



Is Bullying Associated with Emerging School Refusal in Autistic Boys?

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Abstract

The experience of being bullied is widespread among autistic youth. Relatively little empirical work has been done on the relationship between the bullying of these youth and school refusal (SR). This study of 67 school-age autistic boys ($M = 11.7$ years, $SD = 2.3$ years) examined several factors that may contribute to SR. Data regarding boys' age, generalised anxiety disorder (GAD), major depressive disorder (MDD), key ASD diagnostic criteria, and frequency of being bullied were collected. Results indicated that, while boys displaying emerging SR also had significantly higher GAD and MDD than boys without emerging SR, only the frequency of being bullied made a significant contribution to emerging SR. Implications for prevention and treatment of SR among autistic youth are discussed.

Keywords Autism · Bullying · School refusal · Anxiety · Depression

Introduction

Young people with Autism Spectrum Disorder (ASD) often suffer from comorbid anxiety and depression (van Steensel and Heeman 2017; White et al. 2009; Wigham et al. 2017). As well as being intrinsically unpleasant, these conditions can have detrimental effects on chronic disease and overall mental and physical health (Fries et al. 2005; Moussavi et al. 2007; Nutt 2004). They can also impede learning and educational achievement because they interfere with the kind of social interaction that is often inherent in education (Chang et al. 2012). Difficulty with social communication and reciprocal social interaction is a major diagnostic indicator of ASD (APA 2013) and therefore a problem for many of these young people, even before these impairments in social communication and interaction are further exacerbated by elevated anxiety and depression (Pickard et al. 2017). Thus, the interaction between anxiety, depression, and social interaction represents a potential research focus in regard to school attendance and academic progress among autistic youth.

One socially-based source of anxiety and depression in autistic boys is the experience of being bullied at school. According to a recent meta-analysis, being bullied occurs for about 44% of school-age autistic youth (Maïano et al. 2016). Bullying can take several forms, including verbal or physical attacks and social exclusion, and may occur via direct interaction and electronically (Menesini and Salmivalli 2017). In the general population, it has been demonstrated that being bullied during childhood can almost double the likelihood of requiring psychiatric treatment during adulthood (Sourander et al. 2016). Qualitative studies of autistic youth who attend mainstream schools attest to the stress these young people experience as a result of being bullied (Goodall 2018).

One particularly important consequence of bullying among autistic youth that is directly related to academic progress is the desire to avoid re-entering the environment where the bullying occurred (Bitsika and Sharpley 2014). Related to this, it was found that school engagement among autistic youth decreased in part because of conflict with non-autistic peers (Goodall 2018). Furthermore, a study with depressed adults suggests associations between autism, being bullied, and school absenteeism (Takara and Kondo 2014). Autistic youth who are bullied may thus be at risk for the development of attendance problems, especially school refusal (SR).

SR is said to occur when a young person is reluctant or refuses to attend school due to emotional distress observed in, for example, excessive fearfulness, depressive affect,

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temper tantrums, or unexplained physical symptoms (Heyne et al. 2019). It is differentiated from truancy because the young person does not hide the school absence from their parents. It is also important to note that SR is not equivalent to ‘school refusal behaviour’, a term sometimes used to refer collectively to various forms of youth-motivated absenteeism, including both SR and truancy (Heyne et al. 2019).

Between 1–7% of the general population and 5–16% of clinic-referred youth display SR (Egger et al. 2003; Havik et al. 2015a; Heyne and King 2004; Steinhausen et al. 2008). Even though SR is not *defined* by absence from school, it is often *associated with* absence, which negatively impacts academic achievement (Gershenson et al. 2017; Gottfried 2014) and socioemotional outcomes (Gottfried 2014; Malcolm et al. 2003). Associations are also found between absenteeism and self-harm and suicidal ideation (Epstein et al. 2019). Anecdotally, SR has been linked with reduced quality of life for the young person (Torrens Armstrong et al. 2011) and stress for the family (Bryce and Baird 1986). The absenteeism often accompanying SR also places an extra burden upon school staff (Balu and Ehrlich 2018; Thornton et al. 2013).

SR seems to be common among autistic youth. In Japan, Kurita (1991) investigated the occurrence of SR among youth with autism or another pervasive developmental disorder (PDD) based on parent-reported data. SR was operationalized as absence from school due to the youth’s reluctance to attend, staying at home with the knowledge of the parents, and the absence of significant antisocial disorders. Twenty-seven percent of the 110 youth with autism or another PDD in that study met the criteria for SR. There were also youth in the sample who showed an unwillingness to attend school that did not result in actual absence, which may be conceptualized as ‘emerging’ SR (Ingul et al. 2019). In England, Totsika and colleagues (accepted) studied parent-reported reasons for school absence among 486 autistic youth. SR was measured via the parent-reported item ‘My child was reluctant or refused’ to attend school on any day during a specified month. SR was the most frequent reason for absence (43% of all absences), followed by non-problematic absences (e.g., absence due to a medical appointment: 32%), school withdrawal (9%), school exclusion (9%), and truancy (less than 1%).

