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P058

ASSOCIATIONS BETWEEN SLEEP PARAMETERS, NON-COMMUNICABLE DISEASES, HIV STATUS AND MEDICATIONS IN OLDER, RURAL SOUTH AFRICANS

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Abstract P058 Table 1 Logistic regression models for association between demographic and sleep variables. Each of the six sleep parameters (dependent variables) was evaluated in a separate model with the demographic variables serving as independent variables

		Self-reported sleep duration	Bedtime	Wake time	Insufficient sleep	Restless sleep	Snoring
		Quartile 1 - Quartile 4	Quartile 1 - Quartile 4	Quartile 1 - Quartile 4	Sometimes/ Rarely/ Never sufficient vs. Often/ Very often sufficient	Yes vs. No	Yes vs. No
		OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Age group (y)	50-59 vs 40-49	0.83 (0.70, 0.98)	1.00 (0.85, 1.17)	0.76 (0.64, 0.89)	1.13 (0.93, 1.37)	1.39 (1.12, 1.72)	1.28 (1.00, 1.63)
	60-69 vs 40-49	0.78 (0.65, 0.94)	0.99 (0.83, 1.19)	0.61 (0.51, 0.73)	1.04 (0.84, 1.29)	1.79 (1.42, 2.25)	1.64 (1.26, 2.13)
	70-79 vs 40-49	0.93 (0.76, 1.15)	0.75 (0.61, 0.92)	0.85 (0.69, 1.04)	1.15 (0.91, 1.47)	1.97 (1.53, 2.54)	1.54 (1.14, 2.07)
	80+ vs 40-49	1.24 (0.97, 1.59)	0.53 (0.41, 0.67)	1.18 (0.93, 1.51)	1.37 (1.04, 1.81)	2.46 (1.84, 3.29)	1.80 (1.27, 2.55)
Sex	Female vs Male	0.73 (0.64, 0.83)	0.93 (0.82, 1.05)	0.50 (0.44, 0.57)	1.05 (0.91, 1.21)	1.28 (1.10, 1.49)	0.74 (0.62, 0.88)
BMI	Underweight vs normal	1.01 (0.79, 1.30)	0.71 (0.55, 0.90)	1.06 (0.83, 1.35)	1.09 (0.82, 1.44)	1.27 (0.95, 1.69)	1.34 (0.94, 1.89)
	Overweight vs normal	1.03 (0.90, 1.19)	0.97 (0.84, 1.11)	0.91 (0.79, 1.04)	1.14 (0.97, 1.33)	1.14 (0.97, 1.34)	1.30 (1.07, 1.60)
	Obese vs normal	1.08 (0.93, 1.24)	1.06 (0.92, 1.22)	1.10 (0.95, 1.26)	1.30 (1.11, 1.53)	1.02 (0.86, 1.20)	2.50 (2.05, 3.05)
Education	1-7 years vs No formal education	0.89 (0.78, 1.02)	1.19 (1.05, 1.35)	1.02 (0.9, 1.16)	0.93 (0.81, 1.08)	0.94 (0.81, 1.09)	1.29 (1.08, 1.53)
	8-11 years vs No formal education	0.96 (0.79, 1.16)	1.18 (0.97, 1.43)	1.17 (0.97, 1.42)	0.67 (0.53, 0.85)	0.82 (0.64, 1.04)	1.09 (0.83, 1.44)
	12+ years vs No formal education	0.82 (0.64, 1.03)	1.45 (1.15, 1.83)	0.81 (0.64, 1.02)	0.71 (0.54, 0.94)	0.50 (0.36, 0.70)	1.23 (0.89, 1.70)
Employment	Employed vs Not working	0.57 (0.48, 0.67)	1.00 (0.86, 1.18)	0.43 (0.36, 0.50)	0.94 (0.78, 1.13)	0.76 (0.62, 0.94)	0.99 (0.79, 1.24)
	Homemaker vs Not working	0.45 (0.37, 0.54)	0.88 (0.74, 1.05)	0.96 (0.80, 1.14)	0.34 (0.27, 0.43)	0.86 (0.70, 1.06)	1.20 (0.95, 1.52)
Marital status	Never married vs Currently married	1.18 (0.92, 1.51)	0.95 (0.75, 1.20)	1.57 (1.24, 1.99)	1.10 (0.84, 1.46)	1.14 (0.83, 1.56)	0.82 (0.57, 1.17)
	Separated / divorced vs Currently married	1.20 (1.01, 1.43)	0.85 (0.71, 1.00)	1.35 (1.13, 1.59)	1.15 (0.94, 1.40)	1.38 (1.12, 1.69)	0.76 (0.59, 0.97)
	Widowed vs Currently married	1.23 (1.07, 1.42)	0.79 (0.69, 0.91)	1.20 (1.04, 1.38)	1.13 (0.96, 1.33)	1.33 (1.13, 1.57)	0.66 (0.54, 0.81)
Wealth quintile	2 vs 1 (lowest)	0.94 (0.79, 1.11)	1.21 (1.03, 1.44)	0.92 (0.77, 1.08)	1.11 (0.92, 1.35)	0.91 (0.75, 1.11)	0.86 (0.68, 1.10)
	3 vs 1	0.81 (0.68, 0.97)	1.31 (1.11, 1.56)	0.90 (0.76, 1.07)	0.93 (0.76, 1.14)	1.09 (0.89, 1.33)	0.93 (0.73, 1.18)
	4 vs 1	0.73 (0.61, 0.87)	1.66 (1.40, 1.97)	0.99 (0.83, 1.18)	1.03 (0.84, 1.26)	1.05 (0.85, 1.29)	0.92 (0.72, 1.18)
	5 vs 1	0.76 (0.63, 0.92)	1.83 (1.52, 2.19)	0.99 (0.83, 1.19)	1.05 (0.85, 1.30)	0.89 (0.72, 1.11)	0.88 (0.68, 1.14)

