survival of LBW infants in Malawi.
Methods: Fourteen key informant interviews and two focus group discussions were conducted between August–November 2025 with medical doctors, community health workers, nurses, Ministry of Health representatives, NGOs, and community leaders. The use of grounded theory and phenomenological framework guided comprehensive thematic analysis; to identify barriers and facilitators to optimal feeding, nutrient-rich diet access, and growth monitoring.
Results: Major barriers included restricted access to nutrient-rich foods secondary to poverty, unregulated 'junk food' marketing, and inadequate breastfeeding support. Health professionals cited limited training on growth monitoring and the absence of standardised national protocols. Environmental constraints included lack of supplements, limited availability of donor milk and fortifiers, and absence of safe breastfeeding spaces. Weak referral pathways hindered continuity of care from hospitals to communities.
Conclusions: Strengthening workforce capacity, standardising feeding protocols, and improving community-based support systems are vital to promote sustainable, evidence-based, culturally sensitive feeding interventions. The proposed framework will help enhance growth and neurodevelopment outcomes for Malawi's LBW infants, whilst advocating for Malawian mothers.

PV132 / #171

BETWEEN LAYERS: INTER-OBSERVER RELIABILITY AND ANATOMICAL SITE SELECTION FOR B-MODE ULTRASOUND MEASUREMENT OF SUBCUTANEOUS ADIPOSE TISSUE IN NEWBORNS

NEONATAL & PREMATURITY

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Background and Aims: B-mode Ultrasound (US) is an emerging tool for assessing regional adiposity in neonatal care. US-based evaluation of nutritional status appears feasible, yet consensus is lacking on which anatomical sites reliably represent adiposity. We aim to assess inter-observer reliability of US for measuring subcutaneous adipose tissue (SAT) across eleven anatomical sites in newborns.
Methods: Healthy preterm (>32 weeks) and term infants underwent SAT thickness measurement by two researchers using a Vscan Air™ US device, following a modified standardised SAT measurement protocol for children aged 3-6 years. Images were analysed using semi-automatic software. Inter-observer reliability – Intraclass correlation coefficient (ICC), bias%, standard error measurement (SEM), % SEM and minimal detectable change (MDC95) – are

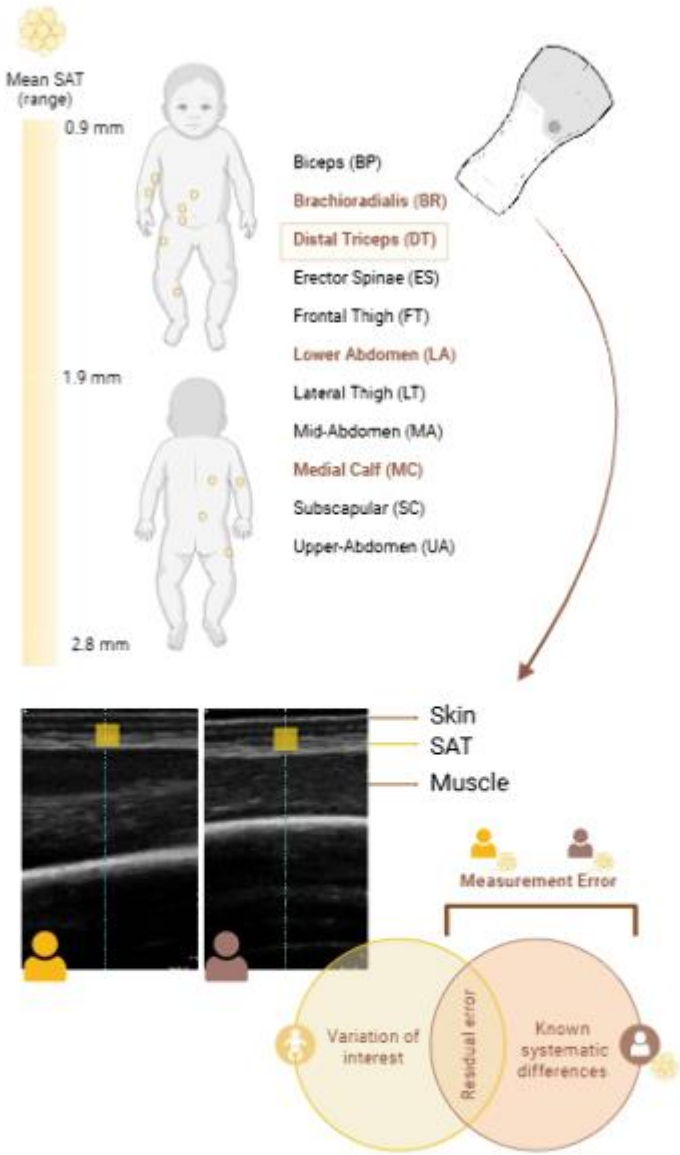

Fig. 1: B-mode ultrasound assessment of SAT at 11 anatomical sites for single-observer measurements. Schematic overview of anatomical site selection in newborns. A cross-design with two observers and two measurements per participant was used to determine inter-observer reliability — ICC (2,1). A total of 876 images (n = 40) were analysed, with SAT measured 50–300 times per observer-selected region of interest using the NISOS-BCA Fat Analysis Tool (shaded area). Venn diagram illustrating observers as a source of variation within the reliability study design. The capacity to detect true changes in SAT—representing the variation of interest—improves as measurement error decreases. Created in BioRender. Lima, R. (2025) https://BioRender.com/ys54v6k

reported.

Results: Eighteen preterm and twenty-two term infants were assessed. Median (range) gestational age and weight were 37 weeks (33-42) and 2756 g (1670 - 4115 g). Mean SAT (range) was 1.90 mm (0.95 - 2.81mm). Inter-observer reliability for single measurements at the lower abdomen, distal triceps, brachioradialis, and medial calf sites was good, with ICC(2,1) >0.7, SEM 0.38–0.55 mm (SEM% 16.7–27.2%), and MDC95 1.1–1.5 mm. Site-dependent offset, expressed as mean bias% between observers (–7.8% to 37.7%). Averaging two scores reduced MDC95 by 29.3%, enabling sub-millimetre detection change in seven sites.

Conclusions: We identified four reliable anatomical sites for single-observer SAT measurement.

Variability and low reliability among the remaining sites suggest the use of average of repeated measurements in future standardisation. Detecting small SAT changes is key to establishing the clinical utility of US-based adiposity assessment in neonates.

PV133 / #266

PROTOCOL-DRIVEN EARLY ENTERAL NUTRITION IMPROVES FEEDING EFFICIENCY AND REDUCES CENTRAL LINE DURATION IN PRETERM INFANTS

NEONATAL & PREMATURITY

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Background and Aims: Very preterm infants experience delayed progression to full enteral feeds and prolonged central venous line use, contributing to late-onset sepsis, NEC, and extended hospitalization. Evidence supports standardized feeding protocols to accelerate enteral feeding, reduce central line days, and lower infection risk in preterm neonates. Variability in bedside feeding decisions is a well-described barrier to optimal nutrition. A structured feeding algorithm, supported by PDSA cycles and real-time data feedback, was expected to standardize practice, promote faster feeding advancement, and shorten central line exposure, thereby increasing safety and efficiency. **Aim** to increase guideline compliance to ≥90% and reduce median central line duration by ≥30% within 12 months.
Methods: Methods: Level III NICU at a tertiary perinatal center. Care team included neonatologists and neonatal nurses. Intervention PDSA cycles included. **Process:** compliance with feeding guideline (%). **Balancing:** growth velocity, readmissions for feeding issues
Results: Significant improvement in feeding advancement ($p<0.01$) and central line duration ($p=0.02$), with reductions in NEC and sepsis and no increase in feeding intolerance.

Outcome	Baseline	Post	Change
Time to full feeds (days)	16.5 ± 5.6	10.8 ± 3.7	−35%
Central line duration (days)	14	9	−36%
NEC ≥ Stage II	8%	2%	−75%
Late-onset sepsis	15%	8%	−47%
Exclusive human milk	88%	97%	+9%
Length of stay (days)	54	45	−17%

Feeding intolerance did not increase. Success dependent on nursing engagement, visible data feedback, and standardized documentation.
Conclusions: Standardized feeding practice significantly improved early nutrition, enhanced patient safety, and reduced central line days. This model is scalable and sustainable across NICUs.

