disruption as measured by higher night-to-night variation in sleep duration and increased risk of cardiovascular disease (CVD). It remains unclear whether this association varies by CVD types or by genetic risk for CVD.
Materials and Methods: In the UK Biobank, 89,581 participants who provided valid 7-day accelerometer data in 2013-2016 and were free of CVD at the time of accelerometer measurement were prospectively followed until September 2021. Incidence of CVD events, defined as first occurrence of myocardial infarction (MI), stroke, or cardiovascular death, was identified through linkage to Hospital Episode Statistics data using the ICD-10 codes. Sleep irregularity was evaluated by the standard deviation (SD) of accelerometer-measured sleep duration over 7 days. We used multivariable Cox proportional hazard models to estimate hazard ratios (HRs) and 95% CIs for incident CVD events across categories of the 7-day sleep duration SD. Genetic susceptibility to CVD was modeled by weighted polygenic risk scores (PRS). Gene-sleep interaction was assessed by the likelihood ratio test of the multiplicative interaction term between continuous sleep duration SD and PRS tertiles.
Results: We documented 2,604 incident cases of total CVD events (MI: 1,015, stroke: 1,047, cardiovascular death: 894) over 587,459 person-years of follow-up. After adjusting for age, sex, race, Townsend deprivation index, work schedules (including shift work status), and family history of CVD, the HR (95% CI) for total CVD events was 1.10 (0.97, 1.24) for those with a sleep duration SD of 30-44 minutes, 1.22 (1.08, 1.39) for 45-59 minutes, 1.39 (1.22, 1.59) for 60-89 minutes, and 1.46 (1.25, 1.71) for ≥90 minutes, compared with participants with a sleep duration SD <30 minutes (p for trend<0.0001). This linear positive association was consistently observed for different CVD types. The HR (95% CI) associated with a 1-hour increase in sleep duration SD was 1.21 (1.13, 1.29) for total CVD, 1.23 (1.11, 1.36) for MI, 1.21 (1.09, 1.35) for stroke, and 1.20 (1.07, 1.34) for cardiovascular death. Additional adjustment for lifestyle factors (smoking status, alcohol consumption, diet quality, physical activity, and BMI) and co-morbidities (hypertension, hyperlipidemia, diabetes, and depression) only modestly attenuated the association (HR for total CVD per 1-hour increment in sleep duration SD: 1.17; 95% CI: 1.09, 1.25; p for trend<0.0001). Higher sleep irregularity was associated with increased CVD risk irrespective of genetic risk (p for interaction>0.55).
Conclusions: Higher night-to-night variation in accelerometer-measured sleep duration was associated with consistent increases in the risk of MI, stroke, and cardiovascular death, and these associations did not seem to be modified by genetic risk for CVD.
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AROMATHERAPY AND HERBAL MEDICINE AND THEIR EFFECTS ON SLEEP AND ANXIETY DURING THE PERIOPERATIVE PERIOD: A SYSTEMATIC REVIEW

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Introduction: Surgeries can result in sleep disturbances and disorders, which increase mortality and morbidity. Pharmacological and non-pharmacological interventions are used to promote sleep quality in patients. However, pharmacological methods may lead to complications, such as cognitive impairment, suppression of the respiratory system, and risk of tolerance and dependence. Complementary therapies, including aromatherapy and herbal medicine, can relieve stress and anxiety and improve sleep quality. Our aim was to conduct a systematic review looking at the effects of non-pharmacological therapies, especially non-regulated drugs, on improving sleep in patients during the perioperative period. We intend to apply the knowledge described here as an intervention to promote higher quality sleep and to reduce anxiety for patients undergoing surgery.
Materials and methods: A systematic review was conducted utilizing the PRISMA 2020 guidelines to explore non-pharmaceutical modalities to improve sleep and recovery in post-operative patients. English articles that were published within the past 10 years were identified through keyword searches. Keywords included: perioperative AND surgery AND sleep NOT (sleep apnea); postoperative sleep disturbances NOT (sleep apnea); surgery AND sleep NOT (sleep apnea). Searches provided 2678 articles from each of the following databases: 843 – Embase; 623 – PubMed; 568-Scopus; 394 – Web of Science; 250 – CINAHL. Duplicates were removed (928), leaving 1750 studies to screen. Inclusion and exclusion criteria were determined by investigators' consensus. Criteria included requiring a focus on sleep disturbance in the post-operative period with non-pharmacological interventions, and excluding a focus on sleep apnea or a diagnosis of delirium/dementia. Two independent reviewers voted on inclusion of an article used in data extraction or exclusion from the review, and in cases of conflict between reviewer votes, consensus during a group meeting was obtained by all reviewers. Articles focusing on non-regulated drugs were selected. Seven articles were used in this study; all of which were randomized controlled studies.
Results: Multiple sleep parameters were measured in the identified studies using scales, such as the Pittsburgh Sleep Quality Index (PSQI), the St. Mary's Hospital Sleep Inventory, the Vernan and Snyder-Halpern (VSH) Sleep Scale, the Subjective Sleep Quality Index, the Visual Analog Sleep Scale (VASS), the Richard Campbell Sleep Questionnaire (RCSQ), and self-reported evaluations. Data from the 7 articles identified showed some beneficial effects of aromatherapy and herbal medicine on improving sleep quality and reducing anxiety. Five of these articles noted improvements in sleep quality, where 2 articles demonstrated better sleep efficiency, shortened sleep latency, longer sleep duration, and decreased daytime dysfunction. Two of the articles noted reduction in anxiety.
Conclusions: These data suggest aromatherapy and herbal medicine are safe, effective, non-pharmacological interventions that promote sleep quality and reduce anxiety. Further prospective studies are needed to look at these interventions on sleep.

