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Abstract

The Effects of Low- vs. High-Glycemic Index Mediterranean-Style Eating Patterns on Subjective Well-Being and Sleep in Adults at Risk for Type 2 Diabetes: The MEDGICarb-Intervention Trial †

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Abstract: Background and objectives: Limited evidence exists regarding the influence of glycemic index (GI) in the context of a healthy diet on self-reported health status and sleep. We therefore aimed to investigate the effects of a low- vs. high-GI Mediterranean-style healthy eating pattern (MED-HEP) on subjective well-being and sleep, and whether measures of well-being and sleep were related to glycemia. Methods: The MedGICarb-intervention trial is a 12-week randomized, controlled, parallel multi-center trial (Italy, Sweden and USA). During the intervention, participants consumed an eu-energetic diet profiled as a MED-HEP with either high or low GI. Well-being and sleep were measured by the Medical Outcomes Study 36-Item Short Form Health Survey Version 2 (SF-36v2), Pittsburgh Sleep Quality Index (PSQI) and Epworth Sleepiness Scale (ESS) at baseline and after the 12-week intervention. Similarly, postprandial glucose was measured from oral glucose tolerance tests, and indices of glycemic variability were calculated from 24 h continuous glucose monitoring. Results: 161 adults with ≥2 features of the metabolic syndrome completed the intervention (53% females, mean age 56 ± 10 y, mean BMI 31 ± 3 kg/m^2). Low- vs. high-GI MED-HEP resulted in differential changes between the groups in domains of well-being, driven mostly by improvements in the low-GI group, of which role physical (5.6 AU vs. −2.5 AU, p = 0.022) and vitality (6.9 AU vs. −0.3 AU, p = 0.008) were significant (ANOVA with group, site and sex as fixed factors and age and BMI as covariates). There was no significant difference between the diets for aggregated physical or mental components, or for the other domains of well-being (physical functioning, bodily pain, general health, social functioning, role emotional, mental health) or for sleep quality (PSQI) or daytime sleepiness (ESS). The aggregated physical and mental component, as well as some domains of well-being and sleep quality, were correlated with glycemic measures at baseline (Spearman correlation). Discussion: Low compared to high GI in the context of a MED-HEP resulted in improvements in domains of subjective well-being. No major differences were seen between the groups for indexes of sleep.

Keywords: glycemic index; Mediterranean diet; well-being; sleep; glycemic control

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Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the institutional review board of Federico II University and Purdue University and by the Regional Ethical Review Board, Gothenburg, Sweden. The trial is registered in the public trial database Clinicaltrials.gov as NCT03410719.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

Conflicts of Interest: G.R., W.W.C. and R.L. served as co-principal investigators and are thus co-senior authors. G.R. is a member of the Health and Wellbeing Advisory Board of the Barilla company; remuneration for this activity goes to his University Department. R.L. is the project leader for the Nordic Rye Forum, for which funding is provided by industrial partners and NKJ (Nordic Committee of Agricultural Research). R.L. is also principal investigator in research projects funded by Lantmännen and Barilla. He did not receive any remuneration, salary or any other financial recompense from the food industry. W.W.C. reports no competing interests. R.B. is currently employed by ADM. Research presented in this paper was conducted in a former role and has no connection with ADM. A.H. is offering CGM-based services through her own practice as nutritionist. A.H. has also received consultancy fees from Mäta Health and OneTwo Analytics, two companies that are offering CGM-based services.