OR: odds ratio, CI: confidence interval, BMI: body mass index.

Abstracts

Abstract P058 Table 2 Logistic regression models for associations between sleep parameters and health conditions. Each of the six health conditions (dependent variables) was evaluated in separate model for each off the 11 sleep variables (independent variables), adjusted for BMI category and demographic characteristics (age group, sex, education group, employment status, marital status, wealth index quintile). The obesity outcome was not adjusted for BMI.

		Obesity OR (95% CI)	Hypertension OR (95% CI)	Dyslipidemia OR (95% CI)	Diabetes OR (95% CI)	Anemia OR (95% CI)	HIV OR (95% CI)
(1) Self-reported sleep duration	Quartile 1 (4-7h) vs 2 (8h)	0.97 (0.82, 1.17)	1.18 (1.00, 1.39)	0.94 (0.79, 1.12)	1.12 (0.86, 1.47)	1.26 (1.01, 1.58)	1.05 (0.86, 1.29)
	Quartile 3 (9h) vs 2 (8h)	1.06 (0.87, 1.30)	1.12 (0.93, 1.35)	0.99 (0.82, 1.20)	1.02 (0.75, 1.38)	1.19 (0.92, 1.52)	1.19 (0.95, 1.49)
	Quartile 4 (10-14h) vs 2 (8h)	1.07 (0.86, 1.33)	0.84 (0.69, 1.03)	0.88 (0.72, 1.09)	1.31 (0.96, 1.79)	1.43 (1.10, 1.86)	1.08 (0.84, 1.38)
(2) Bedtime	Quartile 2 (8-9pm) vs 1 (<8pm)	1.22 (0.96, 1.55)	1.15 (0.94, 1.42)	0.94 (0.75, 1.17)	1.01 (0.72, 1.40)	0.96 (0.73, 1.26)	1.35 (1.03, 1.76)
	Quartile 3 (9-9:30pm) vs 1 (<8pm)	1.36 (1.07, 1.73)	1.26 (1.02, 1.56)	1.10 (0.88, 1.37)	0.80 (0.57, 1.12)	0.99 (0.75, 1.30)	1.21 (0.93, 1.58)
	Quartile 4 (>9:30pm) vs 1 (<8pm)	1.24 (0.96, 1.60)	1.11 (0.89, 1.39)	0.96 (0.76, 1.22)	0.68 (0.47, 0.99)	0.96 (0.71, 1.28)	1.14 (0.86, 1.52)
(3) Wake time	Quartile 2 (5am) vs 1 (<5am)	1.15 (0.95, 1.40)	0.81 (0.68, 0.98)	1.01 (0.83, 1.22)	1.22 (0.91, 1.64)	0.95 (0.75, 1.21)	0.92 (0.74, 1.15)
	Quartile 3 (>5-6am) vs 1 (<5am)	1.27 (1.04, 1.55)	0.98 (0.81, 1.18)	1.07 (0.88, 1.30)	1.05 (0.77, 1.43)	1.00 (0.79, 1.28)	1.14 (0.91, 1.42)
	Quartile 4 (>6am) vs 1 (<5am)	1.23 (0.97, 1.57)	0.96 (0.77, 1.19)	1.02 (0.81, 1.27)	1.36 (0.96, 1.93)	1.14 (0.85, 1.51)	0.99 (0.75, 1.29)
(4) Sleep quality	Bad vs good	0.82 (0.61, 1.11)	1.43 (1.08, 1.90)	1.28 (0.98, 1.68)	1.08 (0.72, 1.64)	1.33 (0.96, 1.84)	0.76 (0.53, 1.09)
(5) Latency >30 min	At least once/week vs <once/week	0.97 (0.84, 1.12)	1.08 (0.94, 1.23)	1.01 (0.88, 1.16)	1.10 (0.89, 1.36)	1.09 (0.91, 1.30)	0.93 (0.78, 1.09)
(6) Insufficient sleep	Sometimes/rarely/never sufficient vs often/very often sufficient	1.21 (1.05, 1.40)	1.10 (0.96, 1.26)	1.16 (1.01, 1.33)	0.89 (0.72, 1.10)	1.05 (0.88, 1.25)	0.93 (0.79, 1.09)
(7) Restless sleep	Yes vs no	0.95 (0.82, 1.10)	1.19 (1.04, 1.37)	1.06 (0.92, 1.22)	1.29 (1.05, 1.60)	1.04 (0.87, 1.25)	0.86 (0.72, 1.02)
(8) Nocturnal awakenings	At least once/week vs <once/week	0.96 (0.84, 1.10)	1.12 (0.98, 1.27)	0.97 (0.85, 1.10)	1.02 (0.83, 1.25)	0.99 (0.84, 1.18)	1.09 (0.93, 1.27)
(9) Snoring	Yes vs no	2.18 (1.85, 2.57)	1.15 (0.98, 1.35)	0.97 (0.82, 1.14)	1.41 (1.12, 1.78)	0.82 (0.65, 1.02)	0.89 (0.72, 1.09)
(10) Gasping	Yes vs no	2.13 (1.75, 2.59)	1.07 (0.88, 1.30)	0.93 (0.76, 1.13)	1.27 (0.97, 1.67)	0.90 (0.69, 1.18)	1.05 (0.82, 1.34)
(11) Breathing stops	Yes vs no	1.77 (1.37, 2.30)	1.42 (1.09, 1.85)	0.94 (0.72, 1.21)	1.29 (0.91, 1.83)	1.10 (0.79, 1.53)	0.85 (0.60, 1.20)