Like autism, SR is linked to anxiety, depression, and bullying. Anxiety and/or depressive disorders are diagnosed in about one-half of youth referred for treatment of SR (Heyne et al. 2015). These conditions were also prominent in Egger et al.’ (2003) community-based study of school attendance problems among USA youth. When compared with youth who showed no attendance problems, youth displaying SR at a mild level were significantly more likely to have separation anxiety disorder (11 times more likely), generalized anxiety disorder (3 times), specific phobia (11 times), and social

anxiety disorder (7 times). These youths reported having fears specific to the school (36%), worry about harm occurring to parents (18%), and fear of what would happen at home while attending school (17%). Youth displaying mild SR were also 10 times more likely to meet the diagnostic criteria for a depressive disorder. Symptoms included trouble falling or staying asleep (32%) and fatigue (12%). Bullying is reported anecdotally by young people presenting with SR (e.g., Brouwer-Borghuis et al. 2019; Place et al. 2002) and by their parents (e.g., Havik et al. 2015b), and empirical studies reveal the extent of the relationship. For example, Egger et al. (2003) found that 29 percent of youth displaying mild SR were bullied or teased. The odds ratio for having been teased or bullied was 2.6 compared to youth without an attendance problem. Havik et al. (2015b) also found an association between SR and being bullied, the relationship being stronger for primary school students than for secondary school students.

It is possible that bullying-induced ambivalence about being at school may contribute to SR in autistic youth, but this particular pathway to SR has not been examined in comparison to other factors associated with autism, such as anxiety and depression. Indeed, no study has compared a range of factors that may be associated with SR in autistic youth. As noted by Totsika et al. (accepted), “studies are required to examine a wider range of potential correlates of SR, including anxiety and depression” (p. x).

Some of the variables that might be correlates of SR in autistic youth—alongside bullying—are age, ASD symptom profile, and levels of anxiety and depression. Kurita (1991) found that SR was more prevalent among autistic students in secondary school relative to those in elementary school, but age was dichotomised on the basis of school level rather than examining the whole range of ages across youth in that study. Data regarding the presence or absence of ASD symptoms derived from parents’ reports on diagnostic instruments such as the Social Responsiveness Scale (Constantino and Gruber 2012) can provide valuable information about the presence of specific symptoms. However, such information does not represent the degree to which those symptoms affect the child. For example, some symptoms may be more likely to render the autistic youth the target of bullying by their non-autistic peers. Indeed, some aspects of social interaction have been associated with school refusal behaviour in autistic youth (Munkhaugen et al. 2019). It is valuable to determine if the other core ASD diagnostic criterion of Restricted and Repetitive Behaviour is also related to SR in autistic youth. Although, as mentioned above, some data have been reported about the association between SR and separation and social anxiety in non-autistic youth, and these forms of anxiety are also reported in autistic youth, the most common form of anxiety in those autistic youth is Generalised Anxiety Disorder (GAD) (Bitsika and Sharpley

2015a, b). Depression may also take several forms, but the most common is Major Depressive Disorder (MDD). Further, although much research into anxiety and/or depression uses total scale scores to classify participants, analysis of the association between the individual symptoms of those disorders and SR has the potential to identify which aspects of anxiety and depression are more powerfully associated with SR. Finally, it is relevant to consider how often autistic youth are bullied to determine if greater amounts of bullying are associated with higher rates of SR.

Therefore, the current study aimed to explore the role of bullying in emerging SR among autistic youth. Potential correlates of SR were also investigated, to better understand the effect of bullying per se upon emerging SR. The potential correlates that were examined were: (i) the frequency of having been bullied, (ii) the autistic youth's age, (iii) their parents' ratings of the degree of difficulty that their autistic child's ASD-related characteristics caused the child, and (iv) the autistic youth's anxiety and depression at total scale and also at the individual item levels. Autistic males were selected as participants because of the preponderance of males identified with ASD, often quoted as about 4:1 (APA 2013), and because this study is part of an ongoing research programme into autistic boys. It also allows for control of possible sex effects at this initial stage of research. To ensure that youth of school attendance age was included, a sample of autistic boys aged 6 years to 18 years was selected. Based on our foregoing description of the relationships between SR and bullying, age, ASD characteristics, anxiety, and depression, it was hypothesized that these four sets of potential correlates of SR would be significantly associated with SR in autistic boys of school age.

Methods

Participants

Participants were recruited for a study “about bullying in boys with an autism spectrum disorder, particularly how children and adolescents perceive, make sense of, and respond to bullying”. Recruitment was conducted via email to ASD parent organisations on the Gold Coast, Australia. Parents responding to this invitation were screened to ensure the autistic child was attending a mainstream school and had an IQ of at least 70 (i.e., above ‘mildly impaired’), and was male. A total of 67 mothers and their autistic sons responded to this recruitment process and met the screening criteria. There was no intention to select only mothers so the absence of fathers was coincidental. The boys' ages ranged from 7 to 18 years ($M = 11.7$ years, $SD = 2.3$ years) and they were in grades two (elementary school) to 11 (senior high school) in mainstream schools. All of the boys had

