Social Jetlag Is Associated With Poor Diet and Increased Inflammation in the ZOE PREDICT 1 Cohort

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Objectives: Social jetlag is a habitual pattern of short sleep on work days relative to longer, often later, 'catch-up sleep', on work-free days. This chronic pattern of inconsistent sleep times has been associated with poor dietary choices and unfavourable body weight and cardiometabolic health outcomes. We explored associations between social jetlag with dietary intake, body composition, and cardio-metabolic health in the densely phenotyped PREDICT 1 cohort.

Methods: Participants ($n = 931$) who self-reported habitual sleep on week-days and weekend days, (males, $n = 258$ and females, $n = 673$, aged 18–65 years) were identified from the ZOE PREDICT 1 study, a multi-centre dietary intervention study of 1002 healthy UK individuals (NCT03479866). Demographic information (age, gender, education level, ethnicity, menopausal status), habitual diet (FFQ), cardiometabolic blood biomarkers and postprandial responses to standardized test meals in clinic and free-living settings were collected. Social jetlag was calculated as a difference of ≥ 1.5 h in sleep midpoint on week versus weekend days. Differences in diet and cardiometabolic risk factors were tested (analysis of covariance) adjusting for sex, age, BMI, ethnicity and socio-economic status.

Results: Only 3% (n = 26) of participants were short sleepers ($<$ 7 h), 25% (n = 237) were long sleepers ($>$ 9 h) and 16% (n = 145) had social jetlag. The social jetlag group had a higher proportion of males (39% vs 25%) and were younger (mean $\pm$ SD) (38.4 $\pm$ 11.3 y vs 46.8 $\pm$ 11.7 y). Social jetlag was associated with less healthy diets (healthy plant based dietary index) and lower intakes of fruits, nuts and number of plants consumed, as well as higher intakes of sugar-sweetened beverages (p $<$ 0.05 for all). Fasting concentrations of glycoprotein acetylation (GlycA), a composite marker of systemic inflammation, was slightly higher (1.35 $\pm$ 0.19 mmol/L *vs* 1.32 $\pm$ 0.18 mmol/L, p = 0.034) in participants with social jetlag.

Conclusions: Our findings support the complex relationship between sleep patterns, diet quality and markers of cardiometabolic health. Multi-factorial diet and lifestyle approaches are needed to improve health, now underpinned by emerging knowledge about the potential long-term impacts of modest circadian misalignments and low grade inflammation.