response was collected unanimously by teachers. High risk children for sleep apnea were identified using apnea-associated symptoms related either to sleeping, anxiety, attention deficiency or emotional behavior. The participants whose information was not available were omitted from the analysis. Uni-variable and multivariable regression and logistic analyses were conducted, using SAS version 9.0 software.

**Results:** More than 90% of care-givers responded to the questionnaire, and 75% of them revealed the STBUR score of 0, while 0.3% did STBUR score of 3 or greater. Mostly, 1,800 pupils were regarded as having higher risk for sleep apnea, and thus invited for detailed examination. Data from around 700 participants were available for the subsequent analysis. The prevalence of severe sleep apnea (RDI = 5 or over) was 0.9% in those with STBUR scores of 0, 3.0% with STBUR scores of 1, 6.4% with STBUR scores of 2, and 13.3 with STBUR scores of 3, 4, and 5. According to multivariable logistic analysis odds ratio (95% confidence interval) vs STBUR score 0 were 3.54 (0.76 to 16.64) in STBUR score 1, those STBUR score 2 were 8.10 (1.71 to 38.40) after adjusted with grade, attention deficiency, hyper dyskinesia, while those of STBUR score 2 were 19.61 (3.33 to 115.47) after adjusted with grade, attention deficiency, hyper dyskinesia (p trend <0.001).

**Conclusion:** STBUR scores and RDI values were associated, suggesting that high STBUR score (3 or over) well predicts sleep apnea (5/hr<RDI).

**Support (If Any):**

**0502**

**RELATIONSHIP BETWEEN ANTHROPOMETRIC PARAMETERS AND OBSTRUCTIVE SLEEP APNEA IN SCHOOL AGE CHILDREN**

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**Introduction:** Pediatric obstructive sleep apnea (OSA) is more common in obese children. However, the role of fat distribution in the pathogenesis of OSA in this age group is controversial. We evaluated the association of OSA to excess adiposity and abdominal fat. We hypothesized a positive correlation between anthropometric parameters and OSA and an inverse correlation between obesity and the oxyhemoglobin saturation (SpO2) nadir in a large sample of school-aged children with OSA.

**Methods:** We investigated the baseline data from the childhood adenotonsillectomy trial (CHAT). The relationship between apnea hypopnea index (AHI), SpO2 nadir, peak CO2 during sleep and body-mass index Z-score (BMI z-score), waist:height ratio (WTHR) and neck:height ratio (NHR) was evaluated. AHI was evaluated using linear regression in log scale which improved its distribution towards normal. Other outcomes were evaluated using Spearman correlations.

**Results:** 452 children were analyzed (52% girls). The mean ± SD age was 7 ± 1.4years. The mean BMI Z-score was 0.8 ± 1.3. There was a positive correlation between log AHI and BMI Z-score (β=0.06, r=0.10, p=0.03) and WTHR; (β=1.00, r=0.10, p=0.03), and an inverse correlation between SpO2 nadir and BMI Z-score (r=0.19, p=0.0005), and WTHR (r=−0.17, p=0.0002) and NHR (r=−0.12, p=0.008). When corrected for multiple comparisons, there remained an inverse correlation between SpO2 nadir and BMI z-score and SpO2 nadir and WTHR.

**Conclusion:** BMI Z-score and WTHR, an index of visceral fat, correlate with the degree of desaturation during sleep in school-age children. However, in contrast to adults, anthropometric measures do not correlate with indices of upper airway obstruction such as the AHI. We speculate that restrictive lung disease and a lower pulmonary reserve in obese children predisposes to deeper oxyhemoglobin desaturation with obstructive events.

**Support (If Any):** Funded by the National Institutes of Health; CHAT ClinicalTrials.gov number, NCT00560859.

**0503**

**EXERCISE PRACTICE IS INDEPENDENTLY ASSOCIATED WITH PERCEIVED SLEEP QUALITY, BUT NOT SLEEPINESS IN SEVERE OBSTRUCTIVE SLEEP APNEA PATIENTS**


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**Introduction:** Obstructive sleep apnea (OSA) patients may be asymptomatic. Regular exercise improves the sense of well-being and may alleviate OSA symptoms. In the present study we investigated in severe OSA patients whether exercise is associated with better sleep quality and milder symptoms.

