Sleep in Aotearoa 2023

Abstracts

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Later school start times and sleep: adolescents' perspectives

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Aims*:* Current school start times constrain adolescents' sleep opportunity by not accommodating the change in their sleep-wake biology during puberty that favours a shift to later bed and wake times. Starting school later in the morning is one intervention that accommodates this, but is a topic of much debate within and outside of school communities. The views of students are currently underrepresented and fundamentally important. This study aimed to explore the perspectives of students with first-hand experience of later school start times in Aotearoa.

Methods*:* The study used purposive sampling to recruit year 12 and 13 students with and without regular later starts. Semi-structured Zoom interviews were conducted with 14 senior students from the same school, 8 with a regular late start (9:45am) and 6 without (8:45am). Both groups started at 10:30 am one day a week. Students completed the PROMIS sleep-related impairment and disturbance scales. Interviews were thematically analysed using principles outlined by Braun & Clarke (2006).

Results*:* Half of the participants took >30 minutes to fall asleep. Nine (64%) reported moderate or severe sleep disturbance, whereas 11 (78%) reported moderate or severe sleep–related impairment. Five themes were identified: sleep timing, consequences of sleep loss, student autonomy, and routines and scheduling. Most students reported later school starts as positively influencing their sleep quality, concentration, productivity, and personal wellbeing. The importance of student autonomy over their learning and schedules was also emphasised. The main disadvantages perceived were lack of free periods during the day and the potential for later finishing.

Conclusion*:* These interviews highlight the experiences of later school start times for adolescents as being largely positive across a variety of life domains, and the importance of sleep health for their wellbeing. Findings support the need for sleep health to be considered within school's health education and policy.

The authors have no conflicts of interest to declare.

Validation of Apnealink for home screening of sleep disordered breathing in pregnant women during early gestation.

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Aims: The detection of sleep disordered breathing (SDB) in pregnant women is logistically difficult. Reliable alternates to polysomnography (PSG) haven't been well validated in early pregnancy. We compared the agreement between Apnealink Air and PSG in pregnant women ≤ 24 weeks gestation.

Methods: Women were recruited to undergo Apnealink Air (AL) at home and attended PSG at less than 24 weeks gestation. Both tests were completed within 1 week where possible. The PSGs were scored by a single experienced scorer and AL automatically (AL_{auto}) and manually (AL_{manual}) scored (same scorer, blinded to PSG). An apnoea hypopnea index (AHI) ≥ 5 at PSG was considered diagnostic of SDB. Diagnostic analysis was undertaken (sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV)) by creating receiver operating characteristic (ROC) curves. The calculated AHI of each method was compared and Bland-Altman plot used to determine agreement.

Results: Forty-nine patients were included, mean age 34.84±5.41, median gestation at PSG 14.0(12.9, 17.1) weeks and BMI 32.19±7.16. Five (13.2%) women had SDB. Median AHI for AL_{auto} and AL_{manual} did not differ from PSG: PSG:1.7 (1.0, 6.1), AL_{auto} :3.1 (0.85, 4.6);p=0.55 and AL_{manual}:2.4(0.65, 4.8);p=0.54 respectively. AL_{auto} and AL_{manual} compared to PSG demonstrated similar diagnostic test accuracy (area under the ROC curve 0.94 (95%CI 0.87-1.0) and 0.92 (95%CI 0.85-1.0)) respectively. Sensitivities between ALauto and AL_{manual} compared to PSG were similar (64.3% and 64.3% respectively) and specificities were 94.3% and 91.4% respectively. PPV and NPV for both the AL_{auto} and AL_{manual} were 81.8% and 86.8% respectively. Bland-Altman plots demonstrated AL_{auto} and $AL_{manual,}$ (upper and lower confidence intervals 23.39, -19.70 and 23.81, -19.55) at lower and higher AHI scores tended to slightly overestimate and underestimate severity, respectively.

Conclusion: Apnealink Air, using manual and automatic scoring, provided a substitute to PSG in the identification of SDB in early gestation in this small sample.

There were no conflict of interest declared from the authors.

Exploring the role of mediators between sleep and risky/inattentive driving in NZ teens

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Aims: Sleep issues (e.g., insomnia, insufficient sleep, daytime sleepiness) can increase the risk of road crashes, as can factors such as inattention, sluggish cognitive tempo (SCT), and sensation seeking (SS).

