

⁷ Department of Obstetrics, Centro Hospitalar Universitário São João

⁸ Knowledge Management Unit, Faculty of Medicine, University of Porto

⁹ RISE-Health, Department of Community Medicine, Information and Health Decision Sciences (MEDCIDS), Faculty of Medicine, University of Porto

¹⁰ Department of Gynecology-Obstetrics and Pediatrics, Faculty of Medicine, University of Porto, RISE-Health, Faculty of Medicine, University of Porto

¹¹ RISE-Health, Faculty of Medicine, University of Porto

¹² Ciências Químicas e das Biomoléculas, Escola Superior de Saúde do Instituto Politécnico do Porto

¹³ RISE-Health, Centro de Investigação em Saúde Translacional e Biotecnologia Médica (TBIO)/Rede de Investigação em Saúde (RISE-Health), Escola Superior de Saúde do Instituto Politécnico do Porto

INTRODUCTION: Exposure to toxic elements such as Lead (Pb), Cadmium (Cd), Lithium (Li) and Arsenic (As) pose health risks particularly for vulnerable groups like pregnant women and children. Knowledge about toxic metal exposure in these groups is scarce in Portugal.

OBJECTIVES: This study aims to identify food and lifestyle determinants of maternal exposure to toxic elements.

METHODOLOGY: Pregnant women from the IoMum cohort, undergoing first-trimester fetal ultrasound between April 2018 and December 2021 at CHUSJoão (Porto) and Hospital CUF Descobertas (Lisbon), were invited to participate. At this stage, dietary and lifestyle information was collected through a structured questionnaire. A random urine sample was collected for Pb, Cd, Li and total (inorganic + organic) As quantification by ICP-MS and the values were adjusted for urinary creatinine concentration. A total of 305 mother: child pairs were included.

RESULTS: The majority of the sample had detectable urinary levels of toxic elements (n (%): 269 (88), 157 (52), 305 (100) and 293 (96) for Pb, Cd, Li and total As, respectively). Pb urinary concentration was inversely associated with education level ($p=0.008$) while Cd and As levels were positively associated with education level ($p<0.001$ and 0.002 , respectively). Smoking was associated with higher Pb levels ($p<0.001$). Fish intake frequency was positively associated with Cd and As levels ($p=0.005$ and $p<0.001$, respectively) with women with fish intake higher than 4 times a week presenting median (P25;P75) in $\mu\text{g/g}$ total As 33.8 (20.9 ; 67.7) concentration above the reference range typically ($\geq 24.0 \mu\text{g/g}$), seen in a group of healthy individuals. On the other hand, milk intake frequency was inversely associated Pb levels ($p=0.025$).

CONCLUSIONS: Our results suggest that fish consumption may be a significant source of Cd and As exposure and that a higher milk intake may have a protective effect against Pb exposure.

ACKNOWLEDGMENTS: This work was supported by national funds through the FCT Foundation for Science and Technology, I.P., within the scope of the projects "RISE—LA/P/0053/2020" and "CINTESIS, R&D UNIT (REFERENCE UIDB/4255/2020)". Juliana Guimarães was funded by FCT/MCTES (Foundation for Science and Technology and Ministry of Science, Technology and Higher Education) under CINTESIS by a PhD scholarship (reference UI/BD/152087/2021).

PO21. A NUTRITIONAL INTERVENTION TO PROMOTE MEDITERRANEAN DIET IN HIGH-RISK PREGNANCIES: PRELIMINARY RESULTS FROM A RANDOMIZED TRIAL

Carlota Gonçalves¹; Juliana Morais^{1,2}; Ana Filipa Ferreira¹; Carla Ramalho^{3,4}; Benedita Sampaio-Maia^{5,7}; Inês Falcão-Pires¹

¹ RISE-Health, Department of Surgery and Physiology, Faculty of Medicine of the University of Porto

² Department of Functional Sciences, School of Health, Polytechnic Institute of Porto

³ Obstetrics, Gynaecology and Pediatrics Department, Faculty of Medicine of the University of Porto

⁴ Pediatric Cardiology Department, Unidade Local de Saúde de São João

⁵ IS - Instituto de Investigação e Inovação em Saúde da Universidade do Porto

⁶ INEB - Instituto Nacional de Engenharia Biomédica

⁷ Faculdade de Medicina Dentária, Universidade do Porto, Portugal CINTESIS, Center for Health Technology and Services Research

INTRODUCTION: The rising prevalence of obesity during women's reproductive years highlights the need for effective strategies to improve nutritional literacy as a preventive approach to adverse postpartum outcomes.

OBJECTIVES: This pilot randomized controlled trial aims to evaluate the impact of nutritional education sessions promoting the Mediterranean Diet (MedDiet) on Mediterranean Diet Adherence Screener (MEDAS), preconception weight recovery, and cardiometabolic outcomes.

