Proceedings of the Nutrition Society (2023), **82 (OCE5)**, E363 doi:10.1017/S0029665123004627

Summer Conference 2023, 3–6 July 2023, Nutrition at key stages of the lifecycle

Association between diet quality and cardiometabolic disease risk biomarkers: A cross- sectional analysis in UK adults

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Diet constitutes one of the key modifiable risk factors in the aetiology of CMD[(1)]. Diet quality scores (DQS) measure adherence to a predefined diet to quantify an individual's food and nutrient intakes[(2)]. Although many scores have been defined and used in epidemiological studies to assess diet quality, there is uncertainty about how a priori defined DQS relate to CMD risk. We investigated the relationship between three widely used DQS and a comprehensive range of CMD risk factors in adults living in and around the Reading area.

In this analysis, baseline data (n = 734) was pooled from four randomised controlled trials and one observational study previously conducted in the Hugh Sinclair Unit of Human Nutrition (DIVAS, DIVAS-2, SAT-gene, RESET, and BODYCON) in adults aged 18–70 y. Habitual dietary intakes were obtained using weighed diet diaries of ≥ 3 days. The dietary data was first categorised using a detailed food definition list to standardise the format of the food intake information between studies. The following DQS were calculated: Healthy Eating Index (HEI)-2015, alternate Mediterranean Diet Score (aMED), and Dietary Approaches to Stop Hypertension (DASH) score, where higher scores represent greater adherence to dietary guidelines/patterns. These scores were identified as commonly used DQS[(3)]. Data were first stratified into quartiles (Q) of increasing DQS before analysis using an ANCOVA, with age, sex, supplement use, CVD risk and energy intake as covariates. CMD risk factors -anthropometric measures, blood pressure (BP), fasting blood lipids, blood glucose and insulin- were measured.

The mean age of the participants was 44 (SD 14) y, 42% were male, and two of the studies had recruited participants with a moderate CVD risk (1.5-fold higher than the general population based on the Framingham risk score) which comprised 41% of the cohort. For all DQS, higher scores were associated with lower anthropometric measures (body mass index, waist circumference, body fat percentage and waist-to-height ratio) (Q4 vs Q1, p trends <0.001). In addition, those in Q4 (vs Q1) had lower diastolic BP, homeostatic model assessment for insulin resistance, fasting insulin and TAG, and higher high-density lipoprotein cholesterol (P trends <0.01). Compared to Q1, those in Q4 of the DASH score had lower total cholesterol (TC), while aMED was the only score not associated with low-density lipoprotein cholesterol (LDL-C) concentration. No relationships were observed between the DQS and systolic BP or fasting glucose concentration.

The study found that higher scores of HEI-2015, aMED, and DASH were associated with more favourable cardio-metabolic health outcomes in adults. Adhering to these diets may help prevent and/or delay the onset of CMD. Furthermore, better adherence to the DASH diet was associated with positive effects on TC levels, but randomised controlled trials are needed to confirm these observations.

Acknowledgments
Many thanks to my sponsor, the Ministry of National Education of the Republic of Turkey.

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