Methods: We conducted an online survey study to explore the relationship between these factors and risky and inattentive driving in a sample of teens aged 16-18 years (*N*=191). Specifically, we investigated whether SS, inattention, and/or daytime sleepiness mediated the relationship between sleep and risky driving, and whether inattention, daytime sleepiness, and/or SCT mediated the relationship between sleep and inattentive driving. We hypothesized that: (1) severity of sleep issues would be associated with greater daytime sleepiness, SCT, and inattention, whereas it would be inversely associated to SS propensities, and that (2) SS, inattention, and daytime sleepiness would be associated to risky driving, whereas inattention, daytime sleepiness, SCT would be associated to inattentive driving. We tested these associations in moderated-mediation models with both risky driving and inattentive driving as outcome variables.

Results: As hypothesised, those who reported more severe sleep issues also reported significantly higher levels of daytime sleepiness, inattention, SCT, and significantly lower levels of SS, and there was positively graded relationship between sleep issue severity and risky/inattentive driving. We found that SS and inattention mediated the relationship between sleep and risky driving, and that SCT and inattention mediated the relationship between sleep and inattentive driving. Surprisingly, daytime sleepiness did not statistically predict either driving outcome.

Conclusions: Our results demonstrate the influence of SS and inattention in the relationship between sleep and risky driving and SCT and inattentive in the relationship between sleep and inattentive driving in teens. Further, subgroup analyses comparing between genders indicated these factors disproportionately affect males experiencing insomnia. This suggests that inattention, sensation seeking, SCT may be risk factors for road crashes, and targeted sleep interventions may mitigate these risks.

No authors have a conflict of interest.

Prostate cancer and sleep: relationship with quality of life

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Aims: Prostate cancer (PCa) patients commonly experience insomnia symptoms as a result of psychological distress and/or side effects of treatment. In this study, we aim to investigate how sleep is affected by PCa treatment, and whether the impacts on sleep are also related to other quality of life measures in a New Zealand population. Data from this research will help clinicians educate patients about treatment side effects, and be used to develop interventions to improve patients' sleep.

Methods: 47 participants (25 men without PCa, 22 men with PCa), aged between 55 and 75, completed a series of questionnaires covering subjective sleep quality, sleep apnoea risk, fatigue, depression, anxiety, and sexual function. Participants were recruited through local newspaper advisements, PCa support groups, community posters, and Facebook. Recruitment was conducted in both Dunedin and Wellington from May to December in 2022.

Results: We found that insomnia symptoms and risk for sleep apnoea were comparable between men with and without PCa. However, men with PCa scored significantly higher compared to men without PCa in the questionnaires for: fatigue (mean ± SD, 2.0 ± 1.5 vs. 1.0 ± 1.1, $P < 0.05$), depressive symptoms (6.4 ± 3.4 vs. 3.8 ± 3.7, $P < 0.05$), and anxiety symptoms (2.9 ± 2.2 vs. 1.8 ± 2.3, $P < 0.01$). Men with PCa also reported experiencing more significant sexual bother than men without PCa (77.3 ± 30.8 vs. 88.0 ± 23.0, $P < 0.05$). Furthermore, increased insomnia symptoms correlated with fatigue, anxiety and depressive symptoms (all $P < 0.01$).

Conclusion: Results from this study point towards PCa patients having worsened quality of life measures, and outline relationships between insomnia severity and psychological wellbeing indicators. However, a larger sample size and/or further studies should be conducted to corroborate these findings and to determine the underlying causes of these relationships.

All authors declare that they have no conflicts of interest.

Social and cultural practices of sleep in Aotearoa New Zealand: A scoping review

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Aims: Sleep science is conventionally grounded in biology, physiology, and medicine. However, sleep practices are also embedded in social and cultural norms. Sociological perspectives are important for understanding, representing, and supporting the sleep of diverse populations as well as providing a lens for interpreting the nuances of modern society. The aim of this study was to understand the nature, extent, and characteristics of literature concerning sleep as a social or cultural practice among people living in Aotearoa New Zealand (AoNZ).

Methods: A scoping review will map the relevant academic sleep literature and identify that which specifically considers sleep as a cultural or social practice. The search terms zealand* OR aotearoa* AND sleep* AND cultural* OR social* OR practice were used in Discover (MEDLINE, APA PsycINFO, CINAHL) and Scopus. Initial exclusion criteria include duplicate files and manuscripts that do not concern human sleep or the AoNZ population. Findings will be illustrated thematically. Literature meeting criteria for describing social and/or cultural practices of sleep will be charted and descriptively analysed.