PV134 / #468

ULTRASOUND-BASED BEDSIDE ASSESSMENT OF GASTRIC RESIDUAL VOLUME IN PRETERM INFANTS: CREATION OF A PREDICTIVE MODEL

NEONATAL & PREMATURITY

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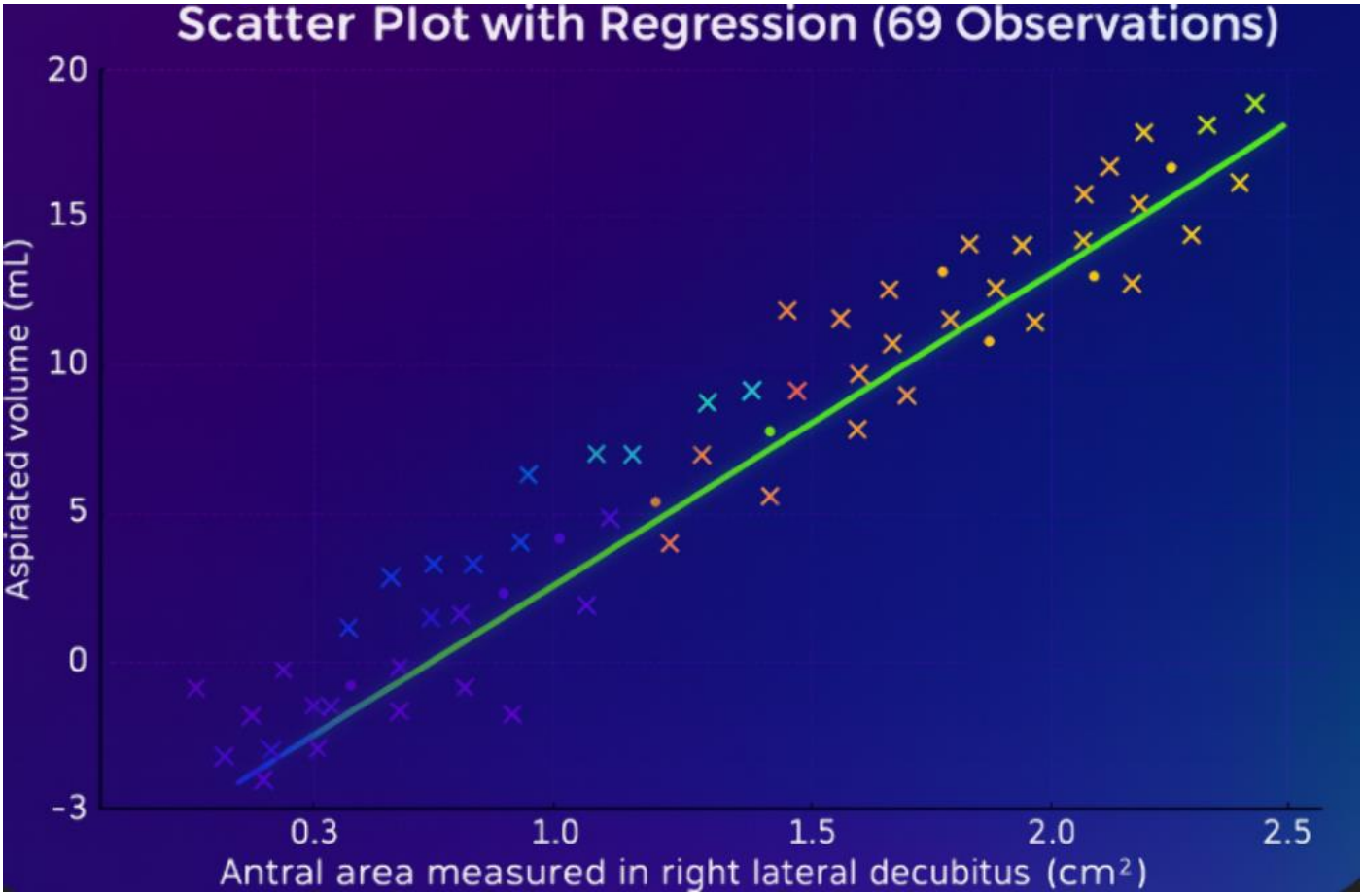
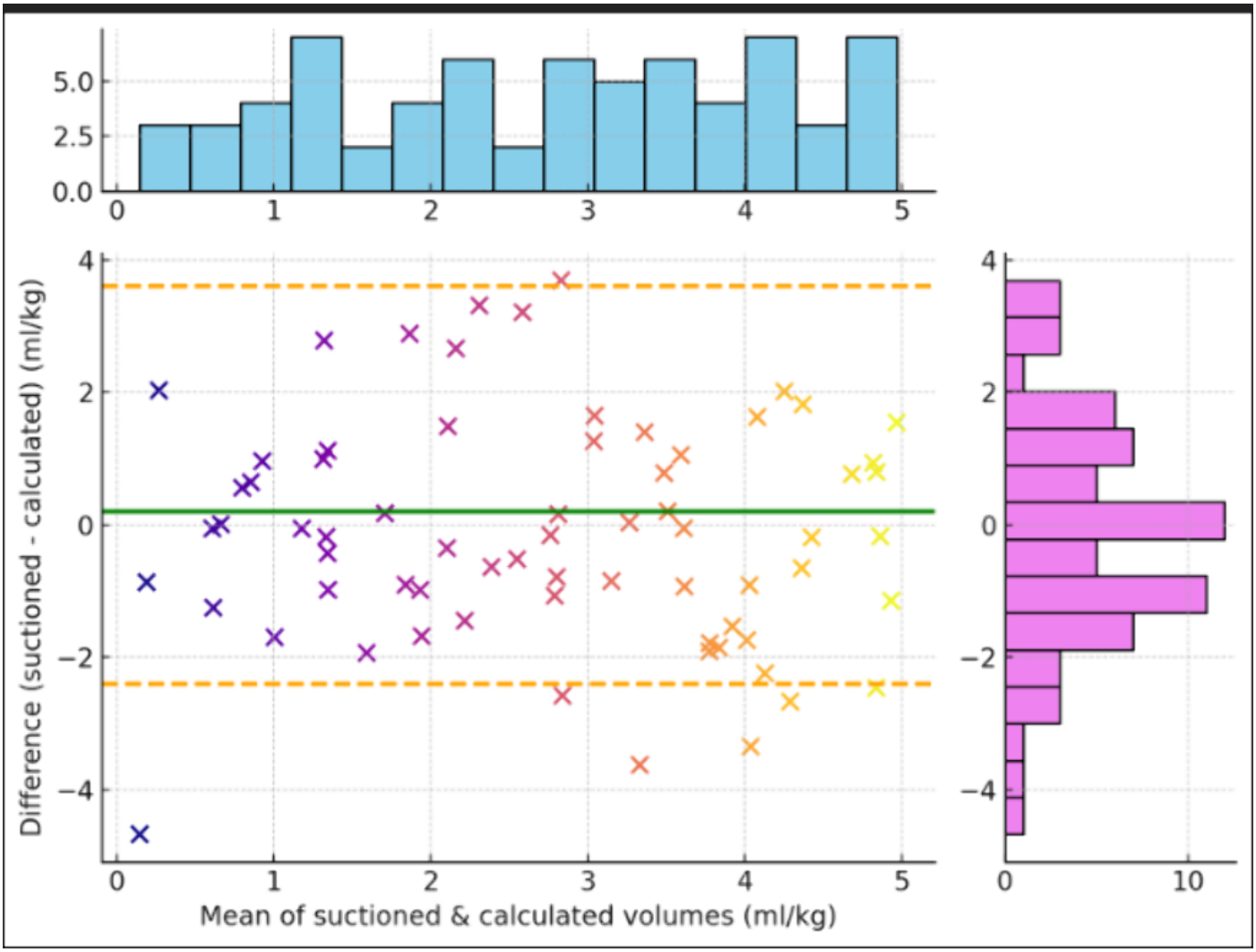
Background and Aims: This study sought to create non-invasive,ultrasound-based method for estimating gastric residual volume(GRV) in preterm neonates.Routine aspiration of gastric residuals in preterm infants can interrupt feeding,delay the achievement of full enteral intake,prolong the time to regain birth weight, and may even harm the gastric mucosa.
Methods: This observational study evaluated 63 preterm infants receiving tube feeds, collecting demographic data, ultrasound measurements of gastric antral cross-sectional area (GACSA) in the right lateral position within 15 minutes pre-feed, and residual volume (RV) via aspiration. Linear regression and Pearson correlation explored the GACSA-aspirated RV relationship. Significant variables were incorporated into a stepwise multiple regression model. Bland-Altman analysis assessed agreement between aspirated RV and ultrasound-derived volume.
Results:



A total of 89 usable infant assessments were analysed. A strong correlation was observed between right lateral GACSA and aspirated RV (P<0.001;r=0.905).A predictive equation was formulated: Volume (ml) = 8.1 ×GACSA(cm^2).
This closely aligned with findings from earlier work proposing:

Volume (ml) = –3.74 + 9.08 ×GACSA(cm^2).

Comparison of measured and model-derived RV showed a mean difference of 0.2 ml/kg, with limits of agreement ranging from –2.4 to 3.6 ml/kg.



Conclusions: This preliminary model paves the way for incorporating ultrasound-guided residual volume monitoring into neonatal care protocols.Ultrasound technology offers a promising, non-invasive approach for assessing gastric residual volume in preterm infants, mitigating the risks associated with routine aspiration and enhancing nutritional strategies