ASSESSING SLEEP QUALITY OF PROFESSIONAL DRIVERS: AN ANALYSIS BASED ON SELF-PERCEIVED AND SLEEP COMPANIONS' FEEDBACK

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Introduction: Portugal has been ranked as the fourth European country with the highest incidence of falling asleep while driving. The quality of sleep comprises both quantitative aspects, such as sleep duration and sleep latency, and qualitative aspects, such as mood and health status. Neglecting the quality and quantity of sleep can result in fatigue, affecting multiple aspects of safe driving, such as attentiveness to the road. Although quantitative measures of sleep are easy to assess, evaluating subjective aspects of sleep is more challenging. Poor sleep quality and habits were the most commonly cited reasons for falling asleep at the wheel. Given the high prevalence of road accidents in Portugal and the significant impact of sleep quality on driving safety, there is a need for comprehensive research on the sleep quality of professional drivers. Adult sleep is often a shared activity between sleep companions, making it a crucial aspect to investigate for a better understanding of sleep perceptions. The main objective of this study is to analyze the sleep quality of a population of Portuguese professional drivers and compare it with the responses given by their sleep companions.
Materials and Methods: This observational study is of transversal nature meaning that data collection was performed individually at a single point in time. The target population was Portuguese professional drivers and if applicable their sleep companions. The validated and translated version of the Portuguese Pittsburgh Sleep Index and the complementary questionnaire was applied to 43 Portuguese drivers between 23 and 63 years old. Fisher exact tests were used to evaluate the variables' association. The level of significance was 0.05. SPSS 28 version was used for data analysis.
Results: Having into consideration the global score of the PSQI instrument (7.41±5.15), 13 subjects (30.24%) had a score lower than 5 points, therefore, considered with good sleep quality, and 30 drivers (69.76%) had a score higher or equal to 5 points, thus considered to have poor bad sleep quality. The partner's questionnaire was answered by the driver's partner

regarding the driver's sleep, and the PSQI was answered by the drivers regarding their own sleep quality. The majority of the subjects replied that during the last month, the drivers did not snore during the night. The analysis of the answers revealed that, according to sleep companions, drivers experience drowsiness more frequently than what the drivers themselves perceive (p-value < 0.05).

Conclusions: This analysis revealed that regarding sleep quality, the majority of the drivers were classified with poor sleep quality. It was possible to infer an association between the self-perceived sleep of the drivers, and their sleep partners regarding drivers' sleeping and snoring habits and the excessive sleepiness that drivers have while driving.

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ASSESSING SUBJECTIVE SLEEP QUALITY USING THE PITTSBURGH SLEEP QUALITY INDEX AMONG HOMELESS INDIVIDUALS IN SãO PAULO, BRAZIL

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Introduction: Sleep quality is essential for overall well-being, and sleep loss is associated with a range of physical and mental health consequences. This study sought to assess the subjective sleep quality of individuals experiencing homelessness in São Paulo city, exploring different aspects of sleep quality, substance use and sociodemographic factors.

Materials and Methods: Participants were recruited from the homeless population (convenience sample) in São Paulo, Brazil through the services of Consultório na Rua, which provides medical, psychological, and social assistance to this population. A trained healthcare professional applied the Pittsburgh Sleep Quality Index (PSQI) and Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) tests individually. For the analyzes, we used a Generalized Linear Model (GzLM) and the dependent variable was the overall score on the PSQI and its sub-components. Independent variables considered were place of sleep, gender, and substance use as well as their interaction. Age-related time on the streets was included as a covariate. The post hoc test applied was the Bonferroni test.

Results: In geThe final sample consisted of 177 participants (39 female, of which 7 identified as transgender), with a mean age of 42.8±11.4 years (range: 20-71) and 10.5±8.4 years (range: 1-40) being homeless. Sixty-seven percent of the subjects had good subjective sleep quality (mean PSQI score: 4.9±2.7), 33% slept in shelters, 83% used depressants drugs, 83% stimulants and 59% hallucinogens. Regarding the global score, individuals that used depressants (p=0.019 MD=1.2) and stimulants (p=0.007 (MD=1.5) had poorer subjective sleep quality. Taking into account PSQI components, individuals who slept at the shelters had higher scores (p=0.026 MD=0.6), and the longer they live on the streets, lower the score for sleep latency (β=-0.01). We also observed that individuals that used depressants took more time to fall asleep (p=0.031 MD=0.4) and the ones that used this substance and slept in the shelter slept more (p=0.047 MD=0.7). Individuals that used stimulants had more sleep disturbances (p=0.039 MD=0.3). Women took more time to fall asleep (p=0.003 MD=0.9) and had more daytime dysfunctions than men (p=0.013 MD=0.7).