Results: The initial search yield provided 2,442 results. Excluding duplicates, 1,145 are being considered. Preliminary results indicate that sleep research in AoNZ has predominantly focused on the identification of the prevalence of sleep problems, risk factors and outcomes of aytpical sleep, as well as ethnic disparities in sleep status. Variation has been documented with regards to sleep norms, beliefs, perceptions of sleep problems, and strategies to manage sleep. For example, with ageing or cultural identity. However, there is a lack of cohesive literature considering sleep from a social science perspective.

Conclusions: This review highlights gaps in the field of local sleep research. This is foundational to a larger research agenda aiming to represent sleep-related discourses and practices in contemporary AoNZ society to ultimately expand, refine, and challenge existing theoretical perspectives.

The authors have no conflicts of interest to declare.

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Development of the Perception of Infant and Toddler Sleep Scale (PoITSS) for whānau (families) with pēpi (infants) in Aotearoa New Zealand.

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Aims: Children's sleep duration and night wakings are often reported as outcomes and compared to prescriptive sleep standards, yet children's sleep is influenced by a broad range of environmental, social, familial and cultural factors. There is an increasing understanding of "caregiver perception of children's sleep" as an important dimension of children's sleep health which can transcend these factors and be suitable for use in demographically diverse populations. The aim of the current work was to develop a scale to measure caregiver perception of young children's sleep in Aotearoa New Zealand families.

Methods: Three items ("do you consider the sleep of your pēpi (baby) to be a problem?"; "please rate how well your pēpi usually sleeps at night"; "how satisfied are you with the way you settle your pēpi to sleep at night?") were included within an online sleep and wellbeing survey for New Zealand caregivers of 0-2 year olds. Caregivers were asked if they found these questions difficult to respond to. Answers to each item were combined to create an overall score. Correlations with several established dimensions of sleep health were estimated.

Results: 957 caregivers completed the survey (35% Māori). The three items formed a 'Perception of Infant and Toddler Sleep Scale' (PoITSS) score on a scale from 0 (very poor) to 1 (very good) (Cronbach's alpha=0.80). The mean score was 0.69 (SD 0.23). Higher PoITSS scores were correlated with shorter sleep latency, fewer night wakings, and longer longest sleep periods, but correlations with longer sleep duration were weak. Findings were similar between ethnic groups. Only 14% of caregivers found the questions difficult to answer.

Conclusions: Caregiver perception of children's sleep can be measured in diverse families in Aotearoa using the PoITSS, providing a holistic measure of children's sleep that may be more useful than prescriptive sleep duration.

The authors do not have any conflicts of interest to declare.

A pilot evaluation of a telehealth-delivered intervention for improving the sleep of autistic children

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Aims*:* Sleep problems are common among autistic children, and can have significant adverse effects on wellbeing and quality of life. Traditionally, interventions are delivered individually in face-to-face clinical contexts resulting in numerous barriers to access. This study used a single-case multiple baseline across participants design to evaluate the feasibility, effectiveness, and acceptability of a telehealth-delivered sleep program (TDSP) for parents of autistic children.

Methods*:* Participants were seven autistic children (4-8 years) with parent-reported sleep problems and their parents. Intervention was delivered over 12 weeks and consisted of three sequential phases (4 weeks/phase): (1) self-directed parent psychoeducation delivered via a digital platform developed by the research team (the Good Nights Programme); 2) small group parent coaching via videoconferencing, and 3) individualized parent coaching via videoconferencing. Feasibility was assessed Sleep outcomes were assessed using daily parent-reported sleep diaries and the Child Sleep Habits Questionnaire (CSHQ). Acceptability was assessed using The Treatment Acceptability Rating Form Revised (TARF-R) and post-intervention interview with parents.

Results*:* All parents accessed the digital platform and participated in at least 75% of the group and/or individualized coaching sessions. All children demonstrated some reduction in sleep problems during phase one of the program, and the addition of group and individualized coaching contributed to further gains for all participants. Additionally, parents reported reduced bedtime resistance, bedtime anxieties, daytime sleepiness, increased total sleep time, and overall better sleep quality for their children, on the CSHQ. These improvements were maintained for 6/7 participants 12 weeks and six months post-intervention. All parents rated the program as acceptable.

