



Impact of Degree of Obesity on Sleep, Quality of Life, and Depression in Youth

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ABSTRACT

Objective: Obese youth are more likely to report difficulties with sleep, depression, and quality of life (QOL). This study aims to characterize sleep problems, QOL, and symptoms of depression by degree of obesity.

Method: The cross-sectional study was conducted in a specialized obesity clinic. Obese youth and their caregivers ($N = 150$) were evaluated with the Child Sleep Habits Questionnaire and Pediatric Quality of Life. Youth completed the Children's Depression Inventory. Regression models and correlations were calculated.

Results: Degree of obesity was predictive of increased sleep difficulties and decreased QOL scores. Children's Depression Inventory scores showed that children with more symptoms of depression had more sleep problems, and these were not associated with the degree of obesity. Adolescents with more difficulties sleeping also reported more symptoms of depression and lower QOL.

Conclusions: Degree of obesity negatively affected QOL and sleep variables. Patients with greater sleeping difficulties reported more symptoms of depression. *J Pediatr Health Care.* (2018) 32, e37-e44.

KEY WORDS

Depression, pediatric obesity, quality of life, sleep

INTRODUCTION

Currently 17% of youth are classified as obese, with an additional 5.8% classified as extremely obese (Ogden et al., 2016). Newer data show that these trends appear to have stabilized (Ogden, Carroll, Kit, & Flegal, 2014). For youth, *obese* is defined as a body mass index (BMI) greater than the 95th percentile, and *extreme obesity* is defined as a BMI greater than or equal to the 99th percentile for age and sex (Skelton, Cook, Auinger, Klein, & Barlow, 2009). Pediatric obesity has been linked to a host of physical health problems, including endocrine

and metabolic dysfunction, orthopedic morbidity, and pulmonary disease such as asthma and obstructive sleep apnea (Daniels, 2006; Skinner & Skelton, 2014). Obese youth have also been shown to have poor academic achievement (Taras & Potts-Datema, 2005). Specifically, overweight and obese youth had lower school attendance (Shore et al., 2008), lower grade point average (Fox, Barr-Anderson, Neumark-Sztainer, & Wall, 2010; Keating, Castelli, & Ayers, 2013), and increased number of detentions (Shore et al., 2008). Consequently, pediatric obesity has become a high-priority public health issue (World Health Organization, 2012).

Obese youth are also known to have greater psychosocial and behavioral issues compared with their nonobese counterparts (Modi & Zeller, 2008; Wardle & Cooke, 2005). Research has consistently shown that children and adolescents who fall in the overweight and obese categories are more likely to report negative self-perceptions, body image disturbance, difficulty in social situations, peer victimization, and symptoms of depression (Buttitta, Iliescu, Rousseau, & Guerrien, 2014; Schwimmer, Burwinkle, & Varni, 2003). It is also known that depression is associated with lower quality of life (QOL) in obese youth (Buttitta et al., 2014; Zeller & Modi, 2006).

Data indicate that overweight or obese pediatric patients are more likely to have sleeping difficulties. Poor sleep has been shown in cross-sectional studies to be related to obesity and in longitudinal studies to predate obesity (Frelut, 2010). Multiple studies have found that poor sleep quality and duration are associated with higher BMI (Chuang et al., 2015). Obesity, in turn, has been shown to be related to poor sleep (Beebe et al., 2006), with shorter sleep duration and more disrupted sleep patterns (Chaput, Burnet, & Tremblay, 2006; Hart & Jelalian, 2008). Other studies investigating psychosocial factors in pediatric obesity have shown that QOL and fatigue scores are comparable with pediatric patients receiving treatment for cancer (Schwimmer et al., 2003; Varni, Limbers, Bryant, & Wilson, 2010). The relationship between obesity and QOL has also been well documented, that children with higher BMI experience poorer QOL scores (Buttitta et al., 2014; Zeller & Modi, 2006).

Although the negative relationship between obesity, sleep, QOL, and depression has been documented, to our knowledge there has not been a study investigating how the degree of obesity affects these factors. The primary aim of this study was to characterize the interrelationships among sleep problems, QOL, and depression in obese youth based on the degree of obesity, as

reported by patients and their caregivers in an obese sample of youth followed up by a multidisciplinary pediatric obesity clinic. The present study investigated a large clinic-based sample of obese youth (all of whom had BMIs greater than the 95th percentile, and a significant portion of whom had BMIs greater than the 99th percentile). We hypothesized that higher BMI *z*-scores would predict higher rates of sleep difficulties, lower QOL, and higher rates of symptoms of depression. We also hypothesized that obese youth would experience significant sleep difficulties, and that lower QOL would be associated with worse sleep problems. Finally, it was hypothesized that depression symptoms would be associated with worse sleep problems, lower QOL, and higher BMI *z*-scores.

METHODS

This prospective self- and caregiver-report questionnaire study was conducted during a 13-month period. Full approval from the University of Arkansas for Medical Sciences institutional review board was obtained before initiation of the project, and participating youth and their parent/legal guardians were asked for assent/consent for participation during their initial visit to the multidisciplinary pediatric obesity clinic. All participants received a \$10 Walmart gift card.

Participants

The study participants were part of a larger study comparing sleep, QOL, and depression in an obese pediatric sample that included children aged 6 years, 0 months through 17 years, 11 months old. The sample for this specific study included children 6 years, 0 months through 12 years, 11 months old to capture school-age children and preadolescents to better understand confounders associated with sleep problems and obesity (e.g., increased depression, poor body image, and decreased QOL) in a younger population. Additionally, this subset captures the participants who completed the Child Sleep Habits Questionnaire (CSHQ). Exclusion criteria for the larger and current study include (a) caregiver other than primary caregiver was present at the clinic, (b) caregiver or patient had a reading ability insufficient for completion of measures, and (c) caregiver or patient had insufficient knowledge of English for completion of measures (e.g., requiring an interpreter for the appointment).

Procedure

The multidisciplinary clinic treats obese youth by using medical, psychological, and physical therapy and nutritional services. This clinic typically sees 58% female, 52% White, and 42% African American youth; 39% are younger than 10 years, 41% are between 10 and 14 years old, and 19% are older than 14 years. All new patients over a 13-month period ($n = 380$) were approached during the course of this study. Of these, 10.2% ($n = 39$) declined, and 10.3% ($n = 42$) were ineligible.

Data indicate that overweight or obese pediatric patients are more likely to have sleeping difficulties.

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