PV135 / #369

IMPACT OF EARLY PARENTERAL NUTRITION ON METABOLIC ACIDOSIS AND CLINICAL OUTCOMES IN VERY PRETERM INFANTS

NEONATAL & PREMATURITY

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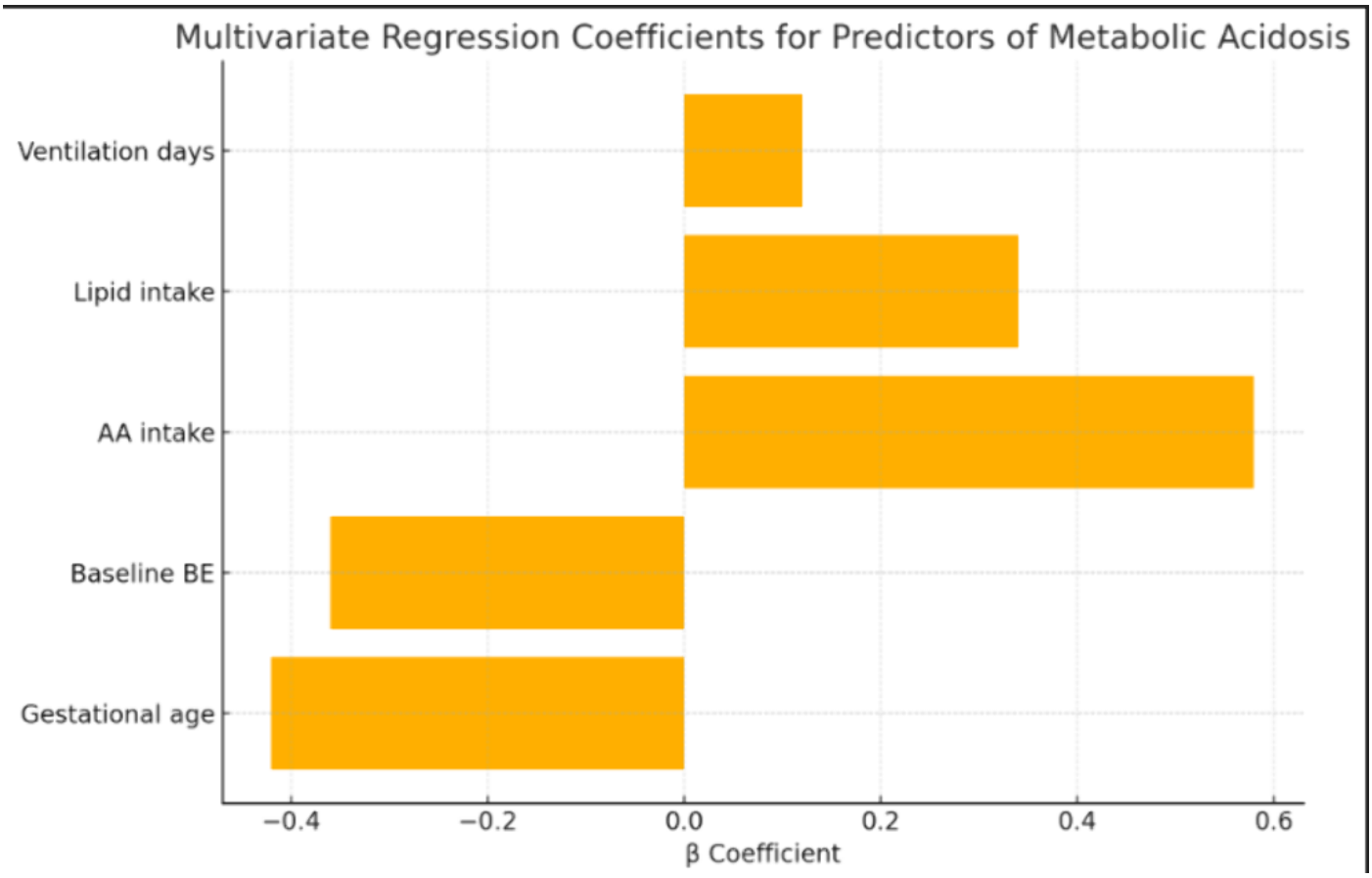
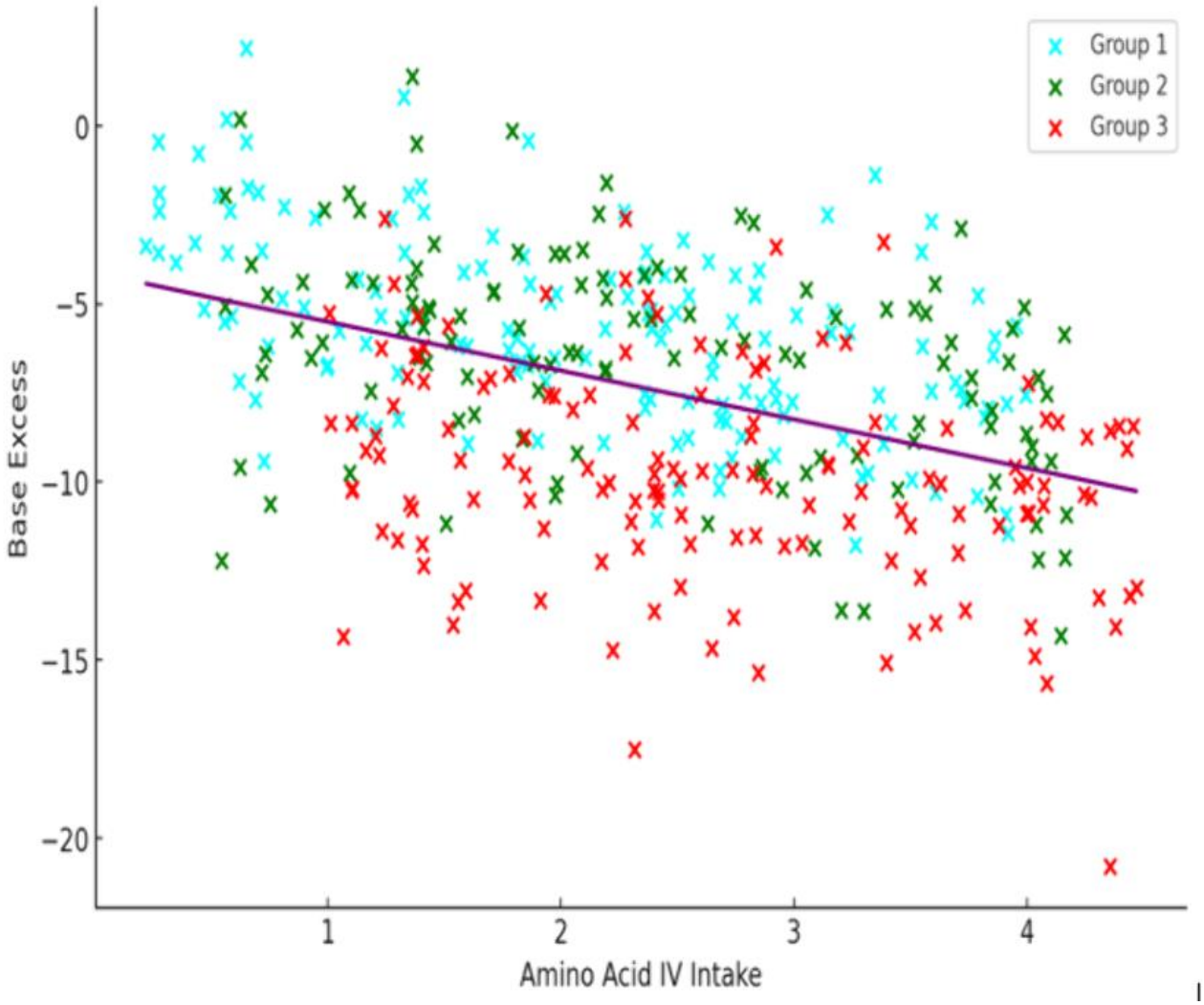
Background and Aims: Early optimized parenteral nutrition (PN), intended to deliver higher protein and energy intake from the first days of life, is widely recommended for very low birth weight and extremely preterm infants to support growth and improve clinical outcomes. However, the impact of such enhanced nutritional strategies on acid–base homeostasis remains insufficiently defined. Because very preterm infants have limited metabolic capacity and immature renal buffering mechanisms, higher early amino acid and lipid intake may increase the risk of metabolic acidosis. This study aimed to examine the relationship between early PN-derived nutrient intake and acid–base balance in these infants

Methods: this observational study was conducted among infants ≤28 weeks' gestation who received PN during first postnatal week. Neonates were categorized into three groups based on progressively increasing amino acid and lipid intake.Daily nutritional data were correlated with serial measurements of pH,base excess,lactate,with acidosis defined according to base excess thresholds. A total of eighty-one infants contributed four hundred eighty-two nutritional records and three hundred twenty-five blood gas analyses

Results:





Multiple Linear Regression for Base Excess (R^2 = 0.41)

Variable	Coefficient	R^2 partial	t	P
Amino Acid IV Intake (g/kg/day)	-0.78	-0.14	-3.6	0.0004
Lipid IV Intake (g/kg/day)	-0.92	-0.18	-5.2	<0.0001
Gestational Age (weeks)	0.96	0.38	10.8	<0.0001
Initial BE	0.25	0.21	6.1	<0.0001
Variables not included in the final model				
Differential Na–Cl Intake				
Carbohydrate IV Intake				
Day of Life				

Protein and lipid intake differed significantly among the groups, Group 3 receiving the highest. Metabolic acidosis severity increased in higher nutrient load. Gestational age, baseline base excess, and early amino acid and lipid intake were identified as independent predictors of acid–base status.

Conclusions: Higher early PN intake was associated with more pronounced metabolic acidosis,

longer duration of ventilation, shorter hospitalization, and improved survival. These findings emphasize the need for careful metabolic monitoring and individualized PN strategies to balance nutritional goals with metabolic tolerance in very preterm infants

PV136 / #303

HUMAN MILK MACRONUTRIENT COMPOSITION AND INTAKE IN RELATION TO THE GROWTH OF PRETERM INFANTS: A COHORT STUDY

NEONATAL & PREMATURITY

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Background and Aims: Understanding the impact of each macronutrient in human milk on the growth of preterm infants is essential. This study was conducted to examine the associations between human milk macronutrients and preterm infant growth, with the goal of supporting fundamental knowledge for human milk fortification in this population.
Methods: We conducted a prospective and retrospective cohort study. The participants were infants born at a gestational age of ≤ 34 weeks. Human milk samples were collected weekly for up to four weeks or until discharge, whichever occurred first. The clinical outcomes were recorded. Macronutrient compositions were analyzed using the mid-infrared human milk analyzer (HMA). The associations were determined using a linear regression model.
Results: Of the 121 preterm infants, 65 (51.2%) were males. A total of 200 samples were analyzed. Fat composition showed a significant positive association with weight gain velocity, with an adjusted unstandardized coefficient (aB) of 3.07 (95% CI: 0.22 to 5.93). Total protein and fat intakes were positively associated with weight gain (aB: 3.41; 95% CI: 0.83 to 5.98 and 7.07; 95% CI: 1.73 to 12.42, respectively). Compared with the reference-based calculation, protein intake was lower and carbohydrate intake was higher throughout the 4-week period when using the HMA-based calculation.
Conclusions: Higher protein and fat intakes could potentially enhance weight gain in preterm infants. These findings provide further evidence supporting the concept of individualized human milk fortification. Our findings underscore the importance of using HMA-based methods for calculating macronutrient intake for preterm infants.