received a formal diagnosis of ASD from a psychiatrist or paediatrician. This diagnosis had been confirmed prior to the study by a nationally-registered clinical psychologist who had a PhD in the assessment and treatment of ASD and who had several decades' experience in diagnosis and treatment of ASD in children and adolescents (author VB). The diagnostic interview protocols used in this process focussed upon developmental history, symptoms of ASD (from DSM-based criteria), including the presence of impairments in social interaction and social communication, and repetitive and restricted behaviours and interests. Symptoms of ASD were referenced to the developmental history of the participants and the social context in which their ASD symptoms occurred. All diagnoses were confirmed by behavioural observation conducted by the clinical psychologist. This diagnostic process is the accepted and required standard for identification of autism conditions in Australia, where the use of the ADOS and ADI-R is recommended only when there is uncertainty regarding the relevance of an autism diagnosis (there was no such uncertainty for any of the autistic participants in this study).

Measures

A questionnaire package consisted of three parts. The first part elicited data from mothers about: the age of their son; their son's difficulty in regard to each of the two major diagnostic criteria for ASD (Socialising and Communicating, Restricted and Repetitive Behaviours), rated as ‘minimal’, ‘slight’, ‘moderate’, ‘severe’, or ‘very severe’; and whether their son had reported being bullied (yes/no). The second part comprised three questions about the experience of being bullied at school, to be completed by the autistic boys. These questions were developed following 10 individual face-to-face interviews with another sample of autistic boys (described in Bitsika and Sharpley 2014). They included whether the boy had been bullied (yes/no), frequency of being bullied (not often = 1, sometimes = 2, nearly every day = 3), and whether they asked their parents if they could stay home from school the next day because of being bullied (yes/no). This third question was used to classify the presence or absence of emerging SR. The third part of the questionnaire package consisted of two standardised scales, namely the Generalised Anxiety Disorder (GAD) and Major Depressive Disorder (MDD) sections of the Child and Adolescent Symptom Inventory-revision 4 (CASI-4), described below.

The CASI-4 (Gadow and Sprafkin 2010; Gadow et al. 2002) was developed from the Child Symptom Inventory-4th revision (Gadow and Sprafkin 2010) and the Youth's Inventory (Gadow et al. 2002), based upon DSM-IV-TR criteria. It has been used in a norming study of 103 autistic children (Gadow et al. 2005) and another sample of 67 autistic

children (Weisbrot et al. 2005). Normative data for the entire CASI-4 and for the subscales, based on samples of autistic children, are described in the CASI-4 Test Manual and elsewhere (Gadow and Sprafkin 2010; Gadow et al. 2002). Psychometric data are satisfactory (Gadow and Sprafkin 2010), with test–retest reliability of $r = 0.67$ ($p < 0.001$) over a six-week period and internal consistency of 0.74 (Gadow and Sprafkin 2010). Participants may respond to the CASI-4 questionnaire items with an assessment of 0 (never), 1 (sometimes), 2 (often), or 3 (very often), thus providing a more detailed measure of severity than categorical assessment procedures. Responses are those that “best describe this youth’s overall behaviour”.

The CASI-4 includes several anxiety subscales, one of which measures the diagnostic indicators of GAD in children as described in the DSM-5 (APA 2013). This subscale consists of 8 items which measure attention difficulties, being worried, having difficulty controlling worries, feeling restless or on edge, feeling irritable, feeling tense, having difficulty sleeping, and feeling tired for no reason, all of which are answered via the four-point scale described above for the CASI-4 in general. Total scores range from 0 to 32 for this subscale. Additionally, the CASI-4 includes 11 symptoms of MDD, seven of which measure symptoms of irritability, feeling sad or depressed, anhedonia, thoughts of death or suicide, feeling worthless or guilty, and fatigue (scored in the same four-point scale described above, giving a total subscale score ranging from 0 to 21), and four items that refer to changes in respondents’ eating, sleeping, concentration and mental outlook habits, which are answered with a ‘yes’ or ‘no’ (scored as 1 or 0 respectively, providing a subtotal from 0 to 4, which is added to the seven-item subtotal). Psychometric qualities of these two subscales are similarly acceptable as those reported for the entire CASI-4 above.

Many researchers collect ratings of an autistic child’s GAD and MDD from parents and other caregivers, and some also collect self-ratings of GAD from autistic children and adolescents using the CASI (Lecavalier et al. 2009). A previous study demonstrated stronger correlations between autistic boys’ self-ratings of their GAD on the CASI-4 and their salivary cortisol than were found for parent’s ratings of their sons’ GAD and the boys’ cortisol (Bitsika et al. 2014). Another study by the same group showed that there was a significant correlation between self-ratings of GAD on the CASI among autistic boys as young as 7 years of age (Bitsika et al. 2015). Autistic children can self-evaluate their social interaction strategies (Sainato et al. 1992) and appropriate play behaviours (Stahmer and Schreibman 1992), and also have some ability to access and understand their own emotions (Capps et al. 1995) including loneliness (Bauminger and Kasari 2000), anxiety (Kuusikko et al. 2008; Lopata et al. 2008), and depression (Vickerstaff et al. 2007). Self-reporting of anxiety and depression has been

used with satisfactory validity and reliability in previous studies of autistic children and adolescents (Bellini 2004, 2006; Bitsika and Sharpley 2015a, b; Gadow et al. 2005, 2002). These findings suggest that the data from self-reports of GAD and MDD could provide valuable insights into the anxiety and depression states of young autistic people.