Conclusion*:* TDSPs can offer a feasible, effective, and socially acceptable method to address sleep difficulties in autistic children. Replication and extension of these research findings can inform future design of digital sleep supports and will continue to add to the growing corpus of evidence.

On behalf of all authors, the corresponding author states that there is no conflict of interest.

Effects of activity breaks in the evening on subsequent sleep and physical activity in healthy adults: a randomized crossover trial.

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Aims: To determine the effect of regularly performing resistance activity breaks compared to prolonged sitting in the evening in a laboratory setting on subsequent free-living sleep quantity and quality and 24-hour physical activity.

Methods: In this randomized crossover trial, 28 participants (20 female, 8 male), age 25.6 ± 5.6 years, BMI 29.5 ± 6.7 kg/m^2 (mean ± SD) each completed two 4-hour laboratory-based interventions commencing at ~1700h: 1) prolonged sitting and 2) sitting interrupted with 3 min of bodyweight resistance exercise activity breaks every 30 min. Upon completion, participants returned to a free-living setting. Subsequent 24-hour sleep and physical activity were monitored via wrist-worn ActiGraph GT3+ accelerometry and a sleep and wear-time diary.

Results: Compared to prolonged sitting, mean sleep duration and time spent asleep were 29.3 min (95% CI 1.3 to 57.2, p=0.040) and 27.7 min (95% CI 2.3 to 52.4, p=0.330) longer, respectively, on the night following the regular activity breaks intervention. Compared to prolonged sitting, mean sleep efficiency, wake after sleep onset, and number of awakenings were not statistically different [0.2% (95% CI –2.0 to 2.4, p=0.857), 1.0 min (95% CI -9.6 to 11.7, p=0.849) and 0.8 times (95% CI -1.8 to 3.3, p=0.550) greater, respectively] following the regular activity breaks intervention. There were no statistically significant differences in subsequent 24-hour physical activity patterns between each intervention. However, compared to prolonged sitting, total physical activity was 18.3 min less (95% CI -50.3 to 13.8, p=0.265) in the 24-hours following the regular activity breaks intervention.

Conclusions: Performing bodyweight resistance exercise activity breaks in the evening has the potential to improve sleep duration but does not impact other aspects of sleep quality or subsequent 24-h physical activity. Future research should explore the impact of evening activity breaks on sleep over a longer period of time.

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Risk factors for sleepiness while driving and sleep-related accidents in a clinical population referred for suspected obstructive sleep apnoea (OSA)

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Aim: Waka-Kotahi recommend restricting driving in individuals with OSA and excessive daytime sleepiness (EDS), and with EDS and a history of a sleep-related accident. The aim of this study was to explore risk factors associated with sleepiness while driving and sleep-related accidents in a population referred for OSA. We hypothesize that sleepiness while driving and sleep-related accidents are interrelated, and each are associated with typical features of OSA.

Methods: All clinical referrals (2017-2022) accepted through the Waitaha sleep pathway were reviewed. The proposed risk factors for sleepiness while driving and sleep-related accidents included: gender, age, BMI, EDS (expressed by ESS), ODI, occupational driving and operating heavy machinery. Chi-Square test was used for comparison of percentages. Using multiple logistic regression models, odd ratios of each determinant for sleepiness while driving and sleep related accidents were estimated while controlling other confounders. $P < 0.05$ was regarded as statistically significant.

Results: Data from 9861 sleep assessments were analysed (39% females, mean age 49 ± 15 years, BMI 34.0 ± 8.1 kg/m^2, ODI 16.6 ± 20.9 and ESS of 12 ± 5). In this population, 27% reported sleepiness while driving and 8% reported a sleep-related accident, 24% were occupational drivers and 16% operate heavy machinery. Risk stratification based on occupation was 5%-high, 6%-moderate and 88%-low. ESS and ODI did not differ between these risk stratification groups.

The analysis of risk factors is tabulated below.