PV137 / #518

IMPACT OF CONTINUOUS HEPARIN INFUSION ON PICC-RELATED COMPLICATIONS IN NEONATES: AN 18-MONTH RETROSPECTIVE STUDY

NEONATAL & PREMATURITY

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Background and Aims: Peripherally Inserted Central Catheters (PICCs) are commonly used in Neonatal Intensive Care Units (NICUs) for long-term medication and nutrition delivery. However, PICCs are associated with complications such as infection, thrombocytopenia, intracerebral hemorrhage (IVH), occlusion, and leakage. Heparin infusion is used to maintain catheter patency, but its effectiveness and safety in neonates remain debated. To evaluate the effect of continuous heparin infusion on PICC-related complications in neonates, including infection-related removals, thrombocytopenia, IVH, occlusion, and catheter leakage.
Methods: This 18-month retrospective study (January 2024–July 2025) reviewed 561 neonatal PICC lines, comparing a pre-heparin group (n=274) to a post-heparin group (n=287). Outcomes were analyzed using adjusted multivariate logistic regression, with rates standardized per 1000 catheter-days.
Results: Infection-related removal: Significantly reduced in the heparin group (OR: 0.53; 95% CI: 0.32–0.89; *p*=0.01), with infection rates decreasing from 4.99 to 1.71 per 1000 catheter-days. **Thrombocytopenia**: Also significantly lower (OR: 0.38; 95% CI: 0.16–0.89; *p*=0.02). **Intracerebral Hemorrhage (IVH)**: No significant difference observed (OR: 0.89; 95% CI: 0.38–2.1; *p*=0.78). **Catheter occlusion (blockage)**: Showed a non-significant trend towards reduction (OR: 0.58; 95% CI: 0.29–1.14; *p*=0.11), with occlusion rates declining from 2.06 to 0.85 per 1000 catheter-days. **Catheter leakage**: No statistically significant difference noted (OR: 0.80; *p*=0.54).
Conclusions: Heparin infusion in neonatal PICC care significantly reduced infection-related removals and thrombocytopenia. It showed a non-significant trend toward fewer occlusions, with no impact on IVH or leakage. Overall, heparin may be used cautiously based on clinical judgment, with further research needed to clarify its effect on occlusion rates.

PV138 / #309

EFFICACY AND SAFETY OF A NEW GUIDELINE ON PREVENTION OF METABOLIC BONE DISEASE OF PREMATURITY

NEONATAL & PREMATURITY

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Background and Aims: Preterm infants are at risk of developing metabolic bone disease of prematurity (MBDP), characterised by the undermineralisation of a preterm infant's skeleton. Previous screening in Cork University Maternity Hospital (CUMH) measured serum alkaline phosphatase (ALP), vitamin D, calcium and phosphate with management predominantly focused on phosphate supplementation. Current evidence suggests phosphate supplementation alone may reduce serum-ionized calcium, leading to secondary hyperparathyroidism and worsening MBDP. Parathyroid hormone (PTH) is more sensitive marker of calcium deficiency than serum calcium levels. In September 2023, we introduced new guideline for prevention of MBDP, including measuring PTH. We aimed to evaluate whether the addition of PTH measurement improved management of calcium or phosphate deficiencies and assess safety of new calcium treatment.
Methods: Infants <32 weeks and/or <1.5kg born in CUMH between September 2023 to March 2024, were screened and treated for MBDP according to guideline. Outcomes compared to similar cohort born in CUMH in the previous six months
Results: •39% infants in post-guideline group had elevated PTH levels (>66ng/L). •Calcium supplementation discontinued for one infant with blood gas ionized calcium level > 1.45mmol/L. •27% infants in pre-guideline group had hypophosphatemia (< 1.8mmol/l), commenced phosphate for average of 39 days. In contrast, 15% infants in post-guideline group with hypophosphatemia commenced both phosphate and calcium for average of 23 days, representing 41% reduction in duration of treatment ($p<0.05$).
Conclusions: PTH screening revealed high incidence of hyperparathyroidism, calcium supplementation proved to be safe, with no significant hypercalcemia. Concurrent phosphate and calcium supplementation markedly reduced treatment duration, indicating improvement in management of MBDP.

PV139 / #13

DETERMINANTS OF TIMING OF BREASTFEEDING INITIATION AMONG MOTHERS DELIVERING AT PUMWANI MATERNITY HOSPITAL, NAIROBI, KENYA

NEONATAL & PREMATURITY

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Background and Aims: In 2014, approximately 62% of children were breastfed within the first hour of birth, with 60.8% in Nairobi County, against the 2030 collective target of at least 70%. This study assesses the determinants that hinder timely breastfeeding initiation among mothers delivering at Pumwani Maternity Hospital in Kenya.
Methods: This hospital-based cross-sectional study recruited 363 postnatal women within 24 hours of delivery. The chi-square and Fisher's exact tests were applied to test for association between the grouping variables and the timing of breastfeeding initiation. All significant factors were fitted in unadjusted binary models, and those that were significant were included in the multiple logistic regression models.
Results: Overall, 201 (58.4%) mothers initiated lactation within the first hour of birth. Significantly increased odds of association of breastfeeding initiation after the first hour of birth were observed among mothers who gave birth to underweight babies compared to those weighing at least 2.5kg (aOR= 3.25, 95% CI: 1.39 – 7.79, p=0.0070), those who delivered through cesarean section compared to normal delivery (aOR=8.34, 95% CI: 4.75-15.1, p <0.001), and mothers with prior knowledge on the importance of timely breastfeeding initiation compared to those who did not know (aOR=1.93, 95% CI: 1.15 – 3.24, p=0.0128).
Conclusions: Pumwani Maternity Hospital and the County government of Nairobi need to conduct periodic training for all healthcare workers to strengthen adherence to the Baby Friendly Hospital Initiative. Further research is required to generate additional evidence that can improve breastfeeding practices.

PV140 / #762

NEONATAL ZINC DEFICIENCY: A LITERATURE REVIEW

NEONATAL & PREMATURITY

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Background and Aims: Zinc is a vital micronutrient involved in over 300 enzymatic processes essential for growth and immune function. Neonates, especially preterm infants, face a high risk of deficiency due to limited stores and high metabolic demands. If untreated, this condition leads to severe systemic manifestations and long-term complications. This review aims to synthesize current evidence on neonatal zinc deficiency, highlighting its clinical relevance. By systematizing available data, the study seeks to improve early identification, promote effective prevention strategies, and encourage timely treatment to mitigate risks and improve the quality of life in this vulnerable population.
Methods: This narrative review analyzed 132 sources from databases like PubMed and Scopus, focusing on neonatal zinc deficiency. Selection prioritized clinical trials, systematic reviews, and guidelines in English and Spanish. Due to limited neonatal data, pediatric and animal models were included to ensure a comprehensive pathophysiological analysis.
Results: The analysis confirms that preterm and low-birth-weight infants are the highest-risk group, where zinc deficiency significantly increases vulnerability to sepsis, bronchopulmonary dysplasia, and retinopathy of prematurity. Clinical evidence supports a therapeutic range of 1–3 mg/kg/day for confirmed cases; however, a critical lack of unified international guidelines persists. These findings underscore the urgent need for standardized protocols and large-scale clinical trials to optimize nutritional requirements and reduce the high morbidity and mortality associated with this vulnerable neonatal population.
Conclusions: Neonatal zinc deficiency severely impairs development and immunity. Despite clinical relevance and 1–3 mg/kg/day protocols, standardized guidelines are lacking. Prioritizing active nutritional surveillance and controlled research is essential to improve perinatal outcomes.

PV141 / #368

CUE- BASED FEEDING FOR ESTABLISHMENT OF FEEDING IN LOW BIRTH WEIGHT, PRETERM BABIES

NEONATAL & PREMATURITY

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Background and Aims: Establishment of feeds in NICU is a major challenge. Aim is to compare cue-based feeding compared to NICU protocol based feeding of low birth weight preterm infants (<34 weeks, <1.5 Kg), regarding transition to oral feeds, weight gain, and length of stay.
Methods: This was a prospective case-control study conducted over 2 years in a tertiary care hospital of eastern India. Feeding establishment and weight gain outcomes were compared between neonates on protocol-based vs cue-based feeds. The groups were subdivided based on birth weight..
Results: The study group included 145 low birth weight, preterm infants <34 weeks of gestation. 73 babies were fed by protocol-based feeding and 72 neonates were fed by cue-based feeding [Infant-Driven Feeding Scales © (IDFS©) were developed by Ludwig &Waitzman (2007; 2014)] . The groups were sub-analyzed by birth weight categories: <1,500 g and 1,500–2,500 g. Study groups were comparable on baseline characteristics and neonatal morbidities. Infants fed by cue-based feeding achieved full oral feeding faster ($p = 0.035$ in birth weight 1.5 kg- 2 Kg, $p = 0.003$ in birth weight < 1.5 kg). Statistical analysis was based on the Mann-Whitney U test. Episodes of respiratory instability requiring CPAP support or invasive ventilation were less in the cue- based feeding group ($p<0.005$). Discharge weight, breastfeeding rates, and length of stay were comparable between the groups.
Conclusions: Cue-based feeding results in faster transition to full oral feeding in very low birth weight preterm infants.