Conclusions: While most individuals showed good subjective sleep quality, the unstable and hazardous living conditions of homelessness affect their sleep in several dimensions. We found that sleep latency tends to be more prolonged in homeless people, likely due to the stringent admission and sleep schedules in shelters; however, latency decreases as individuals spend more time homeless. Likewise, women tend to have worse quality of sleep than men, whether they are sleeping on the street or in shelters. The use of psychoactive substances negatively influences sleep quality. These results emphasize the necessity of addressing the living conditions of these vulnerable populations.

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ASSESSMENT OF ULTRA-SHORT TERM HEART RATE VARIABILITY INDICES IN OBSTRUCTIVE SLEEP APNEA

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Introduction: Obstructive Sleep Apnea (OSA) is associated with intermittent episodes of hypoxia and arousals resulting in sympathetic overactivity, which is postulated to be one of the principal contributors for cardiometabolic consequences. Heart Rate Variability (HRV), which reflects the beat-to-beat variation in R-R intervals on electrocardiography (ECG) , helps assess changes in cardiac autonomic control. Although long term HRV has been reported to be decreased in OSA, studies on short term and ultra-short term HRV indices are limited. Our study aimed to assess ultra-short term HRV indices in patients with OSA.

Materials and Methods: This cross-sectional study was conducted between December 2021 and May 2023. Adults diagnosed with moderate and severe OSA on level 1 polysomnography were included. Stable, 30 second ECG segments were extracted using a dedicated algorithm during sleep stages (Non-Rapid Eye Movement; NREM; Rapid Eye Movement; REM) and respiratory events (Apnea and Hypopnea). These segments were assessed for ultra-short term HRV including time domain (mean NN, SDNN, RMSSD) and nonlinear indices (SD1/SD2, Shannon entropy).

Results: Forty-four patients each with moderate and severe OSA were included. Mean (SD) age was 49.7 (14) years with a predominance of males (n=57; 64.7%). Co-morbidities included hypertension (34.1%), diabetes mellitus (30.6%) and hypothyroidism (6.8%). Mean (SD) apnea hypopnea index (AHI) was 18.4 (3.07) for moderate and 61.5 (23) for severe OSA respectively. A total of 2549 ECG segments (moderate - 1159; severe - 1390) were analysed.

Time domain indices showed a significant difference between moderate and severe OSA. Median (IQR) SDNN was 42.33 (26.47 – 66.75) and 38.28 (23.86 – 69.08) (p=0.048); Median (IQR) RMSSD was 28.49 (18.18 – 48.70) and 26.77 (16.22 – 45.81) among moderate and severe OSA respectively (p=0.005) . Nonlinear indices showed a significantly higher median (IQR) SD1/SD2 of 0.46 (0.29 – 0.63) in moderate OSA; it was 0.42 (0.27 – 0.58)in severe OSA (p=0.001), while Shannon entropy was 4.10 (3.76 – 4.37) and 4.06 (3.64 – 4.40) in moderate and severe OSA respectively (p=0.258) .

Sleep stage HRV indices were significantly different between NREM and REM sleep . Median (IQR) values in NREM and REM were: Mean NN of 820.14(733.20 – 907.83) and 831.85 (763.29 – 24.19) (p<0.001); SDNN of 38.63(24.22 – 66.97) and 44.14 (27.05 – 69.97) (p=0.002); SD1/SD2 ratio of 0.45 (0.29 – 0.63) and 0.37 (0.25 – 0.56) (p<0.001); and Shannon entropy of 4.06 (3.67 – 4.37) and 4.12 (3.76 – 4.39) (p=0.025) respectively.

Event specific assessment showed a significant difference in HRV between hypopneas and apneas. Median (IQR) values during hypopneas and apneas were: SDNN 33.75 (21.93 – 54.79) and 65.51 (38.50 – 111.87) (p <0.001); RMSSD 25.86 (14.32 – 41.28) and 40.02 (24.03 – 89.77) (p<0.001); SD1/SD2 0.45 (0.29 – 0.63) and 0.41 (0.26 – 0.60) (p=0.024); Shannon entropy 3.93 (3.55 – 4.24) and 4.38 (4.06 – 4.55) (p<0.001) respectively.

Conclusions: Ultra-short term HRV indices, including time domain and nonlinear indices were significantly lower with hypopneas, during NREM sleep and in severe OSA indicating autonomic instability triggered by hypoxia, specific sleep stages and respiratory event frequency.

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