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The relationship between sleep problems and challenging behavior among children and adolescents with autism spectrum disorder

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ABSTRACT

Prior research has indicated fairly consistently that sleep problems appear to worsen ASD core symptomatology. As such, the present study was conducted to examine whether or not sleep problems also exacerbate behavior problems commonly exhibited by children and adolescents with ASD in terms of total, internalizing, and externalizing challenging behavior. Results indicated that presence of sleep problems increased the ratings of challenging behavior across types, as hypothesized. Unexpectedly, degree of sleep problem (i.e., mild versus severe) only affected total and externalizing challenging behavior, whereas ratings of internalizing challenging behavior were not significantly different between mild and severe sleep problem groups. Clinical applications of findings, as well as future directions for additional research on the topic of sleep among individuals with ASD, are discussed.

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1. Introduction

Autism spectrum disorder (ASD), one of the most common neurodevelopmental disorders, is characterized by persistent deficits in social communication and interaction and the presence of restricted, repetitive patterns of behaviors (Fodstad, Matson, Hess, & Neal, 2009; Horovitz & Matson, 2010; Levy & Perry, 2011; Matson & Boisjoli, 2008; Matson, Dempsey, & Fodstad, 2009; Matson, Dempsey, LoVullo, & Wilkins, 2008; Matson, González, Wilkins, & Rivet, 2008; Matson & Wilkins, 2008b; Worley & Matson, 2012). In addition to core symptoms, individuals with ASD are frequently affected by associated problems such as feeding and sleep difficulties, comorbid symptoms, and challenging behaviors (Kozlowski, Matson, Belva, & Rieske, 2012; Matson, Matson, & Beighley, 2011; Simonoff, Pickles, Charman, Chandler, & Baird, 2008; Smith & Matson, 2010a, 2010b, 2010c; Turygin, Matson, Adams, & Belva, 2013). These issues are underscored by the high prevalence of the condition (Matson & Kozlowski, 2011).

Specifically, sleep difficulties are one of the most common associated problems in children with ASD (Cortesi, Giannotti, Ivanenko, & Johnson, 2010; Richdale, 2001). Children with ASD have been reported to have more sleep problems than children who are typically developing (Krakowiak, Goodlin-Jones, Hertz-Picciotto, Croen, & Hansen, 2012; Liu, Hubbard, Fabes, & Adam, 2006; Souders et al., 2009). The most commonly reported sleep difficulties among children with ASD include settling difficulties, decreased sleep efficiency, bedtime resistance, insomnia, night awakenings, nightmares, and daytime sleepiness (Krakowiak et al., 2012; Liu et al., 2006; Richdale, 1999). Additionally, some children with ASD cycle between

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periods of hypersomnia and drastically reduced hours of sleep (Giannotti, Cortesi, Cerquiglini, & Bernabei, 2006). The topic of sleep disturbance in this population, including causes, implications, and treatment options, continues to be an area of interest in the field.

Although engaging in challenging behaviors is not required for a diagnosis of ASD, children with ASD frequently exhibit such behavior (Matson, Dempsey, & Fodstad, 2009c; Matson, Rivet, Fodstad, Dempsey, & Boisjoli, 2009). Challenging behaviors include internalizing behaviors such as self-injurious behavior, unusual play with objects, and stereotypies, and externalizing behaviors such as aggression, tantrums, and property destruction (Horner, Carr, Strain, Todd, & Reed, 2002; Matson, Boisjoli, Rojahn, & Hess, 2009; Matson, Cooper, Malone, & Moskow, 2008; Matson, Mahan, Hess, Fodstad, & Neal, 2010; Symons, Sperry, Dropik, & Bodfish, 2005). Previous researchers have found that challenging behaviors are more common than once believed, with estimates suggesting that up to 94% of children with ASD exhibit at least one challenging behavior (Jang, Dixon, Tarbox, & Granpeesheh, 2011; Matson, Wilkins, & Macken, 2009). Identifying and treating such behaviors is crucial because they may interfere with educational opportunities (Carr, Taylor, & Robinson, 1991; Horner, Diemer, &Brazeau, 1992), social relationships (Matson, Neal, Fodstad, & Hess, 2010; Matson & Wilkins, 2007), and access to normal activities (Matson & Nebel-Schwalm, 2007), thus negatively affecting the overall quality of life of children with ASD and their families (Matson & Rivet, 2008). Furthermore, severe challenging behaviors may pose a threat to the safety of the individual and his or her family members or caregivers (Emerson, 2000; Holden & Gitlesen, 2006).