**Methods:** Subjects answered the International Physical Activity Questionnaire and were then classified as exercisers or non-exercisers. Additional questionnaires about sleep-related symptoms were applied after undergoing full-night polysomnography. Only subjects with apnea-hypopnea index (AHI)>30 events/hour were included. Sleepiness was assessed by the Epworth scale, tiredness by one question of the STOP questionnaire, sleep misperception by the question: “Do you wake-up feeling like you had not slept?”, and “Rate from 0 to 10 the quality of your sleep.”; scores <5 indicated poor sleep.

**Results:** We included 488 exercisers (35%) and 907 non-exercisers, 81% men. The mean (±SD) age was 49 ± 14 years, body mass index, 33 ± 6.9kg/m2, and AHI, 53 ± 20 events/hour. Exercisers and non-exercisers were significantly different in terms of anthropometric, polysomnographic, and perceived-sleep variables. Exercisers had lower AHI (48 ± 17 vs. 56 ± 21 events/hour), snoring score, time with saturation below 90% (36 ± 43 vs. 50 ± 52 minutes), and higher minimum saturation (77 ± 9 vs. 75 ± 10%; P<0.001 for all comparisons). Exercisers had also lower tiredness, poor sleep, and sleep misperception. The Epworth sleepiness scale score was also lower in exercisers (P=0.002) but did not resist adjustment for confounders. Exercise practice was associated with ~30% lower odds ratio for tiredness, poor sleep, and sleep misperception after full adjustment.

**Conclusion:** About one third of severe OSA cases perform programed exercise contrary to the expectation of generalized sedentarism in this population. Exercise is independently associated with better perceived sleep quality and less tiredness. This finding should be taken in consideration when employing symptom-based scores to assess OSA risk in exercisers since they are more likely to be asymptomatic.

**Support (If Any):** Nothing to declare.

**0504**

**EFFECT OF AGE ON CLINICAL AND POLYSOMNOMIC CHARACTERISTICS IN PATIENTS WITH OBSTRUCTIVE SLEEP APNEA SYNDROME (OSAS)**

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**Introduction:** There is limited data on clinical and polysomnographic characteristics in patients with obstructive sleep apnea syndrome (OSAS) in different age groups. We aimed to investigate possible
influence of age on sleep architecture and daytime sleepiness in a large sample of OSAS patients.

**Methods:** We enrolled 2399 patients with OSAS (apnea-hypopnea index, AHI ≥ 5) divided into two age groups: over 65 (n = 1180, mean age 70.2 ± 4.5 years), and 65 or under (n = 1219, mean age 50.1 ± 10.9 years). Subjective daytime sleepiness, reflected by the Epworth sleepiness scale (ESS), and polysomnographic parameters were recorded and compared between the two groups.

**Results:** There were no significantly differences regarding gender, BMI, daytime sleepiness (31.9% vs 46.7% had ESS>10) between the elderly and younger patients with OSAS, but the incidence of comorbidities such as hypertension and other cardiovascular diseases was significantly higher (p<0.001). The sleep architecture was significantly worse in elderly OSAS patients with lower SE (%) (p<0.001), REM (%) (p<0.001), and higher NREM (%) and WASO (p<0.001) compared with the younger patients. The percentage of SWS, apnea hypopnea index (AHI), and oxygen desaturation index (ODI) had no significantly difference in the two groups. The mean and the lowest oxygen saturation and arousal index were significantly decreased in elderly OSAS patients (p<0.001).

**Conclusion:** Our results suggest that objective sleep quality was more impaired in elderly compared to younger-aged patients. Additionally the prevalence of sleepiness in the elderly group was low and elderly had more cardiovascular comorbidities.

**Support (If Any):** None

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**0505**

**SLEEP APNEA BREATHING DISTURBANCES ARE ASSOCIATED WITH OBJECTIVE SLEEPINESS INDEPENDENT OF HYPOXIA**

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**Introduction:** Sleep-disordered breathing (SDB) is associated with sleepiness, high blood pressure, and cardiovascular diseases. Cardiovascular associations have been linked to oxygen desaturation. Less is known regarding SDB associations with sleepiness. Different physiologic associations (e.g. arousal vs desaturation) of SDB events may result in different pathobiologic outcomes.