Procedure

Ethical approval for this study was obtained from the Bond University Human Research Ethics Committee (BUHREC). All participants were informed that the responses they and their sons gave would be kept confidential, and that only aggregated and thus anonymised data would be reported. Parents expressing interest in the study were given an online address to access the questionnaire. This was set up so that the parents’ and sons’ data could be collected in tandem (although discretely from each other) and linked via the online data-collection system. This provided a means of validating sons’ self-reports against mothers’ reports for several variables. To increase the likelihood that it was the boys and not the parents who responded to the questions for the boys, parents were asked to “supervise your child when he completes the questionnaires but do not answer the questions for him.”

Statistical Analyses

Data were downloaded from the online data-collection service and analysed by SPSS version 25. The CASI-4 GAD and MDD subscales were tested for normality. Correlational analysis (Pearson and Spearman) and logistic regression were used to test the hypothesised associations between emerging SR and the four sets of target variables. A priori power analysis indicated that a sample of 49 participants would be sufficient to detect a correlation of 0.45, and 51 participants would be sufficient to detect an odds ratio of 3.1 via logistic regression, both with $p = 0.05$ and power of 0.95.

As a preliminary analysis, Pearson correlations were calculated for the association between age and CASI-4 GAD or MDD scores to determine if age influenced anxiety and depression severity. After the boys had been regrouped according to whether they reported emerging SR due to having been bullied at school, MANOVA was used to explore differences between age and CASI-4 GAD and MDD scale scores for those autistic boys who reported emerging SR versus those who did not. Chi-square statistics tested for differences in mothers’ reports of their sons’ ASD-related areas of difficulty (i.e., Socialising and Communication, Restricted and Repetitive Behaviours) and sons’ reported frequency of being bullied, between the autistic boys who reported SR and those who did not. MANOVA was also used to test for the presence of any specific CASI-4 GAD or MDD

item score differences between these two subgroups of boys. Spearman correlations were calculated for the association between emerging SR and those CASI-4 GAD and MDD items that showed significant differences across the two subgroups of boys. Finally, as the main analysis comparing the factors under investigation, logistic regression tested for the contributions made to emerging SR status (i.e., whether the boys asked their parents if they could stay home from school the next day because of being bullied) by the four sets of variables (age, ASD-related characteristics, anxiety and depression, and frequency of being bullied). ANOVA was used to identify which levels of being bullied were most likely to influence SR status.

Results

Data

Of the 67 boys recruited, 57 (85.1%) reported that they had been bullied at school. By comparison, 58 mothers reported that their sons told them they had been bullied, but these two subgroups were not completely congruent (48 mother-son pairs agreed). This contradiction was resolved in favour of the self-reports of the boys because some boys may not have told their parents that they were being bullied. Thus, analyses were conducted using the sample of 57 autistic boys who reported that they had been bullied.

The descriptive statistics for age, severity of ASD-related characteristics that each mother thought caused their son's difficulty, CASI-4 GAD and MDD scales, and frequency of being bullied are shown in Table 1. Both the Kolmogorov-Smirnoff and Shapiro-Wilk statistics were not significant for the two CASI-4 scales, and no transformation was required. There was a significant Pearson correlation between the two CASI-4 scales ($r=0.856$, $p<0.001$) but not between age and

CASI-4 scale GAD ($r=-0.203$, $p=0.130$) or between age and CASI-4 scale MDD ($r=-0.135$, $p=0.318$) at the Bonferroni-corrected p value of $0.05/2=0.025$. Further, there was no significant Spearman correlation between age and SR ($\rho=-0.241$, $p=0.071$). Thirty-two (56.1%) of these 57 autistic boys who reported being bullied also reported that they had asked their parents if they could stay at home from school for the next day as a result of having been bullied. This categorisation between emerging SR (hereafter SR) and no emerging SR (hereafter non-SR) was used to form two distinct groups for a MANOVA to test for the presence of significant differences in the GAD and MDD symptom profiles of these two subgroups of autistic boys.

Comparison of SR and Non-SR Subgroups on Age and Scores on GAD and MDD

There was a significant main effect $F(3,53)=3.265$ (Wilks Lambda), $p=0.028$ partial eta squared=0.156, which is a 'large' effect size (Cohen 1988), but no significant univariate difference between the SR and non-SR subgroups with respect to age (see Table 2). There were significant univariate effects for GAD and MDD at the adjusted p value of $0.05/2=0.025$ (adjusted because GAD and MDD are related constructs), as shown in Table 2 where the SR subgroup had higher GAD and MDD total scores than the non-SR subgroup.

However, these results represent the cumulative effect of the 8-item CASI-4 GAD and 10-item CASI-4 MDD scales, and they do not indicate any differences associated with specific GAD or MDD symptoms. Figure 1 displays the relative mean scores for the GAD and MDD items for the two subgroups of autistic boys (SR and non-SR). Although it is apparent that the SR subgroup had consistently higher GAD and MDD item scores than the non-SR subgroup, this figure does not identify which of those differences met the criteria for statistical significance.