	Sleepy driving			Odd ratio	Sleep related accident			Odd ratio
	Yes	No	P	(95% CI)	Yes	No	p	(95% CI)
Male	1694 (28%)	4340 (72%)			593 (10%)	5441 (90%)		
Female	947 (25%)	2880 (75%)	**0.0003**	1.30 (1.17 – 1.44)	238 (6%)	3589 (94%)	**<0.0001**	1.52 (1.28 – 1.80)
Age > 40	1801 (26%)	5216 (74%)			586 (8%)	6431 (92%)		
Age ≤ 40	840 (30%)	2004 (70%)	**<0.0001**	0.88 (0.80 – 0.98)	245 (9%)	2599 (91%)	0.689	1.05 (0.90 – 1.24)
BMI > 30	1692 (28%)	4424 (72%)			523 (9%)	5593 (91%)		
BMI ≤ 30	821 (25%)	2422 (75%)	**0.015**	1.05 (0.95 – 1.16)	272 (8%)	2971 (92%)	0.815	0.99 (0.85 – 1.16)
ESS ≥ 13	1817 (40%)	2729 (60%)			513 (11%)	4033 (89%)		
ESS ≤ 12	824 (15%)	4491 (85%)	**<0.0001**	3.63 (3.30 – 4.00)	318 (6%)	4997 (94%)	**<0.0001**	1.34 (1.14 – 1.56)
ODI > 30	564 (32%)	1178 (68%)			176 (10%)	1566 (90%)		
ODI ≤ 30	2077 (26%)	6042 (74%)	**<0.0001**	1.22 (1.08 – 1.37)	655 (8%)	7464 (92%)	**0.007**	1.03 (0.85 – 1.24)
Drive occupation (Yes)	650 (27%)	1731 (73%)			224 (9%)	2157 (91%)		
Drive occupation (No)	1991 (27%)	5489 (74%)	0.524	1.05 (0.93 – 1.18)	607 (8%)	6873 (92%)	0.051	0.98 (0.82 – 1.18)
Heavy machine (Yes)	416 (27%)	1126 (73%)			171 (11%)	1371 (89%)		
Heavy machine (No)	2225 (27%)	6094 (73%)	0.851	0.88 (0.76 – 1.01)	660 (8%)	7659 (92%)	**<0.0001**	1.29 (1.05 – 1.58)
Sleepy driving (Yes)	---	---	---	---	505 (19%)	2136 (81%)		
Sleepy driving (No)	---	---	---	---	326 (5%)	6894 (95%)	**<0.0001**	4.56 (3.90 – 5.32)

Data are presented as n (%) unless indicated as p values or odd ratio (95% confidence interval). There were missing data for BMI.

Conclusion: Sleepiness while driving was the strongest predictor for sleep-related accidents. Factors for sleepiness while driving included moderate-severe EDS, males, age (≤40 years) and a high ODI. Factors for sleep-related accidents included males, moderate-severe EDS and operating heavy machinery. Occupational risk stratification influenced CPAP dispensation rates (50%-high, 37%-moderate, 23%-low; $p<0.0001$). This study highlights the importance of investigating sleepiness while driving in OSA populations.

The authors have no conflicts of interest to disclose.

Acute effects of combined cannabidiol (CBD) and Δ9-tetrahydrocannabinol (THC) in insomnia disorder: a randomised, placebo-controlled trial using high-density EEG

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Nathaniel S. Marshall[1,5], Ronald R. Grunstein[1,6], Camilla M Hoyos[1,2,4] on behalf of the 'CANSLEEP' investigator team.

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Introduction: Medicinal cannabis is often cited as a popular alternative to common sleep aids; however, there are limited studies using complex sleep EEG methods examining its' effects in insomnia disorder.

Methods: We used a randomised, placebo-controlled, double-blind, crossover trial design to explore the acute effects of combined 200 mg cannabidiol (CBD) and 10 mg Δ9-tetrahydrocannabinol (THC) ['CBD/THC'] on sleep and next-day function in 20 adults with clinician-diagnosed insomnia disorder (ISI>15). Participants completed two 24-hour inlaboratory visits during which they received a single oral dose of CBD/THC or matched placebo. Co-primary outcomes were total sleep time (TST) and wake after sleep onset (WASO). Secondary outcomes included sleep architecture metrics via polysomnography, global EEG power spectral analysis using high-density EEG, and next-day neurobehavioural function. Trial registration: ACTRN12619000714189.

Results: All 20 randomised participants (16 female; mean (SD) age, 47.1 (8.7) years) completed the protocol. Compared to placebo, CBD/THC significantly decreased TST (-24.5 min, p=0.047) with no significant change to WASO (+10.7 min, p=0.422). CBD/THC also significantly decreased time spent in REM sleep (-33.9min, p0.05). Eighty-five mild, nonserious, adverse events were reported (55 during ETC120; most common dry mouth).

Conclusion: A single oral dose of combined 200 mg CBD and 10 mg THC reduced total sleep time with a clear effect of REM sleep suppression. However, no next-day residual impairment on cognitive function, alertness or simulated driving performance was observed. Further research is required to determine the impact of chronic cannabinoid dosing on REM sleep and other objective sleep outcomes in insomnia disorder. Conflict of Interest Statement: The study was funded by the Lambert Initiative for Cannabinoid Therapeutics, a philanthropically funded centre for cannabinoid research at the University of Sydney, Australia.

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The health effects of 72 hours of simulated wind turbine infrasound: A double-blind randomized crossover study in noise-sensitive, healthy adults

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Aims: Large electricity-generating wind turbines emit both audible sound and inaudible infrasound at very low frequencies that are outside of the normal human range of hearing. Sufferers of wind turbine syndrome (WTS) have attributed their ill-health and particularly their sleep disturbance to the signature pattern of infrasound. Critics have argued that these symptoms are psychological in origin and are attributable to nocebo effects. We aimed to test the effects of 72 h of infrasound (1.6–20 Hz at a sound level of approximately 90∼90dB pk re 20 micropascals20μPa, simulating a wind turbine infrasound signature) exposure on human physiology, particularly sleep.

Methods: We conducted a randomized double-blind triple-arm crossover laboratory-based study of 72 h exposure with a >10-d washout conducted in a noise-insulated sleep laboratory in the style of a studio apartment. The exposures were infrasound (approximately 90∼90 dB pk), sham infrasound (same speakers not generating infrasound), and traffic noise exposure [active control; at a sound pressure level of 40–50 dB LAeq,night and 70 dB LAFmax transient maxima, night (2200 to 0700 hours)]. The following physiological and psychological measures and systems were tested for their sensitivity to infrasound: wake after sleep onset (WASO; primary outcome) and other measures of sleep physiology, wake electroencephalography, WTS symptoms, cardiovascular physiology, and neurobehavioral performance.

Results: We randomized 37 noise-sensitive but otherwise healthy adults (18–72 years of age; 51% female) into the study before a COVID19-related public health order forced the study to close. WASO was not affected by infrasound compared with sham infrasound (negative 1.36−1.36min; 95% CI: negative 6.60−6.60, 3.88, lowercase italic p equals 0.60p=0.60) but was worsened by the active control traffic exposure compared with sham by 6.07 min (95% CI: 0.75, 11.39, lowercase italic p equals 0.02p=0.02). Infrasound did not worsen any subjective or objective measures used.

Conclusions: Our findings did not support the idea that infrasound causes WTS. High level, but inaudible, infrasound did not appear to perturb any physiological or psychological measure tested in these study participants. https://doi.org/10.1289/EHP10757

All of the authors have superannuation accounts which are compulsory in Australia and these accounts may contain investments in both traditional and renewable energy, including wind turbines. R.T. is the founding principal of Renzo Tonin Associates who have previously worked as consultants for the NSW Department of Planning on several wind farms in NSW, Australia. None of the investigators have any other pecuniary interest or academic conflicts of interest in the outcomes of this study.

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Sleepier females in a clinical population referred for obstructive sleep apnoea are discharged at higher rates than males

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Aims: The sleep pathway in Waitaha uses standardised patient symptom questionnaires and a level 4 sleep study to screen patients for obstructive sleep apnoea (OSA). This information is reviewed by an expert clinical panel to consider treatment options. Positive airway pressure (PAP) therapy is offered to patients meeting the clinical criteria for treatment (hypoxic burden/sleepiness/occupational risk/co-morbidities). It is accepted there are gender-related differences in prevalence, symptoms, diagnosis and treatment of OSA. The aim of this study was to investigate gender-related differences in an established OSA diagnosis/treatment pathway. We hypothesize that, compared with males, females represent a lower proportion of referrals, and present with differences in symptoms and treatment outcomes.

Methods: One calendar year (2021) of clinical referrals through the sleep pathway were included for analysis. Demographics, anthropometrics, symptoms, oxygen desaturation index (ODI), PAP dispensation rates, and PAP adherence were included in the analysis. Gender differences were calculated using the Mann-Whitney U test and Fisher's exact test. A p-value < 0.05 was regarded as statistically significant.