PV142 / #118

SOCIO-DEMOGRAPHIC AND OBSTETRIC CHARACTERISTICS OF ADVANCED MATERNAL AGE IN ABU DHABI, UNITED ARAB EMIRATES

NEONATAL & PREMATURITY

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Background and Aims: The ongoing debate in the literature about delaying marriage and the concomitant delay in childbearing necessitates tackling advanced maternal age (AMA) issues and giving comprehensive solutions to such problems. This study aims to better understand AMA and its impact on maternal and perinatal health by investigating the prevalence, sociodemographic profiles and adverse pregnancy outcomes of AMAi n Abu Dhabi, UAE.
Methods: This study is a part of a large multicenter cross-sectional study. The project aimed to improve maternal and early child health in Abu Dhabi, UAE. It was conducted at seven healthcare centers located in the urban, suburban and rural areas of Abu Dhabi. The project's data included all mothers (i.e. Emirati and non-Emiratimothers) who came to the centers looking for healthcare follow-up.
Results: From the total of 1,710 enrolled mothers with complete data, 379 were with AMA, having a prevalence of 22.2% (95% confidence interval [CI] = 20.2, 24.2). Among 379 advanced maternal age (AMA) mothers, 328(84.5%), and 51(15.5) mothers were between 35 and 39 years, and =40 years, respectively. The mean (SD) of maternal age was 30.0(5.2) years. No significant association was found between AMA, and parent's education, family income, child gender, preterm birth and low birth weight.
In multivariable logistic regression analysis, factors significantly associated with AMA were higher parity , non-Arab mothers , maternal employment, cesarean delivery, prepregnancy maternal overweight and obesity.
Conclusions: This study underscores the need for targeted counseling, risk awareness, and policy strategies for AMA mothers, while recommending further research on AMA's social determinants in the UAE.

PV143 / #754

AN INNOVATIVE FEEDING SUPPORT PACKAGE FOR SMALL VULNERABLE INFANTS TO IMPROVE NUTRITIONAL AND HEALTH OUTCOMES: FINDINGS FROM ADAPTIVE IMPLEMENTATION RESEARCH IN INDIA, MALAWI AND TANZANIA

NEONATAL & PREMATURITY

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Background and Aims: Small vulnerable newborns (SVNs) – infants born too soon and/or too small – have increased risk for illness, growth deficits and feeding difficulties. Strengthened lactation/feeding counseling is required to facilitate breast milk feeding and family-centered care. The Low Birthweight (LBW) and Preterm Infant Feeding Trial and Supportive Care Package (LIFT-UP) study aimed to evaluate the impact, feasibility and acceptability of an innovative feeding support package plus (FSP+) to mothers of SVNs.
Methods: A one-year adaptive implementation science study was conducted in five hospitals in India, Malawi, and Tanzania. Healthcare providers were trained to deliver lactation/feeding counseling sessions on 12 milestones to mothers of SVNs at delivery, after NICU admission, and daily through discharge. Three implementation models were evaluated and adapted based on thematic analysis of 119 qualitative in-depth interviews, and matched analysis of three quantitative snapshots (80 infants each compared to baseline).
Results: After 12 months of implementation, we observed breast milk feeding that was started earlier and provided to more infants. The following outcomes improved significantly among others: infants put to the breast within one hour of life (13% to 61%), infant receiving mother's own milk (55% to 87%), mothers ever expressing breast milk (30% to 71%), and infants provided skin-to-skin care (30% to 47%). Mothers were positive about the package. Providers emphasized mentorship and training as facilitators and cited workload, documentation, and time as barriers.
Conclusions: The FSP+ can improve the initiation and maintenance of breast milk feeding for more than 26 million SVNs from birth through facility discharge.

PV144 / #390

TEMPORAL DYNAMICS OF BREAST MILK AND GUT MICROBIOTA AND THEIR MECHANISTIC LINKS TO GROWTH AND NUTRIENT INTAKE IN A PRETERM INFANT COHORT

NEONATAL & PREMATURITY

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Background and Aims: The rapid development of the gut microbiota in preterm infants is a critical determinant of their short- and long-term health. This study aimed to characterize the temporal dynamics of breast milk (BM) and gut microbiota and assess their relationships with growth and nutrient intake in preterm infants.
Methods: Serial maternal BM and fecal samples from preterm infants, GA ≤ 32 weeks, were analyzed using full-length 16S rRNA PacBio sequencing (99% genus- and 97% species-level classification). Associations with growth and nutrient intake were examined using Spearman's correlation.
Results: Of 62 preterm infants (GA 28.9±2.2 weeks, BW 1,168±370 g, 48 AGA and 14 SGA), distinct profiles were observed, with BM microbiota dominated by *Staphylococcus*. Infant gut microbiota exhibited a clear age-related succession, shifting from *Klebsiella* toward *Bifidobacterium*, with *B. breve* significantly increasing from Month (M)1 through M12. SGA infants showed higher abundances of *B. dentium* and *Lactobacillus gasseri* at M2, *B. bifidum* at M6, and *Eubacterium limosum* at M12. Growth failure at discharge was linked to lower *B. longum* at M6 and lower *Bifidobacterium* and *Akkermansia* at M12 compared to normal growth. *B. adolescentis*, *Bacteroides ovatus*, *Collinsella aerofaciens*, and *E. limosum* were positively associated with protein intake, while *K. pneumoniae* and *S. aureus* were negatively associated.

Gut microbiota profiles by months

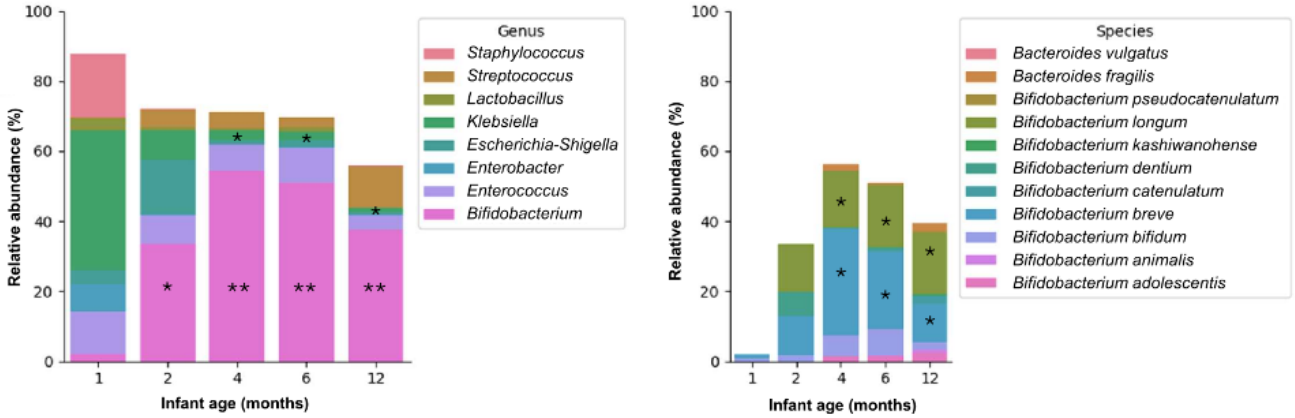

Figure 1 Temporal dynamics of gut microbiota abundance in preterm infants over 12 months, visualized at genus and species levels.
*p < 0.05 and **p < 0.001 compared to Month 1.

Gut microbiota differences between AGA and SGA

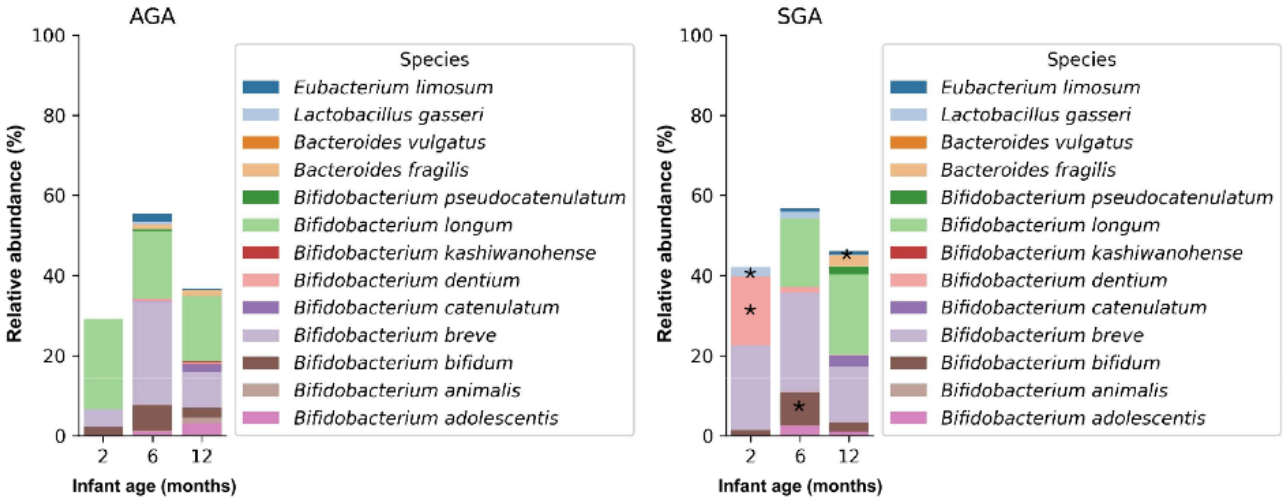

Figure 2 Differential relative abundance of key bacterial species between appropriate for gestational age (AGA) and small for gestational age (SGA) preterm infants at Month 2, Month 6, and Month 12.
*p < 0.05 compared to AGA.

Conclusions: These findings highlight early dominance of BM-derived *Staphylococcus* and significant temporal microbial succession in the preterm gut, with distinct SGA-associated signatures. Post-discharge growth failure was more strongly linked to long-term depletion of beneficial taxa than to initial SGA status. Microbiota-protein intake correlations suggest microbiota-mediated mechanisms underlying nutrient-growth relationships.