Table 1 Descriptive variables for 57 autistic boys who reported being bullied at school

Variable	Mean	SD	Minimum	Maximum
Age (year)	11.6	2.4	7	18
Difficulties with socialising and communication ^a	2.7	.8	1	4.5
Difficulties with restricted and repetitive behaviours ^a	2.9	.8	1	5
GAD score	9.5	5.9	0	22
MDD score	9.9	5.0	0	19
Frequency of being bullied ^b	2.2	.8	1	3

GAD Generalised anxiety disorder, MDD major depressive disorder

^a'minimal' = 1, 'slight' = 2, 'moderate' = 3, 'severe' = 4, or 'very severe' = 5

^b'not often' = 1, 'sometimes' = 2, 'nearly every day' = 3

Table 2 Univariate effects on GAD and MDD scale scores across autistic youth with and without emerging school refusal

Variable	Emerging school refusal ($n=32$) M (SD)	No emerging school refusal ($n=25$) M (SD)	F	p	η^2
Age (year)	12.32 (2.76)	11.03 (2.02)	3.720 ^a	.059	.068
GAD ⁴	11.07 (5.13)	7.35 (6.41)	5.501 ^b	.023 ^c	.097
MDD ⁵	11.47 (4.98)	8.04 (4.53)	6.636 ^b	.013 ^c	.116

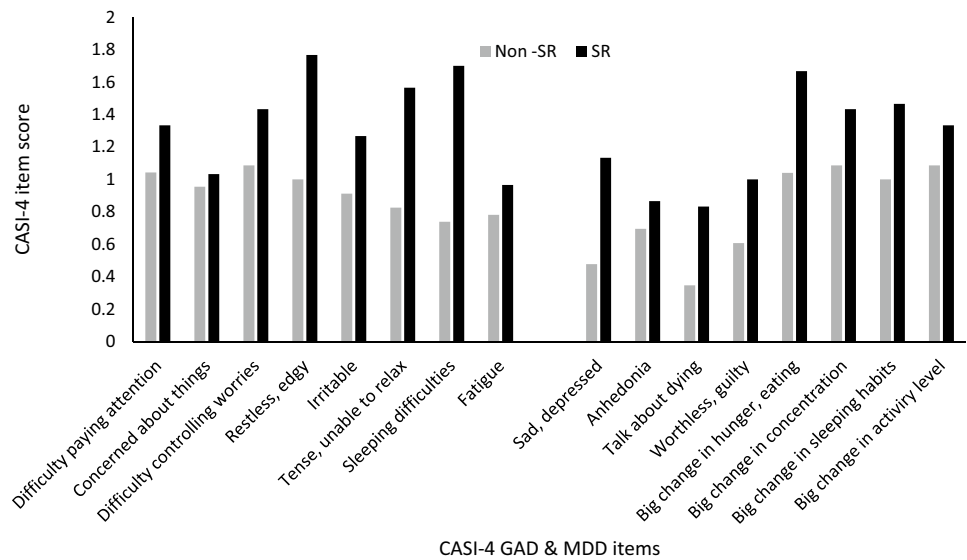
GAD Generalised anxiety disorder, MDD major depressive disorder

^a $df=1,52$

^b $df=2,50$

^cAdjusted $p<.025$

Fig. 1 GAD and MDD item scores for autistic youth with emerging school refusal (SR) and no emerging school refusal (non-SR)



Therefore, separate MANOVAs were run on the GAD items and the MDD items across the SR and non-SR subgroups. Table 3 presents results for those items that showed significantly different scores across sub-groups (at the Bonferroni-adjusted level of $0.05/8 = 0.00625$ for the 8 GAD items, and 0.005 for the 10 MDD items).

Somatic content is common to the three CASI-4 items shown in Table 3. First, autistic boys who asked their parents if they could stay at home due to bullying reported significantly higher levels of feeling tense and being unable to relax than autistic boys who did not ask to avoid school. Second, the boys reported sleeping difficulties. Third, the boys reported a big change in their sleeping habits. Not surprisingly, Spearman’s *rho* revealed that scores on all three items were strongly correlated with the SR boys’ desire to avoid school (*Extremely tense and unable to relax*: $\rho = 0.386, p = 0.004$; *Difficulty sleeping*: $\rho = 0.387, p = 0.004$; and *Having experienced a big change in sleeping habits*: $\rho = 0.429, p = 0.001$). These

associations indicate that each of these CASI-4 items accounted for between 14.9% and 18.4% of the variance in SR.