METHODOLOGY: A PERIMYR-OralBioBorn mother-infant birth cohort sub-sample with obesity, hypertension, and/or diabetes was randomized to receive a MedDiet intervention, that consisted of a face-to-face session using a 13-page manual, followed by five monthly newsletters. Participants were re-evaluated at one, and six months postpartum. To assess the adherence to the MedDiet, the 14-item questionnaire MEDAS validated for the Portuguese population was used. Cardiac function and structure during pregnancy and postpartum were evaluated by echocardiography. Statistical analyses included Chi-square tests, T-tests, and Mann-Whitney tests.

RESULTS: Fifty-six women with cardiometabolic risk factors (obesity, diabetes, and/or hypertension), with a median age of 33 [30; 36.5] years in the third trimester of pregnancy, were included. No significant differences in MedDiet adherence scores were observed between control and intervention groups before the intervention (8.6 ± 1.8 vs. 8.5 ± 1.5 , $p=0.815$). One month postpartum, both groups maintained moderate adherence (7.7 ± 2.1 vs. 8.2 ± 2.6 , $p=0.731$), with no differences between groups at six months (7.4 ± 1.9 vs. 8.1 ± 2.3 , $p=0.466$). The intervention did not affect preconception weight recovery at six months. However, the intervention group showed better cardiac relaxation (E/e' ratio) than controls (5.7 ± 1.4 vs. 6.6 ± 1.4 , $p=0.042$), with no differences in cardiac mass or left ventricle wall thickness regression 6 months postpartum.

CONCLUSIONS: Although preliminary findings do not indicate a significant change in MedDiet adherence scores or weight recovery, we observed improved left ventricular diastolic function. Future research incorporating detailed dietary intake assessments, metabolic biomarkers, and physical activity tracking could help clarify these effects.

PO22. IMPACT OF MATERNAL STEVIA CONSUMPTION ON OFFSPRING'S METABOLIC HEALTH: A ROLE IN FETAL PROGRAMMING

Isabella Bracchi^{1,2}; Margarida Barbosa³; Maria Inês Vieira³; Sofia Brandão³; Ana Carolina Esteves³; Carina Martins⁴; Inês Rocha^{5,6}; Diogo Pestana⁷; Rita Negrão¹; Elisa Keating¹

¹ RISE-Health, Department Biomedicine, Unit of Biochemistry, Faculty of Medicine, University of Porto

² Department of Functional Sciences, School of Health, Polytechnic Institute of Porto

³ Unit of Biochemistry, Department Biomedicine, Faculty of Medicine, University of Porto

⁴ Faculty of Nutrition and Food Sciences, University of Porto

⁵ Faculty of Health Sciences, Fernando Pessoa University

⁶ Nutrition & Metabolism, NOVA Medical School|FCM, NOVA University Lisbon

⁷ CHRC | Nutrition and Metabolism, NOVA Medical School | FCM, NOVA University Lisbon

INTRODUCTION: The consumption of non-sugar sweeteners (NSS) by pregnant women has increased in recent decades. Stevia, a natural NSS, is generally

considered safe, but the World Health Organization recently recommended restricting the use of NSS, including stevia, highlighting the need to assess their safety during early stages of development.

OBJECTIVES: To investigate the role of RebaudiosideA (RebA) consumption, the main sweetener component of Stevia, as a fetal programmer of metabolic dysfunction.

METHODOLOGY: Female Sprague Dawley rats were administered RebA in the drinking water (4mg steviol equivalents/kg bodyweight/day, corresponding to the EFSA's ADI) from 4 weeks before mating until weaning (total 13 weeks) (RebA, n=8), or water as control (C, n=8). Offspring (G1, both sexes) were weaned at 3 weeks of age into a standard diet until 10 months of age. G1 morphometry, food and water consumption were assessed. G1 glucose homeostasis was assessed by oral glucose tolerance (OGTT) and insulin sensitivity tests (IST) at 2, 6 and 10 months of age. Two-way ANOVA, with Sidak correction, was performed to test the effect of time, RebA, and the interaction between them.

RESULTS: Female offspring early exposed to RebA (RebA-G1) presented greater weight gain from 30 weeks of age and onwards when compared to matched controls (p=0.0165). Food and water consumption were similar between groups. Early exposure to RebA changed the glycemic response of female G1 over time during the IST (p=0.0200) at 10 but not at 2 or 6 months of age. Male RebA-G1 presented higher glycemia 2h-post OGTT at 10 months of age, when compared to matched controls (p=0.0197).

CONCLUSIONS: Maternal RebA consumption during the perigestational period led to increased weight gain and signs of insulin resistance in female offspring, and a degree of dysglycemia in male offspring. These findings strongly suggest a role of RebA in fetal programming of metabolic dysfunction.

PO23. FOOD SUPPLY IN SCHOOL CONTEXT IN PORTUGAL AND ITALY FOR CHILDREN BETWEEN 6 AND 10 YEARS OLD: A QUALITATIVE ASSESSMENT AND A STUDY OF THE MAIN ASSOCIATED FACTORS

Alessia Lombardi¹; Beatriz de Oliveira Teixeira^{1,2}; Lorella Vicari^{3,4}; Diana Maria Veloso e Silva¹

¹ Faculty of Nutrition and Food Sciences, University of Porto

² EpiUnit ITR, Institute of Public Health, University of Porto

³ University of Pavia

⁴ Health Protection Agency of Pavia

INTRODUCTION: The global rise in obesity and pre-obesity poses a major public health challenge in Europe, with Italy and Portugal reporting some of the highest pediatric overweight rates. Poor dietary habits established in childhood significantly contribute to this issue, and schools play a crucial role in promoting healthy eating. However, school meals often fail to meet nutritional standards. Additionally, sustainable dietary patterns must be prioritized in response to the environmental crisis.

