

as advised and self-reported sleep quality improvements in sleep medicine clinic patients using CPAP early in the pandemic and six months later.

Methods: Between June-November 2020, 81 sleep medicine clinic patients completed an online survey that included questions about CPAP use, using CPAP as advised, and changes in sleep quality associated with CPAP use. Patients were recontacted 6 months later to complete the same survey. Among survey respondents completing both surveys, 27 (50%; aged 58 \pm 18.2 y, 48% female, 67% Caucasian) reported using CPAP and were included in the present analysis. We conducted multivariate regression analyses Chi-square Association tests to determine whether self-reported CPAP use, CPAP use as advised, and sleep quality changed from baseline to 6-month follow up during the pandemic.

Results: Among CPAP users, 89% reported no change, 7% reported they use CPAP more, and 4% reported they use CPAP less at 6-month follow up. There was a significant increase in using CPAP as advised at 6-month follow up compared to the baseline survey, $p=0.003$. Additionally, there was a significant improvement self-reported sleep quality while using CPAP at 6-month follow up compared to the baseline survey, $p=0.012$.

Conclusion: Patients reported an increase in using CPAP advised and improvements in sleep quality as a result of CPAP use at 6-month follow up compared to a baseline survey administered early in the pandemic. Understanding why patients are more adherent to using CPAP as advised during the pandemic may help in developing interventions to increase CPAP adherence.

Support (If Any): This work is supported by National Institutes of Health Grant # R01NR018342 (PI: Nowakowski) and by the Department of Veteran Affairs, Veterans Health Administration, Office of Research and Development, and the Center for Innovations in Quality, Effectiveness and Safety (CIN 13-413).

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A PARADIGM FOR TESTING THE ACCURACY OF DIGITAL SLEEP STAGING SYSTEMS

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Introduction: Despite evidence showing that agreement between human and some automatic staging systems is generally comparable to agreement between human scorers, automated scoring is rarely used in clinical practice, even though it offers time savings and consistency. We propose a paradigm for testing digital systems that reveals their true accuracy vs. highly experienced academic scorers. As an example of a digital method to be tested, we used Michele Sleep Scoring (abbreviated:Digital).

Methods: 70 PSGs were scored by 6 experienced technologists from 3 academic centers. Staging results were compared to digital staging results using an epoch-by-epoch approach. For each PSG we carried out 6 cycles of comparisons. Each cycle consisted of two steps, one comparing one scorer (tested scorer) with the scoring of the five remaining scorers (judges), and one comparing Digital as the tested scorer with the same 5 judges. Error 1 was assessed when all judges disagreed with the tested scorer but there was disagreement between the judges. Error 2 was assigned when all judges disagreed with the tested scorer but agreed unanimously on the stage. For each PSG the number of epochs with types 1 and 2 errors was counted for each scorer (n=6 scorers) and for Digital. Results of

all 70 PSGs were pooled, and percent of types 1 and 2 errors is reported for all scorers and Digital.

Results: 70 PSGs (females aged 51.1 \pm 4.2 years) were evaluated. Average times in different sleep stages (manual scoring) were 43 \pm 18, 244 \pm 47, 30 \pm 21, and 81 \pm 25 minutes for stages N1, N2, N3 and REM, respectively. TST was 398 \pm 52 minutes, and sleep efficiency was 84 \pm 8%. There was a total of 65,053 epochs scored by each scorer and Digital. The average percent of type 1 errors made by scorers for all epochs was 6.4% (0-33.2) vs. 7.8% (1.68-26.6) made by Digital. The average percent of type 2 errors made by scorers for all epochs was 3.9% (0-28.6) vs. 4.3% (0-17.3) made by Digital.

Conclusion: This study provides an objective way of testing the accuracy of automated scoring systems and supports evidence that the accuracy of Michele Sleep Scoring is comparable to manual scoring.

Support (If Any): None

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PREVALENCE AND CORRELATES OF SLEEP DISORDERS AMONG USERS OF A CONSUMER SLEEP TECHNOLOGY

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Introduction: Sleep disorders constitute a major public health burden yet remain widely undiagnosed and untreated. The prevalence of diagnosed sleep disorders and associations with objectively measured sleep-wake dysfunction vary widely across populations. Here, we examined the self-reported prevalence and objective sleep architectural correlates of four sleep disorders in a large sample of individuals using a consumer sleep technology.

Methods: Data from 33,429 users (mean age: 44.6, 55.1% female) across 1,842,282 nights were included in the analysis from the PSG-validated SleepScore Mobile Application, which uses a non-contact, sonar-based method to objectively capture sleep-related metrics, and questionnaires to capture self-reported data. Subjective sleep disorder information was ascertained by asking users, “Which of the following sleep disorders has a healthcare professional diagnosed you with?” Linear regression was used for analysis, while age and gender were used as confounding variables, with the cohort reporting “None of the above” were used reference group for research purposes.

Results: The prevalence of reported disorders were “None of the above” (n=23,732, 71.0%), sleep apnea/SDB (n=5,309, 15.9%), insomnia (n=3,968, 11.9%), RLS/PLM (n=2,295, 6.87%), or narcolepsy (n=266, 0.8%). Narcolepsy was associated with the greatest reduction in TST (β =-23.6 mins, SE=3.475, $p<0.001$) while insomnia was associated with smallest (β =-5.7mins, SE=0.979, $p<0.001$). Narcolepsy was associated with the greatest increase in WASO (β =7.0 mins, SE=1.815, $p<0.001$) while insomnia was associated with smallest (β =2.2 mins, SE=0.511, $p<0.001$). RLS/PLM was associated with the greatest increase in SOL (β =3.9mins, SE=0.302, $p<0.001$) while sleep apnea/SDB was associated with the smallest (β =2.171 mins, SE=0.22, $p<0.001$). Narcolepsy was associated with the greatest decrease in SE (β =-3.05%, SE=0.5, $p<0.001$) while insomnia was associated with smallest (β =-1.42%, SE=0.1, $p<0.001$).

Conclusion: Self-reported sleep disorders were associated with objectively poor sleep in a big data consumer sleep technology analysis. These findings suggest consumer sleep technologies may have value in