Comparison of SR and Non-SR Subgroups on ASD-Related Difficulties and Frequency of Being Bullied

Chi-square analyses were performed on the categorical variables of mothers’ evaluations of their son’s difficulties with ASD-related diagnostic criteria, plus the boys’ reports on frequency of being bullied. There were no significant differences between the SR and non-SR groups on mothers’ evaluation of their sons’ difficulty with Socialising and Communicating (Chi-square (4) = 4.829, $p = 0.305$) or Restricted and Repetitive Behaviours (Chi-square (4) = 3.156, $p = 0.076$). However, the Spearman correlation between the boys’ frequency of being bullied and the mothers’ evaluations of the degree of difficulty their sons had with their Restricted and Repetitive Behaviours was significant ($\rho = 0.348, p = 0.008$),

Table 3 Univariate effects of GAD and MDD item scores showing statistically significant differences across autistic youth with and without emerging school refusal

GAD items in CASI-4 ^a	Emerging school refusal <i>M</i> (SD)	No emerging school refusal <i>M</i> (SD)	<i>F</i> ^b	<i>P</i> ^c	η
Extremely tense, unable to relax	1.567 (.897)	.826 (.724)	8.152	.0060	.138
Difficulty sleeping	1.700 (1.207)	.739 (.136)	8.666	.005	1.45
MDD item in CASI-4					
I have experienced a big change in my sleeping habits	1.467 (.571)	1.000 (.426)	10.737	.002	.174

GAD Generalised anxiety disorder, MDD major depressive disorder

^aChild and Adolescent Symptom Inventory-4th ed

^b*df* = 1,52

^cAdjusted $p < .00625$ for the CASI-4 GAD items, and $p < .005$ for the CASI-4 MDD items

but this was not the case for the boys’ difficulty with Socialising and Communicating ($\rho=0.228, p=0.088$). As shown in Fig. 2, 83.3% of the SR boys reported that they were bullied “nearly every school day”, whereas only 16.7% of the non-SR boys reported this frequency of being bullied (Chi-square (2) = 13.987, $p=0.001$).

Contributors to Emerging SR

The next step in the data analysis was to investigate the relative contributions that the four sets of variables made to emerging SR. Rather than reduce statistical power by examining each of these variables separately, they were entered into a logistic regression equation together, with SR vs non-SR as the binary categories. The Omnibus Test of the model was significant (Chi-square (7) = 24.259, $p=0.001$), supported by the Homer and Lemeshow Test (Chi-square (8) = 1.870, $p=0.985$); 75.4% of the cases were correctly classified. The Cox and Snell R square was 0.347 and the Nagelkerke R Square was 0.465, indicating that between 35 and 47% of the variance in emerging SR was explained by the four sets of variables. Sensitivity of the model was 72.0% and specificity was 78.1%. The positive predictive value of the model was 81.5%, indicating that this combination of variables would correctly identify

over 4/5 of the boys reporting the desire to avoid school because of bullying.

However, as seen in Table 4, only the frequency of being bullied contributed significantly to SR status. The Exp(B) value for this variable provided an odds ratio of 4.367 for the likelihood that being bullied was also linked to emerging SR, and the 95% CI suggests that the true value for this odds ratio was at least 1.6, and up to 11.8. Thus, being bullied ‘almost every school day’ was significantly and meaningfully associated with an increased likelihood of these autistic boys asking their parents if they could avoid school the next day due to having been bullied. To more precisely identify the association between being bullied and emerging SR, we examined these variables separately from the other variables in the logistic regression equation. The Spearman correlation coefficient between being bullied and emerging SR was $\rho=0.460, p=0.001$, which equates to a power of 5.35, described by Cohen (1988) as a very large effect.

There were three response categories from which the boys could choose when asked if they were bullied: ‘Not often’, ‘Just sometimes’, and ‘Nearly every school day’. An ANOVA was run on the boys’ responses to whether they had asked their parents if they could avoid school so that any effects due to the frequency of being bullied could be determined. There was a significant overall effect $F(2,52) = 6.724, p=0.003, \eta^2=0.212$. Scheffe *post hoc* comparisons revealed that those boys who reported that they were bullied ‘nearly every school day’ also had a significantly higher likelihood of emerging SR (i.e., asking to avoid school the next day) than boys who reported that they were ‘not often’ bullied (mean difference = 0.5682, $p=0.004$). There was also a non-significant trend towards a higher likelihood of reporting emerging SR than boys who were bullied ‘just sometimes’ (mean difference = 0.3445, $p=0.062$). There was no significant difference in the SR status (i.e., emerging SR or no emerging SR) of boys who were bullied ‘just sometimes’ compared to those who were ‘not often’ bullied (0.2237, $p=0.414$).

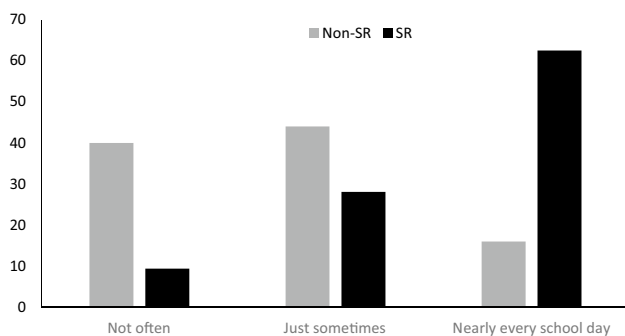


Fig. 2 Frequency of being bullied for autistic youth with emerging school refusal (SR) and no emerging school refusal (non-SR)

