LBP3.04

Epigenetic signatures in saliva of offspring from mothers with Gestational Diabetes: longitudinal associations with early growth

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Introduction: The prevalence of obesity and type 2 diabetes mellitus (T2DM) is rising globally, particularly among children exposed to adverse intrauterine environments, such as those associated with gestational diabetes mellitus (GDM). Epigenetic modifications, specifically DNA methylation, have emerged as mechanisms by which early environmental exposures can predispose offspring to metabolic diseases. This study aimed to investigate DNA methylation differences in children born to mothers with GDM compared to those born to mothers without GDM, using saliva samples, and to assess the association of these epigenetic patterns with early growth measurements.
Methods: This study analyzed saliva DNA methylation patterns in 30 children (15 born to mothers with GDM and 15 to mothers without GDM) from the EPIDG cohort. Samples were collected at two time points: 8–10 weeks postpartum and at one year of age. Epigenome-wide analysis of over 850,000 CpG sites was conducted using the Illumina Methylation EPIC Bead Chip. Differential methylation positions (DMPs) were identified with the limma package, using a significance threshold of $p < 0.01$ and delta $\beta \geq 5\%$. Correlation analysis examined associations between methylation and growth variables (weight, height, BMI and annual growth) using Spearman tests.
Results: We identified 6,968 DMPs at the postpartum stage and 5,132 after one year, with 50 sites remaining differentially methylated over time, 16 of which maintained consistent methylation directionality. Functional analysis linked several of these DMPs to genes involved in inflammation and metabolic processes, including CYTH3 and FARP2, both implicated in growth and metabolic pathways. Significant correlations were found between specific CpG sites and growth-related variables such as weight, head circumference, height, and BMI.
Conclusions: This study's longitudinal design reveals stable DNA methylation patterns in saliva samples that differentiate children born to mothers with GDM compared to those born to mothers without GDM across the first year of life, highlighting the feasibility of saliva as a minimally invasive biomarker source. The persistence of these epigenetic signatures underscores their potential as early indicators of metabolic risk, offering valuable insights into the long-term impact of GDM during pregnancy on children's health and development. Although the use of saliva offers a practical and non-invasive tool for paediatric epigenetic research, further studies are necessary to validate these findings in larger populations.
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LBP3.05

Co-Creation of Digital Health Interventions with Children: Initial Results of the Multi-Country Workshop in the BIO-STREAMS Project

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Background: Digital health interventions show promise in preventing childhood obesity, yet their effectiveness depends heavily on understanding and incorporating users' values and preferences. Limited research exists on value-sensitive design approaches incorporating children's perspectives across different European contexts.
Objective: To identify key values, preferences, and requirements of children for digital health interventions. These findings will directly inform the design of BIO-STREAMS digital solutions and guide the design and implementation of BIO-STREAMS prospective studies aimed at childhood obesity prevention.
Methods: Structured workshops with children (aged 8 to 18) in educational and clinical settings, in Belgium, Bulgaria, Denmark, Greece, Netherlands, Slovenia, Spain, Sweden, and Portugal. We are using participatory design methods including presentations, demonstrations, mock-ups, group discussions, and interactive activities to explore children's perspectives on healthy lifestyles, digital learning preferences, and engagement requirements. Data is analyzed using thematic analysis approach.
Results: Workshops included 23 children from clinical (still ongoing) and 181 from educational settings. Initial findings show setting-specific differences: children in clinical settings prioritized health tracking and structured approaches, while those in educational settings favored social interaction. Age-specific patterns emerged from play-based learning in younger children (<8y) to complex digital engagement in adolescents (14-18y). Overall, key requirements include age-adaptive interfaces. These should progress from visual/play-based to social/autonomous features, balancing individual health tracking with social engagement. All interventions and interfaces should incorporate interactive elements, cultural sensitivity, achievement systems, flexible parental controls, and privacy features.

Conclusions: Initial findings emphasize the need for age-specific customization in digital health interventions and balance between digital and in-person interaction. Effective interventions should include social features, cultural sensitivity, and age-appropriate achievement systems with contextual flexibility. These insights can inform the design of more engaging and sustainable childhood obesity prevention programs.The results of workshops have already be used to inform the design of BIO-STREAMS digital interventions and can be used in the future for more engaging, long-term sustainable and more effective childhood obesity prevention programs.

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LBP3.06

Mediterranean diet adherence, sleep adequacy and obesity prevalence among students in remote areas of Greece: A cross-sectional study

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Introduction: Childhood obesity is a multifactorial disease and a significant global public health concern. Lifestyle factors, including dietary habits and sleep patterns, have been linked to weight status. Additionally, limited access to healthcare services in remote areas has been associated with poorer health outcomes, including higher obesity prevalence. This study aimed to assess the prevalence of overweight and obesity in a large sample of children living in remote rural areas of Greece and to examine the association between adherence to the Mediterranean Diet (MD), sleep adequacy and weight status.
Methods: This cross-sectional, population-based observational study included children aged 8 to 18 years, recruited from primary and secondary public schools in 29 remote areas of Greece, both island and mainland. Anthropometric measurements were recorded, and adherence to the MD was assessed using the KIDMED questionnaire. Sleep duration was evaluated based on self-reported wake-up and bedtime on weekdays and weekends. Multivariable logistic regression was employed to assess associations between diet quality, sleep adequacy, and the likelihood of overweight and obesity.
Results: A total of 938 students participated in the study, including 458 boys (48.8%) and 480 girls (51.2%). Among them, 52.5% resided in remote mainland areas, while 47.5% lived on remote islands. The prevalence of overweight, obesity, and central obesity was 24.7%, 14.1%, and 36.9%, respectively. In terms of MD adherence, 15.4% of students had low adherence, 50.1% had moderate adherence, and 34.6% had high adherence. Regarding sleep duration, 15.2% of students were classified as short sleepers and 5.2% as long sleepers. No significant differences were observed between boys and girls.
Students with low MD adherence were 2.5 times more likely to be overweight or obese (OR 2.52, 95% CI: 1.66-3.83, p<0.001) and 1.6 times more likely to have central obesity (OR 1.63, 95% CI: 1.06-2.53, p=0.021) compared to those with high MD adherence. Furthermore, students with low MD adherence had 1.8 times the likelihood of being overweight or obese (OR 1.83, 95% CI: 1.24–2.71, p=0.003) compared to those with moderate adherence. Additionally, students with moderate MD adherence were 37% more likely to be overweight or obese (OR 1.37, 95% CI: 1.01-1.88, p=0.044) than those with high adherence.
Short sleepers were 2.6 times more likely to be overweight or obese (OR 2.63, 95% CI: 1.38–5.01, p=0.003) compared to students with adequate sleep duration. Notably, students with low MD adherence were three times more likely to be short sleepers (OR 3.22, 95% CI: 1.26–8.2, p=0.014) compared to those with high adherence.
Conclusion: Consistent with previous studies in urban populations, our findings suggest that among students living in remote mainland and island areas, higher adherence to the MD is associated with a lower risk of overweight and obesity, while short sleep duration is linked to a higher risk. These results highlight the importance of promoting the MD and adequate sleep in remote areas as key strategies for combating obesity.

LBP3.07

Harms Reporting in Pharmacological Randomized Controlled Trials in Children and Adolescents with Obesity: A Systematic Review

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Introduction: Medications (e.g., GLP-1 receptor agonists, metformin) are increasingly being used in pediatric obesity management. This systematic review aimed to (i) explore the extent of harms reporting in pharmacological randomized controlled trials (RCTs) for managing obesity in children and adolescents and (ii) identify the types of harms (i.e., physical vs. psychosocial) reported.
Methods: A database search was conducted to identify RCTs of pharmacological interventions for children and adolescents (median age <18 years) with obesity in MEDLINE, Embase, and Cochrane Library published up to November 2022. Two reviewers independently screened articles and extracted data on harms reporting using the Consolidated Standards of Reporting Trials (CONSORT) Harms 2022 Statement guidance for reporting harms in RCTs and other detailed questions about harms reporting created by our research team.
Results: 35 trials (published from 2001 to 2022) were included, and 30 reported harms. There were no studies that reported on all CONSORT Harms items. No trials reported a definition of "harms" or how harms were measured (e.g., based on a discrete definition, visual analogue scale). Only two studies (6%) reported adhering to CONSORT Harm-reporting standards, five (17%) reported open accessibility of harms data, and seven (23%) reported the statistical analytic method used to assess harms. Of the 30 studies that reported harms, 29 studies (97%) reported multiple