Proceedings of the Nutrition Society (2016), **75 (OCE1)**, E4 doi:10.1017/S0029665115004371

Winter Meeting, 8–9 December 2015, Roles of sleep and circadian rhythms in the origin and nutritional management of obesity and metabolic disease

Variation in sleep is associated with diagnosis of late-onset diabetes: a cross-sectional analysis of self-reported data from the first wave of 'Understanding Society' (the UK Household Longitudinal Study)

R.A. Alfawaz, G.R. Law, E.M. Scott and G.TH. Ellison

Temporal Influences on Metabolic Events (TIME) Research Group, The Sound Asleep Laboratory, Leeds Institute of Cardiovascular and Metabolic Medicine (LICAMM), School of Medicine, University of Leeds, Leeds LS2 9JT

The present study explored the relationship between diabetes and sleep using self-reported data on clinical diagnoses of late-onset (aged ⩾20yrs) diabetes and seven components of sleep from the first wave (2009–10) of the nationally representative UK Household Longitudinal Study (UKHLS); n = 29,452. This involved multinomial logistic regression before and after adjustment for potential confounders, and for body mass index (BMI) and hypertension.

Clinical diagnosis of diabetes (referent: no diagnosis) as predictor of seven sleep components.

	Model 1[a]		Model 2[b]		Model 3[c]	
Sleep component (referent)	RR	95 %CI	RR	95 %CI	RR	95 %CI
Sleep duration (⩾7hrs)						
<5hrs	3·00	2·42–3·70	1·71	1·35–2·15	1·37	1·08–1·73
5hrs to <6hrs	1·96	1·64–2·35	1·41	1·17–1·71	1·24	1·02–1·51
6hrs to <7hrs	1·33	1·17–1·52	1·13	0·99–1·30	1·06	0·92–1·22
Sleep latency (cannot get to sleep within 30 min; 'Not during the past month')						
'Less than once a week'	0·82	0·70–0·96	0·94	0·80–1·10	0·94	0·80–1·11
Once or twice a week'	0·94	0·80–1·11	1·04	0·88–1·24	1·01	0·84–1·20
'Three or more times a week'	1·29	1·12–1·49	1·23	1·05–1·43	1·09	0·93–1·27
Sleep disturbance ('Three or more times a week')						
'Not during the past month'	0·51	0·44–0·60	0·80	0·68–0·93	0·91	0·77–1·06
'Less than once a week'	0·48	0·40–0·57	0·76	0·63–0·91	0·86	0·72–1·04
'Once or twice a week'	0·57	0·49–067	0·74	0·63–0·87	0·81	0·68–0·95
Cough or snore loudly ('Not during the past month')						
'Less than once a week'	1·28	1·07–1·52	1·07	0·89–1·28	0·97	0·81–1·17
Once or twice a week'	1·60	1·33–1·94	1·15	0·95–1·40	0·94	0·77–1·14
'Three or more times a week'	2·69	2·36–3·07	1·60	1·39–1·84	1·18	1·02–1·37
Sleep medication ('Not during the past month')						
'Less than once a week'	0·57	0·40–0·81	0·72	0·50–1·03	0·75	0·52–1·09
Once or twice a week'	1·28	0·92–1·78	1·17	0·83–1·66	1·13	0·80–1·60
'Three or more times a week'	3·28	2·85–3·77	2·01	1·73–2·34	1·60	1·37–1·87
Sleep quality ('Fairly good')						
'Very good'	1·00	0·87–1·15	0·85	0·74–0·98	0·90	0·78–1·04
'Fairly bad'	1·14	0·98–1·32	1·17	1·00–1·37	1·05	0·89–1·23
'Very bad'	2·04	1·61–2·54	1·40	1·09–1·79	1·12	0·86–1·44
Trouble staying awake ('Not during the past month')						
'Less than once a week'	0·74	0·59–0·91	0·99	0·79–1·24	0·95	0·76–1·19
Once or twice a week'	1·24	0·97–1·59	1·34	1·03–1·74	1·21	0·92–1·58
'Three or more times a week'	2·12	1·53–2·92	1·52	1·07–2·15	1·23	0·86–1·75

[a]Unadjusted; [b]Adjusted for: sex, age, educational attainment, employment status, household structure[1] and marital status [c]Adjusted for: [b] and for body mass index and clinical diagnoses of high blood pressur

This is the largest study to-date to demonstrate a strong inverse association between late-onset diabetes and poor sleep, even after adjustment for potential confounding. It is also the first study to demonstrate that this association exists across a range of sleep components. However, because these findings stem from cross-sectional analyses of self-reported data for both the exposure and the outcome, further large-scale studies using longitudinal or experimental designs, and using objective measures of diabetes and/or sleep, are required to exclude the possibility that under-adjustment for latent confounders (particularly those associated with recall or reporting bias) are responsible for the association observed.

1. Fowler H, Ellison GTH, Scott EL, Law GR. (2014) The importance of household composition in epidemiological analyses of sleep: Evidence from the Understanding Society longitudinal panel survey. *Open J Epidemiol* **4**, 45–64. doi:10.4236/ojepi.2014.41009