Results: Data from 1640 sleep assessments were analysed. Gender differences are summarised in the table below.

	Female (n = 651, 40%)	Male (n = 989, 60%)	P
Age (yrs), median (IQR)	50 (38 – 59)	51 (39 – 62)	0.009
BMI ($kg.m^{-2}$), median (IQR)	34.9 (29.6 – 41.5)	32.1 (28.4 – 37.0)	< 0.0001
Neck (cm), median (IQR)	38.5 (36.0 – 42.0)	43.0 (41.0 – 46.0)	< 0.0001
ESS, median (IQR)	13.0 (8.0 – 17.0)	12.0 (8.0 – 16.0)	0.023
ODI (#/hour), median (IQR)	6.7 (2.5 – 15.8)	11.5 (4.1 – 28.6)	< 0.0001
Discharged (n, %)	441 (68%)	534 (54%)	< 0.0001
CPAP treatment (n, %)	151 (23%)	365 (37%)	< 0.0001
CPAP Adherent (n, %)	87 (65%)	211 (62%)	0.599

Females represent a lower proportion of referrals through the sleep pathway and are sleepier, with higher BMIs and lower ODIs than males. Females are offered publicly-funded PAP therapy at lower rates and demonstrate a similar level of adherence to PAP therapy, compared with males.

Conclusion: Sleepier females are being discharged from the pathway at a higher rate and dispensed PAP therapy at a lower rate than males. Whilst females entering the sleep pathway tend to have a lower ODI than males, careful consideration of the PAP therapy dispensation criteria is required to better serve sleepy females referred to the sleep pathway, without creating further inequities between genders.

The authors have no conflicts of interest to disclose.

Comparison of the responsiveness of two oximeters on the same hand of a participant during an overnight sleep study – do oximeters respond in the same way regardless of skin type?

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Aims: Oxygen saturation is crucial in the diagnosis of sleep disorders and to provide insight into the appropriate treatment for patients under hospital care (1). This quality assurance study compares the oxygen saturation collected from 2 oximeters on the same hand of 30 sleeping patients during an overnight PSG study. Three pulse oximeters are currently in use at the Alfred Sleep Laboratory. The standard of care oximeter used for in-lab PSGs- the RAD7 oximeter was compared to either the portable Nonin or the RAD5. During portable PSG studies- the standard of care Nonin oximeter was compared to the Masimo RAD5.
The aim of this study was to assess each oximeter's responsiveness in patients during an overnight PSG study and to compare blood gas SaO_2 values with oximeter SpO_2 values in light and dark skinned patients.

Methods: Oxygen saturation data from the participant's fingers were recorded and downloaded with corresponding software: Rad5 (Masimo, Irvine, CA, USA, 2sec averaging time) with Visi-Download (Stowood Scientific, Oxford, UK), Rad7 (Masimo, Irvine, CA, USA, 2-4sec averaging time) with PSG 4 (Compumedics, Melbourne, Australia), Wrist-Ox2® (Nonin Medical Inc, Plymouth, MN, USA, 3sec averaging time) with Noxturnal (Nox Medical Inc, Reykjavik, Iceland). The data was compared to assess the responsiveness of each oximeter to changes in the participant's breathing overnight. If arterial blood gases were requested, SaO_2 was compared to SpO_2 values taken at sample collection. Skin pigmentation was evaluated using the Fitzpatrick scale.

Preliminary Results: To date, 4 patients have been enrolled - Age 47.5 ± 8.5 years, BMI 31.1 ± 4.0 kg/m2, 100% male, 75% Fitzpatrick scale (type I or III – light skinned). Preliminary data includes the collection of 3 blood gas samples. All oximeters recorded so far are detecting SpO_2 within specification. Interestingly, oximeter responsiveness differences were noted between darker and lighter skinned participants.

Conclusions: Discrepancies in oxygen saturation determination may have an important clinical impact on the diagnosis of sleep disorders.

(1).Blanchet MA, Mercier G, Delobel A, Nayet E, Bouchard PA, Simard S, L'Her E, Branson RD, Lellouche F. Accuracy of Multiple Pulse Oximeters in Stable Critically Ill Patients. Respir Care. 2023 May;68(5):565-574. doi: 10.4187/respcare.10582. Epub 2023 Jan 3. PMID: 36596654; PMCID: PMC10171338.

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