**Methods:** 2,112 nocturnal polysomnograms (PSGs) from 1,022 subjects in the Wisconsin Sleep Cohort were analyzed with our automated algorithm, which was developed to detect breathing disturbances (decrease of 30% in nasal airflow for at least 10 seconds, without a concomitant increase in oral flow) and desaturations. Breathing disturbance events were time-locked to desaturations, resulting in 2 indices: desaturating (H-BDI) and non-desaturating (NH-BDI) events. Systolic and/or diastolic hypertension was used as a measure of cardiovascular health. Measures of subjective (Epworth Sleepiness Scale) and objective (2,981 MSLTs from a subset of 865 subjects) sleepiness were analyzed. Additional, clinically relevant variables were accounted for in modeling associations.

**Results:** H-BDI, but not NH-BDI, correlated strongly with SDB severity indices that included hypoxia (r=0.89, p<0.001 with ODI 3% and AHI with 4%-desaturations). Each twofold increase in desaturation-associated events was associated with an increased risk of hypertension (3% ODI OR=1.06, 95% CI=1.00–1.12, p<0.05) and daytime sleepiness (β=0.20 ESS score, p<0.0001; β=0.20 min in MSL on MSLT, p<0.01). Non-desaturating events were more strongly associated with objective sleepiness (β=0.52 min in MSL on MSLT, p<0.001), but had less association with subjective sleepiness (β=0.12 ESS score, p=0.10). In longitudinal analyses, severity of baseline non-desaturating events was independently associated with worsening of 3% ODI over a 4-year follow up.

**Conclusion:** In SDB, non-desaturating events are independently associated with objective daytime sleepiness, beyond the effect of desaturating events. The independent association of baseline non-desaturating breathing disturbances with a future worsening of desaturating suggests that non-desaturating events reflect a milder form of SDB.

**Support (If Any):** Grants/gifts to the Stanford Sleep Center, Lundbeck Foundation, Technical University of Denmark, and Danish Center for Sleep Medicine. Dr. Schneider is supported by T32 HL110952. Drs. Peppard and Hagen, and Ms. Finn were supported by R01 HL062252 and UL1 RR025011.

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**0506**

**FALLING ASLEEP VERSUS FEELING SLEEPY IN SLEEP APNEA SCREENING**

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**Introduction:** The symptom of sleepiness can be assessed by different methods such as the multiple sleep latency test, the maintenance of wakefulness test and the Epworth sleepiness scale (ESS), each one contemplating different dimensions of sleepiness. ESS, for instance, assesses the propensity to falling asleep in soporific situations. The ESS correlates weakly with the apnea-hypopnea index (AHI) and is a poor predictor of obstructive sleep apnea (OSA). We performed a retrospective cross-sectional study to test whether a single question on perceiving oneself as sleepy can replace the ESS to detect different levels of AHI.

**Methods:** From a sleep laboratory database we selected records of adults that underwent baseline in-laboratory full-night polysomnography performed with standard equipment and scored using AASM criteria. All subjects replied to the following question: “Do you consider yourself sleepier than other people?” and answered the ESS.

**Results:** Exactly 3785 patients were included; 63% were men, the mean (±SD) age was 44 ± 13 years, body mass index (BMI), 29.6 ± 5.9kg/m², and AHI, 22.4 ± 23.7 events/hour. ESS>10 was observed in 1381 (36.5%) patients; 1887 (49.9%) considered themselves sleepier than other people (Sleepier). Factor analysis indicates that this question remains in the same component as the eight ESS items. Sleepier and ESS>10 patients were significantly different in terms of anthropometric, polysomnographic, and perceived-sleep variables. The Sleepier group had AHI>5 in 72.9% of the cases; the ESS>10 group had AHI>5 in 72.3% of the cases. Those in the Sleepier group had AHI>30 in 32.3% of the cases; those in the ESS>10 group had AHI>30 in 23.7% of the cases. To detect AHI>5: 29.6% of the cases. To detect AHI>30: 29.6% of the cases. To detect AHI>30: 29.6% of the cases. To detect AHI>30: 29.6% of the cases. To detect AHI>30: 29.6% of the cases. To detect AHI>30: 29.6% of the cases. To detect AHI>30: 29.6% of the cases. To detect AHI>30: 29.6% of the cases. To detect AHI>30: 29.6% of the cases. To detect AHI>30: 29.6% of the cases. To detect AHI>30: 29.6% of the cases.

**Conclusion:** Sleepiness is knowingly a poor predictor of OSA. In case of time limitation to obtain the ESS score, one question on self-perceived sleepiness will perform only slightly inferiorly to the ESS, in OSA screening. Feeling sleepy reproduces the same dimension...