



# Sleep, anxiety and challenging behaviour in children with intellectual disability and/or autism spectrum disorder

Halina Rzepecka<sup>a</sup>, Karen McKenzie<sup>b,\*</sup>, Iain McClure<sup>c</sup>, Shona Murphy<sup>d</sup>

<sup>a</sup> NHS Tayside, Centre for Child Health, 19 Dudhope Terrace, Dundee DD3 6HH, UK

<sup>b</sup> University of Edinburgh, Teviot Place, Edinburgh EH89AG, UK

<sup>c</sup> NHS Lothian, Royal Hospital for Sick Children, Edinburgh, UK

<sup>d</sup> NHS Fife, Stratheden Hospital, Cupar, Fife, UK

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## ABSTRACT

Children with an intellectual disability (ID) and/or autism spectrum disorder (ASD) are known to suffer from significantly more sleep problems, anxiety and challenging behaviour (CB) than typically developing children (TD), yet little is known about the relationship between these factors in the child ID/ASD population. The study aim was to examine these relationships. We hypothesised that there would be significant positive correlations between the three factors and that sleep problems and anxiety would predict a significant amount of the variance in levels of CB. Parental measures of sleep problems, anxiety and CB were completed by 187 parents of children with ID and/or ASD. Significant positive associations were found between the three factors. A hierarchical multiple regression showed that medication, sleep problems and anxiety accounted for 42% of the variance in CB, with a large effect size. These findings suggest that these relationships should be considered during clinical practice, particularly in the case of CB interventions where sleep problems and/or anxiety are also present.

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## 1. Introduction

Children with an intellectual disability (ID) and/or autism spectrum disorder (ASD) suffer from significantly more sleep problems, anxiety and challenging behaviour (CB) than typically developing (TD) children, yet little is known about the relationship between these factors in the child ID/ASD population. The current study aimed to examine these relationships in a Scottish population.

### 1.1. The relationship between ID and ASD

There are difficulties determining the exact prevalence of children with ID and/or ASD due to differing diagnostic criteria and inclusion/exclusion criteria in studies, as well as the issue of children being unknown to services. There were estimated to be 28,300 children with ID living in Scotland in 2004 (Scottish Executive, 2006). In terms of children with ASD, a recent UK study suggested a prevalence rate of 116.1 per 10,000 in primary school age children (Baird et al., 2006). As ASDs are evident across a range of IQ levels, a child can be diagnosed with both ASD and ID. Recent figures suggest up to 75% of children have a diagnosis of both ID and ASD (Croen, Grether, & Selvin, 2002).

\* Corresponding author. Tel.: +44 0131 651 3953; fax: +44 0131 651 3971.

E-mail addresses: drkmckenzie@hotmail.com, kmckenzi@staffmail.ed.ac.uk (K. McKenzie).

## 1.2. Sleep problems

The multiple functions of sleep include physical and psychological rehabilitation, energy conservation, brain growth, and consolidation of memories (Stores, 2001). Unsurprisingly, sleep deprivation can have a range of negative impacts on children including impairments in memory, learning, vigilance, creative thought, verbal abilities and attention (Fallone, Acebo, Seifer, & Carskadon, 2005; Gozal, 1998). These may impact on academic performance and would be particularly detrimental to children who already had difficulties in these areas (Blunden & Chervin, 2008). A child's sleep problems can also add to the stress of caring for a child with an ID and/or ASD (e.g. Hoffman et al., 2008).

Sleep disorders can be distinguished from sleep problems. Stores and Wiggs (2001) suggest that there are three primary categories of sleep problems: difficulty getting to sleep or staying asleep; sleeping too much; and disturbed episodes that interfere with sleep. There are also three primary classifications of sleep disorders: dysomnias are sleep disorders which cause difficulty getting to sleep, staying asleep, or excessive daytime sleepiness; parasomnias are sleep disorders which disrupt the sleep process once an individual is asleep; and sleep disorders which are associated with neurology or other medical disorders.