Abundant research evidence suggests the existence of a relationship between sleep problems and ASD symptoms. More specifically, researchers indicate that sleep problems exacerbate symptoms characteristic of autism (Adams, Matson, Cervantes, & Goldin, 2014; Kozlowski et al., 2012; Matson, Ancona, & Wilkins, 2008; Richdale & Schreck, 2009; Schreck, Mulick, & Smith, 2004), including increased communication and social deficits correlated with sleep problems (Matson, Ancona, et al., 2008; Richdale & Schreck, 2009; Schreck et al., 2004). Given the frequency and severity of both challenging behaviors and sleep difficulties in individuals with ASD, examining the relationship between these problems is imperative. Previously, studies examining this relationship have been conducted using samples of individuals with learning difficulties and intellectual disabilities (ID). For example, Wiggs and Stores (2007) examined sleep difficulties and challenging behaviors in children with severe learning difficulties. The authors found that children with sleep difficulties exhibited significantly more types of daytime challenging behaviors (e.g., irritability, lethargy, hyperactivity, and stereotypic behaviors). Richdale and colleagues (2000) found that sleep problems were significantly associated with the presence of challenging behaviors among children with ID. Similarly, Brylewski and Wiggs (2001) also reported that adults with ID with sleep problems evinced more daytime irritability, stereotypy, and hyperactivity compared to those who did not have sleep difficulties.

Furthermore, Matson, Ancona, and colleagues (2008) reported that adults with ASD who suffered from more severe sleep disturbance engaged in more aggressive behaviors than those with milder sleep problems, and those with more severe sleep problems had a higher frequency of challenging behaviors. However, little is known about this relationship in children with ASD. Should presence or increasing severity of sleep problems be associated with greater ratings of challenging behavior, early identification and treatment for such difficulties may improve quality of sleep and subsequently decrease challenging behaviors. Therefore, the purpose of the current study was to examine this relationship in children and adolescents with ASD.

2. Method

2.1. Participants

Children and adolescents included in the present study were selected from a pre-existing, continually updated database of individuals recruited from schools, outpatient clinics, parent advocacy groups, and family support groups in 16 states. Parent or caregiver informants completed the assessment battery used in the present study, the *Autism Spectrum Disorder Battery, Child Version* (ASD-C; Matson & González, 2007), as a portion of comprehensive evaluations completed by the research team. Only individuals with a recorded diagnosis of ASD were included. The study was approved by the Louisiana State University Institutional Review Board, and parent or caregiver informants provided informed consent before initiating participation.

Inclusion criteria required all participants to have valid data in terms of age, gender, item number 18 on the *Autism Spectrum Disorder-Comorbid-Child Version* (ASD-CC; Matson & González, 2007), and fewer than two omissions on the *Autism Spectrum Disorder-Behavior Problems for Children* (ASD-BPC; Matson & González, 2007). The resulting sample consisted of 311 children and adolescents. Participants were 2–18 years of age (M = 7.95, SD = 3.60). The sample was composed of 80.1% males and 19.9% females, of which 83.1% were Caucasian, 10.6% were African American, 3.1% were Hispanic, 3.1% were of other ethnicity. Demographic data for the overall sample is presented in Table 1.

Participants were further classified into sleep problem groups based upon reported severity of sleep disturbance on the ASD-DC. This is discussed further in Section 2.3.

2.2. Measures

2.2.1. Autism spectrum disorder – child version (ASD-C, Matson & González, 2007)

The *ASD-C* is an assessment battery for the evaluation of children and adolescents 2–18 years of age. The measure is composed of three separate scales, consisting of a total of 97 items, that provide evaluation of diagnostic symptomology of