Table 4 Results of the Logistic regression on emerging school refusal status

Variable	B	SE	Wald	Significance	Exp(B)	95% CI	
						Lower	Upper
Age	-.229	.163	3.362	.167	.741	.539	1.021
Socialising and communication	-.666	.510	1.709	.191	.514	.189	1.395
Restricted and repetitive behaviours	.482	.445	1.171	.279	1.619	.677	3.873
Frequency of being bullied	1.474	.508	8.431	.004	4.367	1.614	11.810
GAD score	-.026	.123	.046	.829	.974	.766	1.238
MDD score	.178	.146	1.496	.221	1.195	.898	1.589
Constant	-1.519	2.188	.482	.487	.219		

GAD Generalised anxiety disorder, MDD major depressive disorder

Discussion

Over four-fifths of autistic boys in the current study reported that they had been bullied at school, a rate higher than reported in a recent meta-analysis (Maïano et al. 2016). More than half of the boys who reported being bullied asked their parents if they could avoid going back to school the next day because of bullying. There was a significant association between the request to avoid school and the presence and frequency of being bullied. Furthermore, being bullied explained more of the variance in emerging SR than did the boys' age, ASD-related difficulties (judged by their mothers), and self-reported anxiety and depression. Although this study does not permit causal conclusions, the relative frequency of being bullied, plus the fact that being bullied was the sole statistically significant contributor to emerging SR, identify it as a potential major 'predictor' of emerging SR among autistic boys.

The lack of a significant association between the boys' age and the emergence of SR differs from previous reports of autistic youth displaying SR (Kurita 1991) or school refusal behaviour (Munkhaugen et al. 2019). One way of understanding this lack of a significant age-related effect is to consider the possible effects of dichotomising age. That is, those previous significant age-related effects were based on classifying participants by their enrolment at elementary school or high school. As noted by Cohen (1983), dichotomisation may not represent the most accurate way to deal with age as a variable. When age is analysed as a continuous variable in association with other variables, the true association between age and SR might be more accurately displayed. A second explanation for the lack of an age-related effect is that the current study addressed emerging SR whereas Kurita (1991) reported on autistic youth who had actually missed school, 40% of whom were absent from school for at least one month. The age at which youth are referred for treatment of SR will vary from the age at which SR first emerges. Being in high school did not increase the likelihood, at the total sample level, that these autistic boys reported being bullied. This resembles Havik and colleagues' (2015b) finding that SR was associated with bullying among primary and secondary school youth, but the relationship was stronger among primary school youth. Indirectly, this suggests that efforts to prevent and reduce bullying need to be targeted at both school levels.

The univariate analyses indicated that boys with emerging SR were more anxious and depressed than boys without emerging SR. This could be interpreted to mean that these aversive states are in some way associated with SR but, without further investigation of the temporal sequence of those states and emerging SR, it is not possible to

suggest any estimate of causality. Further research is required to determine whether bullying aggravates anxiety or depression, or whether those mental health conditions mediate the relationship between bullying and SR among autistic youth.

There was no significant association between the boys' difficulties related to the major features of ASD (as evaluated by their mothers) and emerging SR. Nevertheless, there was a significant association between their difficulty with Restricted and Repetitive Behaviours and the frequency of being bullied. It may be that this aspect of ASD-related symptomatology is a target for bullying by non-ASD peers, but bullying related to this aspect of ASD is not experienced as sufficiently aversive to drive the autistic boys to seek to avoid school. It is surprising that difficulty with Socialising and Communicating was not significantly associated with the frequency of being bullied or with emerging SR, given that Munkhaugen et al. (2019) found that mothers' responses to the Social Responsiveness Scale were linked with school refusal behavior. However, Munkhaugen and colleagues' sample may have included truanting youth not displaying SR, and their study did not measure the frequency of being bullied.

Taken together, the findings of the current study can inform thinking about treatment and prevention of SR among autistic youth. Regarding treatment, SR interventions often include those aimed at helping youth manage anxiety and depression (e.g., Heyne and Sauter 2013; Maynard et al. 2018; Melvin and Gordon 2019), conditions which are commonly measured following treatment for SR (Heyne, Strömbeck, Alanko, Bergström, and Ulriksen, accepted). In the current study, autistic youth who displayed emerging SR reported higher anxiety and depression than those not displaying emerging SR, underscoring the relevance of anxiety- and depression-related interventions with autistic youth displaying SR. At the same time, adaptations to CBT interventions for youth anxiety and depression need to be considered when employed with autistic youth (e.g., Lyneham et al. 2016). SR treatment includes interventions to help parents manage home-based factors maintaining SR, such as youth sleeping in on school mornings (e.g., Heyne and Rollings 2002; Heyne and Sauter 2013). Item-level analysis in the current study indicated the potential role of sleeping problems in emerging SR among autistic youth (i.e., sleeping difficulties; big change in sleeping habits), pointing to the value of helping parents and youth establish evening and morning routines conducive to youth waking on time for school. The important role of parents is observed in Kurita's (1991) study of SR among youth with autism or another pervasive developmental disorder. Kurita argued that "parental tenacity to have the child attend school" helped ward off "full-blown school refusal" among many of the autistic youth who displayed hesitancy about attending school (p.

