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Application of the Prime Diet Quality Score to the EPIC Food Frequency Questionnaire: baseline data from the Personalising Advice to improve Diet Quality (PAD-Q) trial

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The Prime Diet Quality Score (PDQS) is a rapid dietary screener that assesses diet quality. It has been associated with cardiovascular disease (CVD) in a US population⁽¹⁾ and validated in a UK/Irish population against 4-day food dairies⁽²⁾. Food Frequency Questionnaires (FFQ) are the most commonly used dietary assessment instrument in large epidemiological studies⁽³⁾. To reduce the burden of standard dietary assessment methodology, having a valid screener such as the PDQS that can be applied to FFQ data may be especially relevant to public health^(4,5). This study aimed to explore how the PDQS applied to EPIC FFQ data compares to the PDQS collected directly to assess diet quality in a population at risk of CVD on the Island of Ireland.

The PAD-Q trial is a six-month, parallel, randomised, controlled, single-blinded intervention study conducted at Queen's University Belfast and University College Dublin. Volunteers at risk of CVD by being overweight and either having hypertension, hypercholesterolaemia and/or smoking, and who had a low PDQS score (≤ 21) were recruited. PDQS provides a total score ranging 0–42 derived from the sum of intake level scores of 21 healthy and unhealthy food groups. To apply the PDQS to the FFQ data, the FFQ food items were matched to the most appropriate PDQS food group or left uncoded when no appropriate match could be made. Intakes from FFQ were calculated into an estimation of weekly portions to enable calculation of scores according to PDQS categories. Pearson correlation coefficients, ICCs and weighted kappa were used to analyse correlation and agreement between total PDQS scores, and Spearman correlation coefficients for individual PDQS food items. Comparison of scores from individual PDQS groups were analysed via Wilcoxon test, with p-values < 0.05 considered statistically significant.

In total, $n = 152$ participants completed baseline questionnaires. Mean age of participants was 49 years (SD: 12), 70% were female, 29.5% were classified with overweight and 70.5% with obesity. PDQS total score derived from FFQ data (15.0 (SD: 3.7)) was correlated ($r = 0.69$, $p < 0.01$) with PDQS total score at baseline (15.5 (SD: 4.2)). Similar association was observed via ICC (0.68 (95%CI: 0.58–0.76)). Weighted kappa indicated moderate agreement between measures (0.52 (SE: 0.05)). In the analysis of individual food group scores, correlation (r) ranged 0.32–0.68 ($p < 0.01$). PDQS applied to FFQ demonstrated higher scores for most (9/13) of the healthy PDQS food groups and lower scores for all the unhealthy PDQS food groups (7/7) compared to PDQS data.

Diet quality assessed via PDQS applied to FFQ data was significantly moderately correlated with diet quality assessed via PDQS at baseline in the PAD-Q trial. Results are comparable with dietary questionnaire validation studies. FFQ data higher estimated the intake of both healthy and unhealthy PDQS food groups compared to PDQS data.

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