PV145 / #627

NOURISHING THE FUTURE: EARLY ANTI-INFLAMMATORY NUTRITION AS A STRATEGY TO PREVENT MILLENNIAL OBESITY

OBESITY

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Background and Aims: Obesity has become a true pandemic of the new millennium, with a significant rise already evident in childhood. Growing evidence indicates that the roots of low-grade chronic inflammation—an underlying feature of obesity—may originate in the neonatal period through suboptimal nutritional and environmental exposures. Early introduction of highly processed foods, excessive intake of sugars and saturated fats, and the vulnerability of an immature microbiota contribute to the development of pro-inflammatory metabolic pathways.
Methods: A narrative review of scientific literature from the last 10 years, focusing on:
• The impact of neonatal and early-life nutrition on long-term obesity risk
• Breastfeeding, complementary feeding timing and the quality of introduced foods
• The role of fiber, omega-3 fatty acids, polyphenols and fermented foods in microbiota modulation
• Pro-inflammatory effects of refined sugars, poor-quality fats and ultra-processed foods
• Mechanisms of metabolic programming and the microbiota–inflammation axis
Results: The literature consistently shows that anti-inflammatory nutritional choices during the first months of life promote a balanced microbiota, optimal immune function and improved metabolic regulation. Such strategies are associated with reduced inflammatory markers, lower risk of accelerated weight gain, and better cardiometabolic profiles in childhood. Conversely, early exposure to pro-inflammatory dietary patterns increases the likelihood of obesity, insulin resistance and metabolic dysfunction later in life.
Conclusions: Anti-inflammatory nutrition represents a biologically plausible and evidence-supported strategy for mitigating LGCI and its downstream health consequences. Integrating these nutritional principles into preventive health models and individualized clinical interventions may contribute to reducing the burden of inflammation-related disorders and promoting sustained long-term health.

PV146 / #628

DIGITAL LIFESTYLES AND MODERN OBESITY: UNDERSTANDING THE IMPACT OF TECHNOLOGY ON HEALTH

OBESITY

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Background and Aims: The rapid expansion of digital technologies has transformed daily life and health behaviors,particularly among children.Increased screen exposure,reduced physical activity,irregular eating patterns and constant digital stimulation create a lifestyle environment that promotes weight gain and metabolic dysregulation.Emerging evidence indicates that excessive use of smartphones,video games and social media is associated with poor sleep quality, mindless eating and heightened stress responses—factors that collectively contribute to the rising prevalence of modern obesity

Methods: A narrative review of scientific literature from the last decade, focusing on:

- The impact of screen time on physical activity, sleep and appetite regulation
- Digital overstimulation, stress pathways and emotional eating
- The role of food advertising and social media exposure on dietary choices
- Sedentary digital habits in childhood and adolescence
- Preventive strategies: digital hygiene, parental education and tech-assisted wellness tools

Results: Evidence shows that high screen time is associated with increased caloric intake, disrupted circadian rhythms and reduced energy expenditure. Exposure to digital food marketing and algorithm-driven content reinforces unhealthy eating behaviors, especially in younger populations. Conversely, structured digital interventions—such as activity-tracking devices, mindfulness apps and targeted educational programs—demonstrate potential in supporting healthier routines and reducing obesity risk when used appropriately.

Conclusions: Technology plays a dual role in modern obesity: while digital lifestyles contribute significantly to sedentary behavior, dysregulated eating patterns and metabolic imbalance, well-designed digital tools can also support prevention and behavioral change. Integrating digital education, screen-time management and evidence-based health technologies into public health strategies may help counteract the obesogenic effects of the modern digital environment.

PV147 / #245

SYSTEMATIC REVIEW OF ENERGY EXPENDITURE IN DUCHENNE MUSCULAR DYSTROPHY

OBESITY

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Background and Aims: The underlying aetiology of excess weight gain in individuals with Duchenne Muscular Dystrophy (DMD) is not well understood. Low energy expenditure may be one contributing factor. We reviewed literature directly measuring resting energy expenditure (REE) and total energy expenditure (TEE) in DMD.
Methods: A systematic search following PRISMA 2020 was conducted in MEDLINE, CINAHL, Scopus, and Embase. Eligible studies reported measured REE and TEE via established reference methods (indirect calorimetry and doubly labelled water, respectively).
Results: Fourteen studies were identified. All studies measured REE, and one of the 14 studies also measured TEE. Altogether, 487 individuals with DMD were included, of whom 147 (30.2%) were ambulant, and only 127 (26.1%) received corticosteroids. In studies (4/14 studies) that included healthy controls, absolute REE was lower in individuals with DMD (by 2.5% to 38.5%) compared with healthy controls. When normalized to fat-free mass, REE was frequently elevated (5.9% to 59.4% higher than controls). TEE for individuals with DMD was 1779 ± 260 kcal/day in one study (without healthy controls in the study) which is lower than typical values reported for healthy boys of similar age.
Conclusions: This systematic review identified variable deficits of absolute REE in DMD and variable degree of elevation of REE relative to fat-free mass. Only approximately a quarter of individuals with DMD in the included studies were treated with corticosteroid. As corticosteroid therapy is now standard of care in DMD, larger studies reporting energy expenditure with corticosteroid and contemporary treatment is now needed.

PV148 / #295

NON-INVASIVE STRATIFICATION OF METABOLIC DYSFUNCTION-ASSOCIATED STEATOTIC LIVER DISEASE AND SIGNIFICANT FIBROSIS IN ADOLESCENTS

OBESITY

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Background and Aims: Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD) is the most common chronic liver disease in pediatric populations, affecting up to 38% of children with obesity. Early identification of significant fibrosis (F ≥2) is vital to mitigate disease progression. We aimed to assess the prevalence of hepatic steatosis and fibrosis using Vibration Controlled Transient Elastography (VCTE) and its relationship with the degree of weight excess in a large cohort of 1129 adolescents aged 12 to 14 years.
Methods: This descriptive cross-sectional study assessed hepatic steatosis grades (S0 to S3) and fibrosis grades (F0 to F3) using VCTE (FibroScan). These classifications were correlated with Body Mass Index (BMI) percentiles and z-scores.
Results: A total of 68 participants displayed steatosis, and 16 presented with significant fibrosis (F≥2). Mean BMI was significantly higher in patients with steatosis (S0: 19.82; S3: 29.5) ($p<0.001$). The BMI percentile was consistently > **P99 across all steatosis grades(S1 to S3) .** Further analysis showed that a CAP threshold of ≥225 dB/m, indicating hepatic fat risk, correlated strongly with an extremely high median BMI z-score percentile of **99**, compared to subjects with low liver adiposity (CAP <225 dB/m) who had a median BMI percentile of **67–69**.
Conclusions: MASLD and significant hepatic fibrosis are present in a relevant proportion of adolescents, showing a strong association with severe obesity. The presence of **severe obesity (BMI P99)** is identified as the predominant factor driving steatosis and fibrosis. VCTE is a suitable, cost-effective screening tool for non-invasive risk stratification in this pediatric population.

PV149 / #302

BRIDGING PREDICTIVE ANALYTICS AND DIGITAL CAREGIVER COMMUNICATION: A SYSTEMATIC REVIEW ON DATA-DRIVEN APPROACHES FOR EARLY CHILDHOOD OBESITY PREVENTION

OBESITY

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Background and Aims: Early-life factors within the first 1,000 days are critical determinants of lifelong obesity risk. Predictive analytics and digital health technologies have shown potential to identify early risk trajectories, yet their integration into caregiver communication remains fragmented. Predictive models use clinical and demographic data to generate personalized obesity risk scores, providing opportunities to intervene years before diagnosis. However, these insights rarely reach caregivers in understandable, actionable ways. This systematic review examines how predictive analytics and digital communication tools have been applied in early obesity prevention and identifies opportunities to bridge data-driven research and caregiver-centered intervention.
Methods: A systematic review (2013–2025) following PRISMA guidelines analyzed studies from PubMed, Scopus, and Web of Science on early-life populations (birth–5 years) using predictive data or caregiver-focused digital health education. Data were extracted on study design, analytic methods, behavioral frameworks, communication strategies, and health outcomes.
Results: Preliminary findings indicate growing use of machine learning and electronic health records to predict obesity risk during infancy using anthropometric and sociodemographic data. However, few studies integrated predictive tools with caregiver communication platforms. Digital interventions grounded in behavioral theories have improved feeding practices and caregiver self-efficacy but had limited long-term follow-up. This reveals a structural gap between evidence generation and its translation into public health action.
Conclusions: This review highlights a paradigm shift opportunity: Predictive analytics can inform early obesity prevention, but their impact depends on how effectively insights are communicated. Integrating data science with health communication theory can transform predictive insights into actionable, family-centered interventions.

PV150 / #774

ULTRA-PROCESSED FOODS IN EARLY LIFE: IMPLICATIONS FOR CHILD GROWTH, OBESITY, AND CARDIOMETABOLIC HEALTH

OBESITY

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Background and Aims: Ultra-processed foods (UPFs), as defined by the NOVA classification system, have become increasingly common in the diets of infants and children worldwide. These foods are typically high in added sugars, unhealthy fats, salt, and food additives, while being low in dietary fiber and essential micronutrients. This review aims to summarize current evidence on the associations between UPF consumption and growth, obesity, cardiometabolic risk factors, and micronutrient deficiencies in infants and children.
Methods: Observational, cross-sectional, cohort, and intervention studies evaluating UPF consumption in infants and children were examined. Outcomes of interest included anthropometric indicators (weight-for-length, BMI Z-scores, stunting), obesity and body fat accumulation, cardiometabolic risk markers, and micronutrient intake. Environmental and sociodemographic factors associated with UPF consumption were also considered.
Results: Most studies reported a high contribution of UPFs to total daily energy intake in children. Higher UPF consumption was frequently associated with adverse growth outcomes, including increased BMI Z-scores, higher body fat percentage, stunting, and an elevated risk of overweight and obesity. In addition, UPF intake was linked to increased cardiometabolic risk factors such as abdominal obesity, dyslipidemia, and elevated blood pressure. Several studies also demonstrated that UPF consumption was associated with inadequate intakes of key micronutrients, including iron, calcium, zinc, and vitamins A and B-complex.
Conclusions: Overall, the evidence suggests that high UPF consumption during infancy and childhood may negatively affect growth, nutritional status, and cardiometabolic health. Reducing UPF intake and promoting unprocessed or minimally processed foods from early life may represent an important public health strategy to improve child health outcomes.