### 1.3. Sleep problems in children with ID and/or ASD

There is a high prevalence of sleep problems in children with both ID and ASD, with estimated prevalence rates being found by some authors to be as high as 77–86% (Bartlett, Rooney, & Spedding, 1985) and 73% respectively (Polimeni, Richdale, & Francis, 2005). Significantly more sleep problems have been found in the children with ID and ASD when compared to typically developing children (Allik, Larsson, & Smedje, 2006; Honomichl, Goodlin-Jones, Burnham, Gaylor, & Anders, 2002; Patzold, Richdale, & Tonge, 1998; Richdale, Frances, Gavidia-Payne, & Cotton, 2000). This finding may be because of the association with particular syndromes, e.g. Down Syndrome (Miano et al., 2008), Prader–Willi Syndrome (Clift, Dahiltz, & Parkes, 1994) and conditions such as epilepsy (Giannotti et al., 2008) or sensory difficulties (Carvil, 2001). Issues such as parental stress resulting in ineffective or inconsistent parenting strategies (Hoffman et al., 2008) and social/communication difficulties (Richdale, 1999) can also impact on sleep problems in these groups.

### 1.4. Anxiety

Anxiety has a negative impact on the child and their family (Berg, Turid, Vikan, & Dahl, 2002), however, there is limited research into anxiety in individuals with ID and/or ASD (Arthur, 2003). Prevalence rates can be as high as 84% (e.g. Muris, Steerneman, Merkelbach, Holdrinet, & Meesters, 1998) and have been found to be significantly higher than in TD populations (e.g. Emerson & Hatton, 2007). As well as being associated with particular syndromes, e.g. Fragile X syndrome (Bregman, Leckman, & Ort, 1998) or Williams Syndrome (Dykens, 2000), anxiety is also associated with a number of factors which are more common in the ID/ASD population. These include dysregulation of neurotransmitters (Corbett, Mendoza, Abdullah, Wegelin, & Levine, 2006); insecure attachment (Wallander, Dekker, & Koot, 2006); exposure to negative life events (Hurbert-Williams & Hastings, 2008) and limited social networks (Greenham, 1999).

### 1.5. Challenging behaviour

Individuals displaying CB can be at an increased risk of abuse, inappropriate treatment, neglect and exclusion from community and social situations (Emerson, 2001). The term 'challenging behaviour' is used frequently in the literature to describe behaviour which is considered to be culturally abnormal, places the individual and/or others at risk, and results in the individual being denied access to ordinary facilities (Emerson, 2001). Total population studies have shown prevalence of CB in ID to be around 10–15% (Emerson et al., 2001). When examining specific forms of CB in children, studies have shown prevalence rates of up to 60% (e.g. Adams & Allen, 2001).

Children can engage in multiple forms of CB (Emerson & Bromley, 1995; Lowe et al., 2007) from a young age (Hartley, Sikora, & McCoy, 2008), and a diagnosis of ASD in addition to ID has been shown to lead to increased risk of CB (Murphy et al., 2005). The exact prevalence is uncertain due to different assessments and definitions of CB (Emerson et al., 2001), but is significantly more common in children with ID/ASD compared to TD children (Baker et al., 2003). CB is associated with particular syndromes such as Smith Magenis Syndrome, Down Syndrome and Prader–Willi Syndrome (Dykens, 2000, 2007; Reddy & Pfeiffer, 2007) and is related to IQ levels (Emerson & Bromley, 1995); reinforcement (Emerson, 1998); parental stress (Baker et al., 2003); and communication difficulties (Hartley et al., 2008).

### 1.6. The relationships between sleep problems, anxiety and CB

A positive association between sleep problems and anxiety has been found in TD children (e.g. Alfano, Beidel, Tuner, & Lewin, 2006; Alfano, Ginsburg, & Kingery, 2007). It might be expected that a similar relationship, whether causal or bi-directional (Alfano et al., 2006), would exist between sleep problems and anxiety in children with ID and/or ASD. Anxiety is known to be accompanied by physiological and cognitive arousal (El-Sheikh, Buckhalt, Granger, & Keller, 2008) neither of which provide a basis for restful sleep. Likewise, sleep deprivation for parents may impair the ability to effectively deal with the child's difficulties (Hoffman et al., 2008). Zarowski, Mojs, Mlodzilowska-Albrecht, and Steinborn (2006) found a positive

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