OR: odds ratio, CI: confidence interval, BMI: body mass index.

Introduction Sleep interacts with both infectious diseases and NCDs, but is a frequently neglected aspect of health and well-being. In South Africa, both NCD and HIV are highly prevalent, making the study of the association of sleep disorders with this double epidemic an imperative.

Methods We investigated sleep habits and their interactions with HIV and NCDs in 5059 individuals 40 years and above from the study 'Health and Aging in Africa: a Longitudinal Study of an INDEPTH community' in Agincourt, South Africa. We collected sociodemographic data, anthropometric measurements, and blood pressure, and tested for glucose, haemoglobin and HIV. Major individual components of the Pittsburgh Sleep Quality index (PSQI) questionnaire were analysed, in addition to other questions on health and well-being. Sex comparisons were carried out using an independent t-test,

a Mann-Whitney U test or a Fisher's Exact test. The association of demographic variables and sleep parameters were measured using logistic regression.

Results Self-reported sleep duration was 8.2 ± 1.6 h. Insufficient sleep associated with age, education, unemployment, and obesity. Restless sleep associated with age, education, unemployment, and being female and single table 1. Obesity associated with self-reported bedtime, wake time, insufficient sleep, snoring/gasping/periods of stopping breathing during sleep. Hypertension associated with shorter sleep duration, poor sleep quality, restless sleep, and sleep apnoea symptoms. Diabetes associated with bedtime, restless sleep, and snoring table 2. HIV+ individuals not on anti-retroviral therapy (ART) reported more nocturnal awakenings than those on ART ($p=0.029$) and HIV- individuals ($p=0.024$).

Discussion These data provide a basis for further studies of the relationship between sleep and other risk factors. It also provides valuable data about sleep habits in Africa, with potential for future analysis of how it is affected by urbanisation and industrialisation. Finally, it offers a unique opportunity for a population-based comparison of the effects of treated and untreated HIV infection, increasingly unavailable elsewhere.

P059 ADHERENCE TO WAKEFULNESS PROMOTING MEDICATION IN PATIENTS WITH NARCOLEPSY

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Introduction Excessive daytime sleepiness (EDS) is disabling and it's control is usually contingent on ongoing pharmacological therapy including: modafinil, methylphenidate, dexamphetamine, pitolisant, and sodium oxybate. Irrespective of the medication used, all pharmacological options must be taken to have an effect and while assessment of treatment adherence is standard clinical practice in many chronic conditions, in sleep medicine, evidence regarding adherence to prescribed medications is strikingly limited.

The aim of this study was to assess degree and predictors of adherence to prescribed treatment in patients with narcolepsy attending a tertiary Sleep Disorders Centre.

Methods We examined adherence to treatment in consecutive adult patients with a final diagnosis of narcolepsy by comparing prescription collection rates with prescribed therapy over a one-year period. Three levels of adherence were defined depending on the medication supplied in the last year in

proportion to the total prescribed: poor ($\leq 50\%$), intermediate ($51-79\%$), and good ($\geq 80\%$) adherence. Patients with adherence $<80\%$ were considered as sub-optimally adherent.

Results Demographic and clinical characteristics 162 patients were identified, from which 123 subjects with accurate information regarding current treatment regimen and adherence were included (see table 1). Good adherence was seen in 52.8% of patients, whilst 12.2% were intermediately and 35% poorly adherent. No difference was seen in proportion of good adherence between patients with refractory vs non-refractory symptoms (41.5% vs 58.5%; $p=0.68$). The proportion of refractory patients with suboptimal adherence was 44.9%. Patients with NT1 were less likely than those with NT2 to have suboptimal adherence (40.4% vs 75%; $p=0.002$).

Discussion Our findings suggest that poor adherence is observed in a high proportion of patients with narcolepsy, and that a diagnosis of NT2 seems to be associated with non-adherence to prescribed treatment. Adherence to treatment should be routinely assessed in narcolepsy, particularly prior to initiating any step-up in therapy.

P060 CO-MORBIDITY OF DELAYED SLEEP PHASE AND PSYCHIATRIC CONDITIONS IN A COHORT OF ADOLESCENTS

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Introduction Delayed Sleep Phase (DSP) is an extremely common sleep problem during adolescence. It is typically manifested as frequently occurring late bedtimes and difficulties waking up. The prevalence in entire populations is estimated to be over 15%. While it is common in typically developing teenagers (estimates ranging from 15%-50%), its prevalence may be even higher in those suffering from psychiatric conditions such as severe depression or anxiety.

Methods We studied a cohort sample ($n=295$) of 17-year-olds (70% girls) in order to detect co-morbidity of DSP and several psychiatric disorders. For sleep measurements we used actigraphy (GeneActiv Original) for a minimum of 7 days as well as the Pittsburgh Sleep Quality Index. These served as tools for estimating a tendency towards DSP, which was defined as having a bedtime later than 1 AM for more than three times per week. Psychiatric disorders (major depressive disorder, generalized anxiety disorder, hypo-manic disorders, obsessive-compulsive disorder, psychotic disorders, and eating disorders) were evaluated using a validated MINI structured interview.

Results The overall prevalence of DSP was 50% in our sample of adolescents. There were no differences between girls and boys in the prevalence of DSP ($p=0.24$). DSP was significantly higher in those with major depressive disorder ($p=0.018$), generalized anxiety disorder ($p=0.025$), and almost significant for obsessive-compulsive disorder ($p=0.055$). DSP was not more prevalent in hypo-manic disorders, psychotic disorders, or any eating disorders (all p -values >0.3).

Discussion We found a significant co-morbidity between DSP and several psychiatric disorders. This suggests that there is an added burden of sleep problems in those with issues relating to mental well-being. As our study population is from a

Abstract P059 Table 1 patient characteristics

	N = 123
Age	39.4 (± 13.9)
Female sex	69 (56.1%)
Diagnosis	
Narcolepsy type 1	99 (80.5%)
Narcolepsy type 2	24 (19.5%)
Psychiatric comorbidities	28 (22.8%)
Refractory sleepiness	49 (39.8%)
Number of wakefulness-promoting medications at last visit	
0	7 (5.7%)
1	67 (54.5%)
2	34 (27.6%)
3	13 (10.6%)
4	2 (1.2%)
Patients on	
Modafinil	57 (46.3%)
Methylphenidate XL	34 (27.6%)
Methylphenidate IR	16 (13%)
Dexamphetamine	25 (20.3%)
Sodium Oxybate	38 (30.9%)
Adherence	
Good ($\geq 80\%$)	65 (52.8%)
Intermediate (51-79%)	15 (12.2%)
Poor ($\leq 50\%$)	43 (35%)