PV151 / #461

BEYOND WEIGHT: HOW EATING BEHAVIOUR SHAPES METABOLIC HEALTH IN CHILDHOOD OBESITY

OBESITY

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Background and Aims: "Food approach" domains of the Child Eating Behaviour Questionnaire (CEBQ) are positively associated with adiposity, whereas "food avoidance" domains show negative associations. But how these appetitive traits relate to metabolic health among children with obesity? This study associates the CEBQ subscales and metabolic phenotype (metabolically healthy obesity (MHO) vs. metabolically unhealthy obesity (MUO)) in school-aged children.
Methods: Cross-sectional study. 27 children aged 6–12 years followed at a Central Hospital in Portugal. Parents completed the CEBQ. Metabolic phenotype was defined according to Damanhoury et al., (blood pressure, fasting glucose, triglycerides, and HDL-cholesterol). For each subscale (Food Responsiveness (FR), Enjoyment of Food (EF), Emotional Overeating (EOE), Desire to Drink (DD), Satiety Responsiveness (SR), Slowness in Eating (SE), Emotional Undereating (EUE), and Food Fussiness (FF)) a mean score (1–5) was computed and three composite domains were derived following Emotional Eating (EE), Food Fussiness (FF), and Food Reward (FRew) according to Manzano et al. Associations between CEBQ scores and metabolic phenotype were analysed using Mann–Whitney U tests.
Results: MUO children showed higher median mean scores for SE, FF, EUE, EOE, DD, and EE, with the largest difference for EOE (MUO: 2.75 [1.63-3.00] vs. MHO: 1.00 [1.00-2.63]). MHO children scored higher in FR, EF and FRew. No group differences reached statistical significance ($p > 0.05$).
Conclusions: Distinct trends in appetitive traits were observed between MHO and MUO children. Larger longitudinal studies are warranted to clarify whether specific eating behaviour patterns predict metabolic health trajectories in childhood obesity.

PV152 / #464

EMOTIONAL EATING IS RELATED TO ADIPOSITY AND PROTEIN ADEQUACY IN SCHOOL-AGED CHILDREN WITH OBESITY

OBESITY

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Background and Aims: Eating behaviours in childhood shape dietary patterns and may influence body composition. Evidence in clinical paediatric populations remains scarce. This study aimed to examine the associations between eating behaviour, body composition and dietary intake in school-aged children with obesity.
Methods: Cross-sectional study. 30 children with obesity (6–12 years) followed at a Central Hospital in Portugal. Parents completed the Children's Eating Behaviour Questionnaire(CEBQ). Three domains previously adapted to children with obesity by Manzano et al. were evaluated: Emotional Eating (EE), Food Fussiness (FF), and Food Reward (FRew) (scores 1–5). BMI was derived from measured weight and height. Waist circumference (WC) was measured. WC/height ratio was calculated. Fat mass (FM, kg and %) was estimated by air displacement plethysmography (n=28). Energy and macronutrient intake were obtained from a 3-day non-consecutive food diary (n=29) and compared with EFSA recommendations. Associations were analyzed using Spearman correlations.
Results: EE showed a significant positive association with FM (kg) (ρ=0.443; $p<0.05$). EE showed a significant negative association with protein intake adequacy (ρ= −0.461; $p<0.05$). EE showed moderate correlations with %FM (ρ=0.312) and weight (ρ=0.305) (non-significant). FR showed a moderate negative correlation with saturated fat intake (non-significant). FF showed a moderate positive correlation with carbohydrate intake (non-significant). All other correlations were weak or absent.
Conclusions: In school-aged children followed in clinical care, higher EE may reflect vulnerability to increased adiposity and lower protein adequacy. FR and FF demonstrated limited non-significative associations with dietary intake. Larger studies are needed to clarify these preliminary patterns and clinical implications.

PV153 / #644

MATERNAL OVERWEIGHT AND OBESITY: KNOWLEDGE AMONG POLISH WOMEN REMAINS INSUFFICIENT

OBESITY

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Background and Aims: The growing prevalence of overweight and obesity among women of reproductive age poses significant risks for pregnancy outcomes and future health of both mothers and their infants. Improving awareness and understanding of these issues is essential for implementing effective preventive strategies.
Methods: We conducted a cross-sectional survey among 958 women planning pregnancy, currently pregnant, and mothers to assess their knowledge and attitudes regarding overweight and obesity in the perinatal period. The questionnaire included items on lifestyle behaviors, breastfeeding practices, and knowledge related to overweight and obesity in pregnancy.
Results: The findings revealed considerable deficits in knowledge regarding the adverse health effects of maternal overweight, accompanied by common misunderstandings of pregnancy-related dietary recommendations. Knowledge levels varied significantly across key demographic and reproductive factors in univariable analyses, with higher scores observed among women with higher education, prior childbirth experience, and those who had attended antenatal classes (all $p < 0.05$). In the multivariable model, three factors remained independent predictors of higher knowledge: current breastfeeding, participation in antenatal classes, and older maternal age.
Conclusions: Knowledge about the consequences of maternal overweight and obesity in pregnancy was generally low in this population. Healthcare-based education - particularly counselling provided during pregnancy - may be essential to improving maternal awareness and supporting prevention of obesity-related risks.

PV154 / #130

MECHANISMS AND CLINICAL INSIGHTS INTO OBESITY-DRIVEN GENDER DIFFERENCES IN PUBERTAL TIMING: COMPREHENSIVE SYSTEM REVIEW

OBESITY

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Background and Aims: The global rise in childhood obesity has markedly influenced pubertal development, but the effects differ significantly between genders. While obesity in girls is frequently associated with earlier onset of puberty, in boys it is often linked to delayed or altered pubertal progression. the aim was to review and synthesize the current evidence on the mechanisms by which obesity leads to early puberty in girls and delayed puberty in boys, highlighting gender-specific hormonal pathways and contributing factors.
Methods: A literature review was conducted covering studies published from 1999-2024. Studies involving children and adolescents with BMI ≥85th percentile were selected. Both observational and mechanistic studies were included.
Results: In girls, obesity accelerates puberty via increased leptin signaling,insulin resistance,and enhanced aromatization of androgens to estrogens. Leptin stimulates the HPG axis, while hyperinsulinemia promotes ovarian estrogen production. Adipokine-driven inflammation and environmental estrogens may also contribute. In boys,excess adiposity increases aromatase activity,raising estradiol levels that suppress the HPG axis,delaying puberty. Leptin resistance,chronic inflammation,and insulin resistance impair testicular function. Psychosocial stress and inactivity may also play roles. Population studies, including a meta-analysis of 65,000+children, confirm this genders dimorphism: earlier puberty in obese girls, delayed development in obese boys.
Conclusions: Obesity has contrasting effects on pubertal timing in girls and boys, mediated by differential hormonal and metabolic pathways. Early identification of these patterns is crucial for managing associated reproductive, metabolic, and psychological consequences. Future research should focus on longitudinal, genders-specific studies to refine clinical guidelines and develop targeted interventions for pubertal disorders in obese youth.

PV155 / #463

DIETARY COMPOSITION AND METABOLIC RISK PARAMETERS IN CHILDHOOD OBESITY: A CLINICAL–NUTRITION CORRELATION STUDY

OBESITY

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Background and Aims: In childhood obesity, the interplay between nutrient intake and metabolic risk remains underexplored from both clinical and nutritional perspectives. This study examined associations between specific dietary components and metabolic parameters in children with obesity.
Methods: Cross-sectional study. Children aged 6-12 years with obesity were evaluated for metabolic markers: fasting glucose, triglycerides, HDL-cholesterol, waist circumference (WC), and blood pressure (BP). Dietary intake was assessed through a 3-day non-consecutive food diary (two weekdays and one weekend day). Spearman's correlation coefficients were used to explore associations between nutrient intake (saturated fat, simple sugars, total carbohydrates, fibre) and metabolic markers.
Results: 27 participants with median BMI of 26.1 kg/m^2 (z-score 2.93). Median metabolic parameters were: triglycerides 61 mg/dL; HDL-cholesterol 51 mg/dL; fasting glucose 84 mg/dL; systolic BP 110 mmHg; diastolic BP 67 mmHg and WC 78.3cm. Values above 90th percentile were found for WC (73.3%), systolic (18.5%) and diastolic (11.1%) BP. Moderate positive correlations were identified between saturated fat intake and triglyceride levels ($\rho = 0.472$, $p = 0.010$) and between saturated fat and systolic BP ($\rho = 0.443$, $p = 0.024$). Simple sugar intake correlated positively with diastolic BP ($\rho = 0.439$, $p = 0.025$), and total carbohydrate intake correlated with diastolic BP ($\rho = 0.496$, $p = 0.010$).
Conclusions: Higher intakes of saturated fat, sugars, and carbohydrates were linked to adverse metabolic outcomes, particularly higher triglycerides and blood pressure. These findings highlight the importance of diet quality in preventing metabolic deterioration in children with obesity.

