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The influence of chronotype on temporal patterns of eating and diet composition in shift and non-shift workers

Y.Y. Phoi[1], M.P. Bonham[2], M. Rogers[3], J. Dorrian[3] and A.M. Coates[1]
[1]*Allied Health & Human Performance, University of South Australia, Adelaide, 5001, Australia*
[2]*Nutrition, Dietetics & Food, Monash University, Melbourne, 3800, Australia*
[3]*Justice & Society, University of South Australia, Adelaide, 5072, Australia*

When and what you eat can be linked to circadian preference (i.e., chronotype) and occupation (e.g., shift worker). Evening chronotypes, with a later circadian preference, tend to have meals later, distribute energy intake toward the end of the day[(1)], and more unhealthy eating habits than morning chronotypes[(2)]; whereas night shift work is associated with later mealtimes and poor diet quality as a result of circadian disruption due to their work[(3)]. What is unclear is whether chronotype influences the occupation-induced dietary patterns observed in shift workers. This study aimed to investigate associations between chronotype, temporal patterns of eating and diet composition in shift and non-shift workers. Adults from shift (SW) and non-shift (N-SW) populations were recruited. A Chrononutrition Questionnaire captured chronotype, duration of eating window (DEW), time of first eating occasion (FEO) and last eating occasion (LEO) while diet composition (energy, protein, total fat, saturated fat, carbohydrate, fibre, alcohol) was extracted from 7-day food diaries. Associations between chronotype and DEW/FEO/LEO, and between DEW/FEO/LEO and diet composition were determined by Spearman Rank Coefficients. 95 participants were enrolled (N-SW: n = 39; SW: n = 56); predominantly female (71%), morning chronotype (37%), on average 40.46 ± 15.08 years with BMI of 27.04 ± 5.77kg/m^2. 84 returned food diaries. Later chronotype was positively associated with later times of FEO (N-SW: r = ,50, SW: r = ,69) and LEO (N-SW: r = ,63, SW: r = ,54) on free (non-work) days (p≤.002), and longer DEW (r = ,42) and later LEO (r = ,60) on workdays for non-shift workers (p<.01). However, there were no significant differences in diet composition by day/shift type between chronotypes across the study population. On afternoon shifts, longer DEW was associated with greater energy (r = ,60) and total fat intake (r = ,60) and later LEO with greater alcohol intake (r = ,59) (p<.05). On night shifts, a longer DEW was associated with lower alcohol intake (r=-.45, p<.05). Amongst non-shift workers, later FEO was associated with lower fibre intake on workdays (r=-.58, p<.001). Additionally, non-shift workers who were later chronotypes had later LEO, which on workdays associated with lower fibre (r=-.45) and alcohol intake (r=-.43); and on work-free days, associated with lower alcohol intake (r=-.45) (p<.05). Not surprisingly, evening chronotypes across the study population had longer and/or later eating windows on work-free days (i.e., free of constraints), as did non-shift workers on workdays, while the influence of chronotype on DEW, FEO, and LEO across shifts were less clear. Hence, for shift workers, occupation appeared to be a greater driver of temporal eating patterns than chronotype. Additionally, later eating times of evening chronotypes was not associated with negative diet composition. The exception was lower fibre intake amongst non-shift workers; but regardless of chronotype, shift workers may benefit from having a shorter and earlier DEW on afternoon shifts to minimise energy, fat, and alcohol intake.

Keywords: Chrononutrition; temporal eating patterns; chronotype; diet composition

Ethics Declaration

Yes

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