

COMMENTARY

Interactions Between Sleep, Sleep Difficulties, and Quality of Life

Commentary on Bhushan et al. Total sleep time and BMI z-score are associated with physical function mobility, peer relationship, and pain interference in children undergoing routine polysomnography: a PROMIS approach. *J Clin Sleep Med*. 2019;15(4):641–648.

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Sleep is an essential part of the human existence. Sleep of a good quality and duration, especially in children, is associated with positive health outcomes including improved attention, behavior, learning, memory, emotional regulation, quality of life, and mental and physical health.^{1,2} Conversely, poor sleep is associated with learning, attention and behavior difficulties, increased risk for accidents and injuries, increased risk of depression, self-harm and suicidal thoughts, and increased risk of hypertension, obesity, and diabetes.^{1,3–5} Given the obvious benefits of good sleep and the serious consequences of poor sleep, it behooves us to better study and understand the interactions between sleep, sleep difficulties, and quality of life.^{6,7}

In this issue of the *Journal of Clinical Sleep Medicine*, Bhushan et al. explored some of these relationships. In this study, Bhushan and colleagues recruited and studied 86 youths aged 5–17 years who were referred for polysomnography (PSG) because of suspected obstructive sleep apnea (OSA). Prior to the PSG, parents completed a quality of life questionnaire, (the PROMIS-49, previously developed by the National Institutes of Health) addressing their child's physical function mobility, anxiety, depression, fatigue, peer relationships, and pain interference in the previous week. The goal was to determine if there was an association between OSA, total sleep time (TST), and any of the quality of life indicators. The benefit of using the PROMIS quality of life indicators is that it allowed the authors to detect associations between covariables as well.⁶

Perhaps surprisingly, neither the presence nor the severity of the OSA correlated with any of the quality of life indicators. TST did positively correlate with physical function and mobility as well as peer relationships. Other results included a negative association between body mass index (BMI) z-score and physical function mobility and pain intensity, controlling for sex, ethnicity, and TST. BMI z-score positively correlated with pain interference. Age positively correlated with fatigue and negatively correlated with peer relationships. Physical function mobility was positively associated with peer relationships, and negatively correlated with depression, fatigue, and pain interference. Depression correlated positively with pain interference and fatigue and negatively correlated with peer relationships. Fatigue positively correlated with the pain markers

and negatively correlated with peer relationships, and peer relationships negatively correlated with pain interference.

Overall, Bhushan and colleagues found that one night's TST, not the apnea-hypopnea index (AHI) nor the presence of OSA, is what correlated with pain, physical function, and peer relationships. This result aligned with a previous study that also was able to correlate TST (particularly slow wave sleep) of one night's PSG with biologic functions.⁵ Therefore, TST is an important factor to consider in a child's health, regardless of OSA status. There seems to be no direct association between the diagnosis of OSA, per se, with impaired quality of life. The lack of association is important because by treating the symptoms of the OSA (improving TST, etc.), the potential negative downstream sequelae may be ameliorated. This contrasts with some diseases, such as pancreatic cancer, where simply having the diagnosis is associated with depression.^{8,9}

As the authors described, this paper does have some significant limitations. Firstly, the authors never describe what is meant by the terms, pain interference, physical function mobility, etc. While these are the terms used by the PROMIS questionnaire, readers may not be familiar with what these characteristics describe. Second, the PROMIS is a strong quality of life measure, but it is primarily meant for the patient to complete although there is a parent proxy form. Older teens especially may not be forthcoming about issues such as peer relationships with their parents. Third, a control group of children with no concern for sleep-disordered breathing would have made the study more robust. And lastly, the authors note that they arbitrarily organized OSA into categories of mild, moderate, and severe, when there are no outcomes data to justify these categorizations. Using AHI as a continuous variable, may have yielded different statistical results.

Overall, this study by Bhushan et al. provokes interesting thoughts for the future. Because it seems to be that sleep itself, not OSA, is associated with some quality of living measures, it would be interesting to determine if these findings are predominantly due to a particular stage of sleep, eg, stage N3 sleep. In any case, these results would allow more advances in treating behavioral sequelae of poor sleep. Currently, treatment is concentrated on improving AHI, typically with continuous positive airway pressure or surgical intervention; a focus on

improving sleep itself should be a goal in improving quality of life in patients with OSA and others

CITATION

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DISCLOSURE STATEMENT

The authors report no conflicts of interest.