PV156 / #460

BEYOND WEIGHT IN CHILDHOOD OBESITY: DIETARY INTAKE AND THE METABOLIC HEALTHY VS UNHEALTHY PHENOTYPE

OBESITY

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Background and Aims: Childhood obesity remains a major public health issue, with heterogeneity in metabolic risk: some children maintain a metabolically healthy obesity (MHO) profile, while others develop metabolically unhealthy obesity (MUO). This study compared dietary intake between metabolically healthy and unhealthy children with obesity.
Methods: Cross-sectional study. Children aged 6-12 years with obesity, followed at a Central Hospital in Portugal. Clinical assessment: fasting glucose, triglycerides, HDL-cholesterol, waist circumference, and blood pressure to determine metabolic phenotype. Dietary intake was recorded using a 3-day non-consecutive food diary (two weekdays and one weekend day). Nutrient profiles (energy, macronutrients, saturated fat, salt, fibre) were compared.
Results: 27 participants, 7 (25.9 %) were classified as MUO. MUO children consumed more total fat ($p = 0.004$), saturated fat ($p < 0.01$), and salt ($p = 0.048$). Descriptive trends showed lower fibre (14.2 g vs 17.0 g) and higher energy (1720 kcal vs 1503 kcal), carbohydrate (203 g vs 174 g), sugar (62.3 g vs 60.2 g) and protein (105 g vs 67 g) intakes in MUO participants.
Conclusions: This integrated clinical-nutritional analysis indicates that metabolically unhealthy children with obesity exhibit poorer dietary profiles. Beyond phenotype, nutritional quality, particularly saturated fat, salt and fibre, may influence metabolic regulation. These findings underscore the need for targeted interventions and larger longitudinal studies to confirm causal relationships and guide prevention strategies in childhood obesity.

PV157 / #769

PREDICTIVE MARKERS FOR PREDICTING METABOLICALLY UNHEALTHY OBESITY

OBESITY

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Background and Aims: The use of whole genome sequencing has revealed that over 500 candidate genes are associated with the development of obesity. However, the following remain poorly understood: the rank distribution of SNVs of different genes by the level of contribution to the transition from the metabolically healthy obesity (MHO) phenotype to the metabolically unhealthy obesity (MUO) phenotype. Objective: To calculate the odds ratio regarding the contribution of identifying single nucleotide variants of candidate genes to the probability of developing different metabolic phenotypes of obesity.
Methods: 350 children with obesity aged 6-18 years were examined. Among obese children, two observation subgroups with metabolically unhealthy obesity (MUO, n=204) and metabolically healthy obesity (MHO, n=146), were separated. The level of basal glycemia, insulinemia was studied by immunochemical method with electro chemiluminescent detection in the Synevo (Ukraine). Whole genome sequencing was performed on 52 children at the CeGat laboratory (Germany).
Results: The most informative prognostic markers for predicting metabolically unhealthy obesity were identified as the following genotypes: GG rs1057031 of the MCM6 gene (OR=13), CT/TT rs1800139 of the LRP1 gene (OR=8.33), CG/GG rs738409 of the PNPLA3 gene (OR=6.47), AT/TT rs4684677 of the GHRL gene (OR=4.38), TC/CC rs3790435 of the LEPR gene (OR=4.38), AG/GG rs12721365 of the VDR gene (OR=3.88), AC/CC rs1042044 of the GLP1R gene (OR=3.53), CG/GG rs754635 of the CCK gene (OR=3.5), CG/GG rs713598 of the TAS2R38 gene (OR=3), CC rs17823223 of the FTO gene (OR=2.33).
Conclusions: The GG rs1057031 genotype of the MCM6 gene is the most informative prognostic marker for predicting MUO.

PV158 / #768

INNATE MUSICALITY AS A FACTOR MODULATING THE RISK OF CHILDHOOD OBESITY

OBESITY

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Background and Aims: Genomic studies reveal shared genetic architecture underlying complex traits, including musicality as an endophenotype, eating behavior, and metabolic disorders such as obesity. The transcription factor GATA2 plays a key role in inner ear development and acts as a negative regulator of adipogenesis, with its downregulation promoting fat cell differentiation. Variants in GATA2 have been linked to auditory traits and metabolic dysregulation. Objective: To investigate the genetic association between innate musicality and obesity risk in children via single-nucleotide variants (SNVs) in the GATA2 gene.
Methods: A total of 446 children aged 6–18 years were enrolled: 346 with obesity (main group) and 100 non-obese controls. Innate musical abilities were assessed using the Seashore test battery. Whole-genome sequencing (NGS; CeGaT, Germany) was performed in 52 obese children for variant discovery. Candidate SNV rs11708606 in GATA2 was subsequently genotyped in the full cohort. Reference genomes were sourced from global biobanks and NCBI RefSeq.
Results: Lower innate musical ability significantly correlated with higher BMI ($r=0.56$; $p<0.05$). The AA genotype of rs11708606 in GATA2 (sensitivity=62.86%; specificity=85.71%; AUC=0.74; $p=0.003$) was associated with a 10.15-fold increased obesity risk in children with low musical ability (95% CI 1.96–52.69; $p=0.006$).
Conclusions: These preliminary findings suggest that the AA genotype of GATA2 rs11708606 is associated with reduced innate musical abilities and elevated obesity risk in children, potentially linking auditory and metabolic pathways.

PV159 / #212

SINGLE NUCLEOTIDE VARIANT RS17492553 OF THE TAS1R1 GENE AND TASTE PREFERENCES ASSOCIATED WITH THE DEVELOPMENT OF METABOLICLY UNHEALTHY OBESITY IN CHILDREN

OBESITY

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Background and Aims: Altered umami taste perception associated with the single nucleotide variant (SNV) in the taste 1 receptor member 1 (*TAS1R1*) gene may contribute to excess fat accumulation and predict the obesity phenotype. **Objective:** To determine the risk of developing metabolically unhealthy obesity in children with SNV rs17492553 *TAS1R1*.
Methods: 350 children with obesity aged 6-18 years were examined. Among obese children, two observation subgroups with metabolically unhealthy obesity (MUO, n=204) and metabolically healthy obesity (MHO, n=146), were separated. The level of basal glycemia, insulinemia was studied by immunochemical method with electro chemiluminescent detection, high-density lipoproteins and triglycerides – by enzymatic-colorimetric method in the Synevo (Ukraine). SNVs of the *TAS1R1* gene were identified by whole-genome next-generation sequencing in 52 at the CeGat laboratory (Germany).
Results: Of the six identified SNV (rs10864628, rs17492553, rs34160967, rs35118458, rs35375392, rs41278020) *TAS1R1*, only SNV rs17492553 was associated with the development of MUO, determining a decrease in the content of luteinizing hormone and 25-hydroxycalciferol in the blood serum.
Conclusions: Carriers of the CT genotype of SNV rs17492553 *TAS1R1* are 2.73 times more likely to develop metabolically unhealthy obesity than CC homozygotes.

PV160 / #249

EFFECTS OF DIETARY N-3 AND N-6 POLYUNSATURATED FATTY ACIDS IN ENERGY METABOLISM

OBESITY

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Background and Aims: Dietary fats affect diet-induced thermogenesis (DIT) and energy expenditure; however, not all fatty acids exertthe same metabolic effects. Among different types of dietary fatty acids, polyunsaturated fatty acids (PUFAs) are oxidized more rapidly than saturated fatty acids (SFAs), which are more likely to be stored in adipose tissue. Evidence suggests that PUFA can affect body weight, body composition, appetite, and energymetabolism. This review aims to evaluate the effects of PUFA on energy metabolism.
Methods: The MEDLINE, ScienceDirect and Web of Science databases were searched for relevant clinical trials and randomised trials published between January 2000 and June 2024 with no language restrictions. Each database was searched individually using advanced search strategies and a combination of relevant keywords.
Results: The effects of n-3 and n-6 PUFAs on energy metabolism were summarized based on findings from both animal and human studies. Potential mechanisms through which these fatty acids influence energy metabolism, including effects on body weight, body composition, thermogenesis, and appetite, were also examined.
Conclusions: Conjugated linoleic acid (CLA), an n-6 fatty acid, docosahexaenoic acid (DHA), and eicosapentaenoic acid (EPA) n-3 fatty acids may help prevent or alleviate obesity. These fatty acids influence the balance between energy intake and expenditure and have been shown to reduce body weight and/or fat accumulation in animal models; however, their effects in healthy humans remain unclear. Future studies should further explore the mechanisms by which dietary n-6 and n-3 PUFAs affect energy metabolism and support the development of evidence-based dietary strategies.

PV161 / #443

INTERACTION BETWEEN MATERNAL ADIPOSITY AND ULTRA-PROCESSED FOOD CONSUMPTION IS ASSOCIATED WITH ALTERED IMMUNOLOGICAL PROPERTIES OF HUMAN MILK

OBESITY

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Background and Aims: Human milk contains immunomodulatory proteins that can be affected by maternal factors. This study evaluated the effect of maternal adiposity and intake of ultra-processed foods (UPF) on secretory immunoglobulin A (S-IgA) and lactoferrin (Lf) in human milk.
Methods: This case-control study was conducted among 46 women (n=25, BMI <25 kg/m^2, NW; n=21, BMI ≥25 kg/m^2, OW/OB group) who were breastfeeding for 15.2±1.5 weeks. Maternal body composition (fat (FM) and fat-free mass (FFM), visceral (VAT) and subcutaneous (SAT) adipose tissue) was assessed using dual-energy X-ray absorptiometry. Maternal dietary information was collected using the 3-day food records, and foods were classified based on the degree of processing according to the NOVA classification. Human milk S-IgA and Lf were measured using enzyme-linked immunosorbent assay (ELISA).
Results: The mean total energy intake from UPF was 31.4 (95%CI: 26.9–35.9), human milk S-IgA median concentration was 3.7 (Q1–Q3: 3.1–5.1) g/L, and the mean Lf concentration was 5.7 (5.0–6.4) g/L with no significant difference between the NW and OW/OB groups. Linear regression analysis explained 84 to 94% of the variability in S-IgA and Lf concentrations, revealing that maternal adiposity and UPF intake were associated with increased milk S-IgA (BMI, WC, FM, VAT, and SAT) and Lf (VAT and SAT). However, analysis of the interaction between maternal adiposity and UPF intake showed a decrease in S-IgA and Lf in mothers with higher adiposity and UPF intake.
Conclusions: Our findings highlight the importance of promoting a healthier diet, especially among mothers with increased adiposity.