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The impact of rotational shift work schedules on energy intake: a systematic review and meta-analysis

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Shift workers are known to have poorer metabolic health outcomes compared to day workers,[(1)] whilst those who work in rotating shift work roles have the highest risk.[(2)] To date, overall energy intake in shift workers has been found to be similar to day workers,[(3)] but it is unknown whether energy intake in workers on rotating shift schedules may be a contributing factor to the observed higher chronic disease risk. A systematic review and meta-analysis were conducted to explore how rotating shift work schedules impact total energy intake compared to fixed day/morning work schedules. Intra-person differences in energy intake amongst rotating shift workers on day/morning versus night shifts was also examined. Searches were conducted on CINAHL, Cochrane, Embase, MEDLINE, PsycINFO and Scopus databases to identify articles reporting energy intake for rotating shift workers and fixed day workers. Articles were screened in duplicate against inclusion criteria using Covidence software. Data were extracted by one reviewer and checked independently by one of three reviewers. Quality assessment of included studies was assessed in duplicate using the American Dietetic Association (ADA) Quality Criteria Checklist for Primary Research. Meta-analyses were performed in RevMan using a random effects model, to compare mean difference in 24-hour energy intake with 95% confidence intervals. Heterogeneity was assessed with the I-squared test (I^2). Thirty-one studies ($n = 18196$ participants) met the inclusion criteria and were included in the review, with data for the two meta-analyses comprising 18 studies and seven studies, respectively. Overall, rotating shift workers had significantly higher average 24-hour energy intake compared to fixed day or morning work schedules (weighted mean difference [WMD] = 264 kJ; 95% CI [70, 458], $p < 0.008$; $I^2 = 63\%$). Within rotating shift workers, the mean difference in 24-hour energy intake across morning/day shifts compared to night shifts was not statistically significant (WMD = 101 kJ; 95% CI [−651, 852]; $p = 0.79$; $I^2 = 77\%$). Results indicate workers on rotating shift schedules had a higher average 24-hour energy intake compared to their fixed day schedule counterparts. However, energy intake across shift schedules did not differ for individuals working this pattern. A higher 24-hour energy intake in rotating shift workers can contribute to gradual weight gain and higher metabolic risk in rotating shift work populations.

References

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