OBJECTIVES: This study aimed to assess school food offerings for children aged 6–10 years in Portugal and Italy, evaluating healthiness and sustainability while identifying factors associated with menu quality.

METHODOLOGY: A cross-sectional observational study was conducted in 17 Portuguese and 15 Italian public schools. In Portugal, three seasonal menus per municipality were collected, while in Italy, two seasonal menus per school were analyzed. Menu quality was assessed using the SPARE+ tool, the Pavia ATS self-assessment questionnaire, and an adapted SPARE+ tool for Italy. School characteristics were also documented through a questionnaire completed by nutritionists or municipal managers.

RESULTS: Portuguese menus had a 73.3% compliance rate, while Italian menus showed a slightly higher 74.7% compliance rate. Italian menus scored better overall, with both countries excelling in fresh fruit availability, limiting sweets, and

using local products, but lacking whole grains. Italy performed well in protein balance, maintaining recommended meat levels and increasing plant-based options, while Portugal excelled in vegetables and fish, but had excessive meat offerings. No significant correlations were found in Portugal, whereas in Italy, menu quality was positively associated with the number of canteens and meals served, particularly in urban settings during winter.

CONCLUSIONS: Both countries showed good compliance with health and sustainability criteria, with Italian menus performing better overall and showing stronger municipal influence on quality.

PO24. AVALIAÇÃO DA SATISFAÇÃO DOS ALUNOS EM RELAÇÃO À OFERTA ALIMENTAR EM CONTEXTO ESCOLAR NO ENSINO PÚBLICO E PRIVADO

Ana Leonor Rocha^{1,2}; Carolina Teixeira¹; Maria Cristina Teixeira Santos¹; Bruno Oliveira^{1,3}; Cláudia Afonso^{1,4}

¹ Faculdade de Ciências da Nutrição e Alimentação da Universidade do Porto

² Colégio Júlio Dinis

³ LIAAD – INESC TEC, Campus da Faculdade de Engenharia da Universidade do Porto

⁴ EPIUnit ITR, Instituto de Saúde Pública da Universidade do Porto

INTRODUÇÃO: Os hábitos alimentares dos alunos podem ser influenciados pela oferta alimentar disponível no ambiente escolar, sendo importante auscultar e conhecer a satisfação dos mesmos em relação ao que é disponibilizado nas cantinas e nos bares, uma vez que as suas preferências são o principal preditor das suas escolhas alimentares.

OBJETIVOS: O presente trabalho teve como objetivo caracterizar a satisfação dos alunos com a oferta alimentar disponibilizada em duas instituições, de ensino público e privado.

METODOLOGIA: Participaram alunos dos 2.º e 3.º ciclos do ensino básico de uma escola do ensino público e outra de privado. Foi desenvolvido e aplicado um questionário de aplicação direta, para compreender a satisfação dos alunos com a oferta alimentar disponível.

RESULTADOS: Relativamente à cantina, a satisfação foi mais elevada entre os alunos do ensino privado, com o valor médio de 3,56 (dp = 0,982), comparativamente aos do público, com o valor de 2,99 (dp = 1,183) (p<0,001), num valor máximo de 5. O mesmo se passa com a satisfação com o bar, em que o privado apresenta uma satisfação média de 4,30 (dp = 0,826) e o público de 3,94 (dp = 0,992) (p<0,001). Alunos mais satisfeitos com a cantina almoçam lá, mas também em casa, e os mais satisfeitos com o bar são os alunos mais jovens e que realizam as suas refeições no bar.

CONCLUSÕES: Verificou-se que a satisfação no ensino privado é superior para a cantina e bar, e tal como esperado, um maior grau de satisfação com estes serviços estava associado a uma maior adesão aos mesmos. Promover a avaliação da satisfação dos alunos com a oferta alimentar escolar e auscultar as suas expectativas, torna-se essencial para a promoção de hábitos alimentares saudáveis neste grupo etário.

PO25. FERRAMENTA PARA AVALIAR A CONFORMIDADE DAS EMENTAS COM A DIETA MEDITERRÂNICA

Sofia Sousa Silva¹; Ada Rocha^{1,2}; Liliana Ferreira^{1,2}; Beatriz Neto³; Derya Dikmen⁴; Sanja Vidacek Filipec⁵; Zvonimir Satalic⁵; Claudia Viegas^{3,6}

¹ Faculdade de Ciências da Nutrição e Alimentação da Universidade do Porto

² GreenUPorto/Inov4Agro

³ Escola Superior de Tecnologia da Saúde de Lisboa do Instituto Politécnico de Lisboa