13). At the same time, the fact that autistic youths' sleep may be disturbed as a result of bullying highlights the importance of effective school-based interventions to prevent and reduce bullying, discussed next.

Numerous interventions have been recommended for the prevention of school attendance problems (e.g., Kearney and Graczyk 2014) but there is minimal discussion about the prevention of SR specifically. The current study is one of few empirical studies to find a link between bullying and SR, distinguishing it from studies including only anecdotal reports of a link. It thus emphasizes the importance of school-wide preventive interventions at Tier 1 of the Response to Intervention model (Kearney 2016; Kearney and Graczyk 2014), particularly interventions that reduce bullying and improve school safety. As suggested by Kurita (1991), teachers' efforts to protect youth from teasing and to avoid harsh discipline could make school attendance easier among autistic youth who might otherwise refuse to attend. School professionals need to be aware that autistic youth are especially vulnerable to bullying, particularly in mainstream school settings, and to implement multi-level interventions focused on students, school professionals, and school climate (Humphrey and Hebron 2015). Autistic youth have the right to attend school without being bullied and perhaps traumatized by bullying. For as long as a mainstream educational setting continues to be an unsafe environment due to bullying, alternative settings that support autistic youths' social-emotional and educational development can be considered (for examples, see Brouwer-Borghuis et al. 2019).

As in all research, there are limitations on the generalizability of these findings. First, the sample was adequate (according to a priori power analysis), but increased size would bring more statistical power and provide further illumination of associations between the variables studied. Second, limitations of sex, nationality, culture, and 'volunteerism' (i.e., not all parents who received the invitation to participate did so, and no data were collected on non-participants) mean that caution must be used when suggesting that these findings are applicable to other samples of autistic boys or to autistic girls. In particular, the mention of "bullying" in the recruitment materials may have yielded a sample biased towards reporting on bullying, but we are less concerned about this potential bias because the aim of this study was not to investigate the prevalence of bullying *per se*. However, because there were no fathers who responded to the recruitment materials, the issue of how fathers would respond to the questionnaires remains unexplored. Third, the sample was 'mildly impaired' (i.e., attended mainstream schools and had $IQ > 70$). It is possible that similar research with mildly impaired autistic girls, or boys and girls with greater impairment, would yield different results. Although a decision was made to recruit autistic boys because of the greater prevalence of autism among boys (based on

current assessment methodologies), and the overall aim of this research programme into autistic boys, the collection of similar data from a sample of autistic girls would enable direct comparisons across sex. Fourth, when faced with disagreement between mothers' and sons' reports of bullying (nine of the 57 mother-son pairs disagreed with each other on this point), we made a decision to accept the boys' reports on whether they had been bullied or not because we reasoned that some boys may not have told their mothers this information. Fifth, we also decided to restrict our focus to the boys' information because that was a self-report of an event (i.e., being bullied) that they would have experienced in personal terms, rather than second-hand as the mothers' reports would have been. Essentially, although the collection of mothers' understanding of whether their sons experienced bullying or not are of interest, it was not the focus of this study. The decision to focus on GAD and MDD was based upon previous literature indicating that these were the most prevalent forms of anxiety and depression in autistic male youth (Bitsika and Sharpley 2015a, b). However, future research should include Social Phobia and Separation Anxiety, which are also prevalent among this population. Another limitation is the lack of information about the frequency of youths' requests over time to stay home from school, and whether these requests actually led to absence from school. To be sure, the parent's report of their child's request to stay at home because of bullying reflects a defining feature of SR, i.e., reluctance to attend school (Heyne et al. 2019). At best, the study addresses emerging SR as opposed to established SR (Ingul et al. 2019), unlike Kurita's (1991) study in which many youth had been absent from school due to SR for an extended period of time (i.e., one to six months). Perhaps the greatest limitation of this study, and the obvious next step to be taken in this kind of research, is that it was cross-sectional and did not allow for any kind of temporal 'causality' to be deduced.

The current study has several noteworthy strengths. First, by linking mothers' responses with those from their sons to confirm that the boys were indeed autistic, we likely increased the validity of data relative to when online data are collected with no check that the respondents are genuinely autistic. Second, the CASI-4 GAD and MDD scales have sound psychometric properties and have been widely used in research with autistic youth. Third, the questions about bullying had been developed from face-to-face interviews with a sample of 10 autistic boys, and therefore were less likely to be misunderstood by autistic youth in the current sample.

Notwithstanding this study's limitations, and based upon its strengths, several conclusions may be drawn. First, the high prevalence of bullying among autistic youth remains an issue of concern. Second, the association between being bullied and the desire to avoid school calls for urgent development of effective methods to prevent and reduce bullying

and assist autistic youth to cope with bullying if it occurs. There is no *prima facie* reason why autistic youth cannot succeed at higher education, but the pathway to higher education, and thus to the financial and career success that follow, is usually satisfactory completion of secondary education. There is a risk that autistic youth who refuse to attend school will not be able to travel that path because they do not complete secondary education. Third, there are benefits for individuals and the community when non-autistic students are able to interact with autistic peers, but this double-value outcome will occur less often if there are many autistic youth who do not attend school.

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Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethics Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study was approved by the Human Research Ethics Committee of Bond University.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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