Title: Associations between Sleep-Related Breathing Disorder Symptoms and Adaptive Functioning In School-Age Children with Down Syndrome

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Introduction: Down syndrome (DS) is associated with numerous medical comorbidities that can have a significant impact on overall quality of life (Hoffmire et al., 2014; Lal et al., 2015). One particular area of concern for this population is the presence of sleep-related breathing disorders (SRBDs), which can produce significant irregularities within the sleep patterns of individuals with DS (Hoffmire et al., 2014). SRBDs represent a fraction of sleep disorders that are characterized by deviations within both respiration and ventilation during the sleep cycle (Hoffmire et al., 2014; Lal et al., 2015, Burman, 2017). There is a growing interest in the presence of SRBDs, such as obstructive sleep apnea, in individuals with DS (Cielo et al. 2016; Hoffmire et al., 2014; Nehme et al., 2017; Brooks et al., 2015). However, more research is needed on the relations between SRBDs and everyday functioning in this group. Thus, the current study sought to examine the relationship between parent-reported SRBD and adaptive functioning within a group of school-age children with DS.

Method: Participants in the current study were a part of a larger research study being conducted at Drexel University. The sample included 28 children with DS who were stratified based on parent report of suspected SRBD on the Pediatric Sleep Questionnaire (PSQ; Chervin et al. 2000). Children with scores above 0.33 were included in the suspected SRBD group (DS+SRBD; n=11; 5 males; mean age: M=11.1+ 3.73); children with scores less than or equal to 0.33 were included in the DS only group (DS only; n=17; 6 males; mean age: M=11.9+3.00). The two groups did not significantly differ on age (p>.5), IQ (p>.8), or sex (p>.5).

In addition to completing the PSQ, parents of participants completed the Vineland Adaptive Behavior Scales – Second Edition (VABS-2; Sparrow et al., 2005), which assesses adaptive functioning, and the Children’s Communication Checklist – Second Edition (CCC-2; Bishop, 2006), which assesses structural and pragmatic language skills.

Results: Group differences on all measures were examined using t-tests. While there were no significant differences in VABS-2 Daily Living Skills (DS+ SRBD M=68.90, DS M=72.00; t=.76, p=.45, d=0.30) or Communication domain scores (DS+ SRBD M=70.40, DS M=71.20; t=.12, p=.45, d=0.06) between the two DS groups, Social domain scores differed significantly (t=2.17, p=.04, d=0.90), such that the DS +SRBD group had significantly lower scores (M=72.60) than the DS only group (M=82.10). To further investigate group differences in social abilities as a function of suspected SRBD, social communication and social relationships were evaluated with a composite of pragmatic language scale scores and the Social Relations scale of the CCC-2, respectively. There were significant differences between the two groups on the pragmatic language composite (t=2.56, p=.016, d=1.01) and on the Social Relations scale (t=2.481, p=.02, d=0.97), such that the DS+SRBD group had significantly lower scores (pragmatic language M=5.39, social relations M=7.27) than the DS only group (pragmatic language M=7.52, social relations M=9.35).

Discussion: The current preliminary investigation of adaptive functioning in school-age children with DS revealed specific concerns in the domain of social functioning for youth with DS and suspected SRBD. These results complement recent research in which concerns about behavior problems in children with DS and poor sleep have been reported (Esbensen et al. 2018). They also bring to the fore the possibility that SRBDs may negatively influence social and communication skills within the DS population. However, given this study’s small sample size and cross-sectional study design, the nature and directionality of the relationship between sleep and social functioning in this group need to be investigated further in future research.
References/Citations: