GENDER DIFFERENCES IN REPETITIVE BEHAVIOURS IN CHILDREN DIAGNOSED WITH AUTISM SPECTRUM DISORDER

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Abstract: *Repetitive behaviours are one of the main criteria contributing to a diagnosis of autism spectrum disorder (ASD), along with deficits in social communication and interaction. They refer to predictable actions that the child displays repeatedly and/or performs similarly or identically. These actions include a wide range of behaviours such as motor stereotypies, preoccupation with parts of objects, insistence on sameness, limited interests, ritualised behaviours, and sensory hypo- and hyper-reactivity. The prevalence of ASD is steadily increasing, and it is a disorder that has been diagnosed more frequently in boys than girls since its inception. Numerous studies have reported contradictory findings regarding gender differences in the quantity and quality of repetitive behaviours. Therefore, the aim of this study was to investigate whether there are gender differences in repetitive behaviours in children with ASD between the ages of 6 and 9 years, as well as to describe these differences. The participants included 50 parents of children with autism spectrum disorder (30 boys and 20 girls), who were between 6 and 9 years old and had (above) average intellectual abilities. All participants completed the Revised Scale of Repetitive Behaviours and the data obtained were statistically analysed using non-parametric methods. The results indicate that girls exhibit more self-injurious behaviours and less restricted behaviours than boys. No statistically significant gender differences were found for the other subscales of the questionnaire, suggesting that other behaviours occur equally in boys and girls. Overall, repetitive behaviours can be considered as an equally moderate problem for both parents of boys and girls.*

Keywords**:** *autism, repetitive behaviours, gender differences*

INTRODUCTION

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterised by difficulties and differences in social communication and interaction (such as establishing and maintaining relationships, using verbal and non-verbal communication for social purposes), as well as repetitive behaviours such as stereotypical use of speech, language, and the use of objects, stereotypical movements, insistence on sameness, specific and intense interests, and excessive or reduced sensitivity to sensory stimuli (American Psychological Association, 2023). These characteristics do not occur to the same extent in all individuals diagnosed with autism spectrum disorder (hereinafter referred to as individuals with ASD): there is significant variability in their manifestation, ranging from mild, sometimes barely noticeable differences to difficulties that significantly affect an individual's life and require a high level of support (Allely, 2019). Therefore, diagnosing ASD often presents a significant challenge.

Challenges in diagnosing individuals with autism

Since the formulation of the diagnostic criteria for ASD, research has shown a significantly higher prevalence of autism diagnoses in boys than girls, indicating that ASD has been described based on observations of behaviours mainly in boys, which are not necessarily equivalent to behaviours observed in girls. This poses a problem in the diagnosis of this disorder, which continues to be determined exclusively based on be-

havioural characteristics described in diagnostic manuals (Cepanec et al., 2015). The prevalence of ASD has been steadily increasing since the 1970s, with a recent estimate stating that 1 in 36 (2.7%) children are diagnosed with ASD (Maenner et al., 2023). According to The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V) (American Psychological Association, 2013), ASD is diagnosed four times more often in boys than in girls. When intellectual abilities are considered as part of clinical samples, girls and women are more likely to exhibit additional intellectual developmental disorders, indicating that those with average or above-average intellectual abilities who could potentially have ASD may be unrecognised (American Psychological Association, 2013). The high ratio of boys to girls diagnosed with ASD may reflect aspects of the aetiology of ASD, but there is a likely bias in the perception, assessment, and/or diagnosis of ASD in girls. Girls are typically diagnosed with ASD later than boys (Kirkovski et al., 2013) and are often misdiagnosed (Van Wijngaarden-Cremers et al., 2014), indicating numerous obstacles and challenges in the diagnostic process for girls. The first obstacle in diagnosing girls arises even before the assessment and diagnostic process begins. Research has shown that they are referred for diagnosis ten times less often than boys (Wilkinson, 2008), and parents express significantly less concern for their daughters showing autism-like characteristics than for their sons. Certain behaviours are exhibited differently in boys and girls; for example, hypersensitivity and isolation are more tolerated in girls and are attributed to character traits (Tofani et al., 2023). Therefore, girls must have more pronounced difficulties or accompanying intellectual difficulties to be referred for further assessment (Lockwood Estrin et al., 2021).

When girls undergo assessment for ASD, there is a high probability that they will not meet the criteria for a diagnosis. This is because the diagnostic standards for ASD were primarily developed and tested on male samples and do not consider gender differences (Lai et al., 2011). Furthermore, examples provided in diagnostic manuals for each criterion are based on the male phenotype, which may cause uncertainty in the diagnosis provided by inexperienced diagnosticians (Frazier et al., 2014). However, due to many different and inconsistent results, significant research limitations, and small samples of girls and women, little is known with certainty about the female phenotype of ASD, making it difficult to identify the characteristics associated with it (Knutsen et al., 2019). Hiller et al. (2014) suggested that girls diagnosed with ASD are better at sharing their interests, more likely to engage in reciprocal conversations, and more likely to use non-verbal communication. They also talk more frequently about their friends and have a higher level of social motivation, i.e., a greater desire to create and maintain friendships (Libster et al., 2023). However, what appears to complicate the diagnosis of girls, according to Hiller et al. (2014), is the individual's ability to control their behaviour in different social situations by using conscious or unconscious strategies to minimise ASD characteristics in social environments, also known as social masking. Strategies include, for example, mimicking the facial expressions of a communication partner and concealing repetitive behaviours, and so on. Masking is observed more frequently in girls than boys and it is considered as the main characteristic of the female ASD phenotype (Hull et al., 2020). By masking symptoms, girls may appear socially and emotionally more competent than they actually are. Therefore, it is important to consider this characteristic in the diagnostic process (Hull et al., 2020).

Repetitive behaviours

Repetitive behaviours play a significant role in ASD diagnosis since they are considered to be one of the basic characteristics of ASD clinical phenotypes. Repetitive behaviours refer to a wide range of behaviours that include motor stereotypies, preoccupation with parts of objects, insistence on sameness, specific, intense interests, ritualised behaviours, sensory hyper- and hypo-reactivity, and unusual sensory interests (Song et al., 2022). These behaviours are not exclusively related to ASD, and they are also observed in typically developing children and children with intellectual

disabilities. However, in children with ASD, these behaviours are more frequent, pronounced, persist throughout development, and can interfere with learning, social development, and adaptive skills (Leekam et al., 2011). In recent years, there has been an increasing number of studies addressing repetitive behaviours in ASD.

Significant attention has also been paid to gender differences due to the experiences of clinicians and individuals diagnosed with ASD, who report that these behaviours are less common and less noticeable in girls. Many researchers speculate that the much higher prevalence of boys diagnosed with ASD may be because they exhibit more repetitive behaviours than girls (Allely, 2019). However, as with research on gender differences in the domain of communication and social interaction, there are conflicting results in the domain of repetitive behaviours as well. Some studies have shown that girls have fewer repetitive behaviours (e.g., Van Wijngaarden-Cremers et al., 2014), while others have found no differences between genders (e.g., Siracusano et al., 2021). Those studies that have found gender differences in repetitive behaviours emphasise that they differ not only in quantity, but also in the types of repetitive behaviours observed. Girls have fewer narrowed interests (Frazier et al., 2014), lower levels of interest in lining up and arranging objects (Hiller et al., 2014), and fewer repetitive sensory-motor behaviours than boys (Van Wijngaarden-Cremers et al., 2014).

Additionally, boys and girls exhibit different interests. Younger boys are preoccupied with toys with wheels, older boys with video games and television, and girls with animals, books, and so on. The interests of girls are less associated with ASD because they are socially acceptable and do not affect daily life as much, and hence, parents tend to report them less frequently (Hiller et al., 2014). On the other hand, girls exhibit more self-injurious and compulsive behaviours than boys, possibly due to mental health issues such as anxiety, obsessive-compulsive disorder, and other psychiatric disorders (Antezana et al., 2019). Furthermore, repetitive behaviours in girls tend to become more pronounced at an older age. Parents report them less frequently at younger ages since they are not as obvious and clear as those observed in boys. This is particularly challenging when assessing interests that are inconsistent with what we consider as atypical in girls compared to boys (Siracusano et al., 2021). Clinicians also find it more difficult to qualify these behaviours as atypical and report them less frequently in girls (Allely, 2019). A detailed description of repetitive behaviours in girls, the development of more sensitive measures, and taking gender differences into account may lead to better diagnosis and identification of girls with autism spectrum disorder.

Given the significant gender differences in the prevalence of ASD diagnosis between boys and girls, as well as the considerable inconsistency of results reported in previous research, the present study aimed to determine whether there are gender differences in repetitive behaviours in children with ASD diagnosis, as well as to describe these differences. The description of assumed gender differences in repetitive behaviours can facilitate the identification and diagnosis of girls with ASD and enable the provision of necessary support.

Given the existence of heterogeneity of repetitive behaviours exhibited by boys and girls with ASD, the current investigation focused on the following:

1. To determine which subtypes of repetitive behaviours occur more frequently in girls compared to boys diagnosed with ASD, and vice versa.

2. To determine if there are differences in the extent to which repetitive behaviours observed in boys and girls with ASD pose a challenge to their parents' everyday functioning.

Based on research that has addressed repetitive behaviours in boys and girls diagnosed with ASD and has identified gender differences (e.g., Van Wijngaarden-Cremers et al., 2014, and Antezana et al., 2019), it is expected that girls will exhibit higher proportions of self-injurious and compulsive behaviours, and lower proportions of other repetitive behaviours compared to boys. Additionally, following the findings of Hiller et al. (2014), it is expected that repetitive behaviours

are less likely to be considered as an overall problem by parents of girls with ASD than those of boys with ASD.

METHOD

Participants

The study included parents of children diagnosed with ASD who were between the ages of 6 to 9 years and showed no intellectual developmental disorders. A total of 50 parents completed the questionnaire, forming a non-probabilistic, purposive sample due to the targeted group of the study. In the sample of children whose parents completed the questionnaire, there were 30 boys (60%) and 20 girls (40%) with an average chronological age of 7.02 years (SD = 0.935, Min = 6.00, Max = 9.08).

Measures

Data was collected by administering the Repetitive Behaviour Scale- Revised (Bodfish et al., 2000) translated into Croatian language. It is one of the more comprehensive clinical measures of repetitive behaviours, reporting on the presence and severity of various behaviours, and it is one of the most commonly used scales for measuring repetitive behaviours. Parents fill out the scale based on interactions and observations of their child over the past month. The scale contains 43 items and it is divided into 6 subscales: stereotyped behaviour, self-injurious behaviour, compulsive behaviour, routine behaviour, sameness behaviour, and restricted behaviour. The advantage of the scale is that it overlaps in the types of repetitive behaviours that occur in the diagnostic criteria for ASD, as well as includes self-injurious and compulsive behaviours that are not specific to ASD, but provide additional information on the functioning of individuals with ASD. Items are rated on a Likert-type scale from 0 to 3, where 0 indicates that the specified repetitive behaviour does not occur and 3 indicates that it occurs and represents a serious problem. After each subscale, three questions are posed regarding the frequency of repetitive behaviours, the child's distress if the behaviours are interrupted, and the interference of these behaviours in daily situations. At the very end of the scale, there is a final question asking parents to assess how much of a problem all the listed behaviours in the scale are for both the child and individuals in his/her environment. For this question, parents respond on a numerical scale from 0 to 100, where 0 indicates that the behaviours are not a problem at all and 100 indicates that the behaviours are a serious problem. The reliability of the scale as expressed by the Cronbach's alpha coefficient in our sample is satisfactory ($\alpha = 0.78$).

Data collection and analysis

The data was collected through an online questionnaire created using Google Forms. It was sent to the email addresses of experts throughout the Republic of Croatia and was distributed in associations whose members are parents of children diagnosed with ASD. Before completing the questionnaire, parents were briefed on the purpose and aim of the research study, emphasising that participation was entirely voluntary and anonymous, and that the data obtained would be used solely for research purposes, analysed only at the group level, and would not be misused in any way. All collected data were entered and analysed using SPSS (SPSS 28, IBM). The overall score on each subscale was expressed as the average response from individual items. Descriptive statistical methods were applied to each of the subscales, as well as the final question. The non-parametric Mann-Whitney U-test was used to determine statistically significant differences between genders on each subscale and the final question. For subscales where statistically significant differences between genders were observed, an analysis of each individual question was conducted. The obtained results are presented in tables.

RESULTS AND DISCUSSION

Stereotyped behaviour

The stereotyped behaviour subscale consists of 6 items that encompass seemingly purposeless

movements and actions that the child repeats in a similar manner. The subscale includes behaviours such as body movements, head movements, hand and finger movements, motor gestures, the use of objects by spinning or throwing them, and some unusual sensory features such as covering eyes or ears, sniffing objects, and so on.

These behaviours were reported only by certain participants: 1 parent of a girl and 5 parents of boys reported that these behaviours do not occur at all in their children. From the results, we can observe that repetitive sensory-motor behaviours are not a serious problem for parents and the child, and these behaviours are not so common. Descriptive statistics of the subscale of repetitive sensory-motor behaviours for boys and girls are shown in Table 1. The range of results in boys is greater than in girls, indicating that these behaviours could be more heterogeneous among boys.

Table 1. *Descriptive statistics for the Stereotyped behaviour subscale – boys and girls*

Subscale	N	C	Q	MIN	MAX
Stereotyped behaviour – boys	30	0.667	0.396	0	2.83
Stereotyped behaviour – girls	20	0.833	0.375	0	1.5

Statistical analysis (Mann-Whitney U-test) did not reveal any gender differences in the overall score of repetitive sensory-motor behaviours. Although boys had a slightly higher mean score on this subscale, the differences were not statistically significant ($p > 0.05$). Based on these results, we can conclude that boys and girls have a similar number of repetitive sensory-motor behaviours and these behaviours have a minor impact on their daily lives. These results are consistent with the findings of Siracusano et al. (2021) and Jasim and Perry (2023), who did not find differences on this subscale or in the overall score of stereotyped behaviours between boys and girls.

A more detailed analysis of individual items revealed a statistically significant difference (Mann Whitney U-test) in the item "use of objects," which involves spinning or turning objects, hitting or throwing them, and dropping objects ($p < 0.05$). Boys achieved higher scores on this item (Mean rank - boys = 26.14, Mean rank - girls = 17.82). This is consistent with the findings of Antezana et al. (2019), who associated this behaviour with restricted interests in boys, specifically their preoccupation with spinning objects. This particular interest has been shown to be more common in boys than in girls (Lai et al., 2015), which may explain the gender differences observed in this item.

Self-injurious behaviour

Self-injurious behaviours are movements or actions that can cause redness, bruises, or other bodily injuries, and these behaviours are repeated by the child in a similar manner. They include hitting with body parts, hitting surfaces or objects, hitting oneself with objects, biting, pulling, scratching, pinching, and putting a finger or object into the eye. These behaviours have also been observed in children with certain mental health conditions, and their occurrence can be associated with mental health problems in individuals diagnosed with ASD (Jasim & Perry, 2023).

In the preset study, parents reported that self-injurious behaviours are the rarest of all subtypes of repetitive behaviours in both boys and girls (see Table 2). 14 parents of boys reported that their children have not exhibited any of these behaviours. A slightly smaller number of parents of girls (N = 6) also stated that these behaviours do not occur at all.

Table 2. *Descriptive statistics for the self-injurious behaviours subscale – boys and girls*

Subscale	N	C	Q	MIN	MAX
Self-injurious behaviours – boys	30	0.125	0.125	0	3
Self-injurious behaviours – girls	20	0.375	0.5	0	1.38

Statistically significant differences (Mann-Whitney U-test) were found in the overall score of the self-injurious behaviours subscale between boys and girls with ASD ($p < 0.05$). Although the frequency of occurrence of these behaviours was very low, girls achieved higher scores on this subscale than boys (see Table 3). These results indicate that both girls and boys exhibit few of these behaviours, but self-injurious behaviours

are more common in girls, posing a greater concern for their parents and other individuals in their environment. Similar results have been obtained in several other studies (e.g., Frazier et al., 2014; Antezana et al., 2019; Tofani et al., 2023).

Table 3. *Gender differences on the self-injurious behaviours subscale*

Subscale	Girls (N = 20)	Boys (N = 30)	Mann-Whitney U-test
Self-injurious behaviour	Mean rank	Mean rank	P
	28.32	19.77	0.028

The items that best differentiate boys and girls on this subscale are hitting oneself with objects, biting, and pulling hair (see Table 4).

Table 4. *Gender differences on specific items on the self-injurious behaviours subscale*

Item	Girls (N = 20)	Boys (N = 30)	Mann-Whitney U-test
	Mean rank	Mean rank	P
Hits self with body part	25.03	21.77	0.283
Hits self against surface or object	25.71	21.36	0.174
Hits self with object	27.24	20.43	0.030
Bites self	26.74	20.73	0.063
Pulls	28.12	19.89	0.011
Rubs or scratches self	25.44	21.52	0.145
Skin picking	25.38	21.55	0.235
Inserts finger or object	23.59	22.64	0.635

Hair pulling has been identified as the most common and problematic repetitive self-injurious behaviour in girls. Additionally, the item "pulling hair" was identified as the most distinguishing item related to gender in the study conducted by Antezana et al. (2019). Apart from viewing hair pulling as a form of self-injurious behaviour, it can also be seen as a form of self-stimulation, which is often observed in children diagnosed with ASD. It can help them regulate and control incoming sensory stimuli and make them feel more comfortable in their environment (Steenfeldt-Kristensen et al., 2020).

Repetitive self-injurious behaviours largely depend on the individual's mental state, and gender differences on this subscale can be explained by the higher frequencies of occurrence of psychological disorders such as anxiety and depression in girls diagnosed with ASD than in boys with ASD (Antezana et al., 2019). Therefore, it should be noted that these behaviours may not necessarily reflect the female phenotype of ASD, but may rather be part of these associated difficulties. Nevertheless, it is important to emphasise that these behaviours occur more frequently in girls with ASD and can significantly impact their daily lives and safety, thus requiring consideration when providing adequate support. The high rate of these behaviours in girls with ASD may also complicate their accurate diagnosis, possibly leading to frequent misdiagnoses, where girls are initially diagnosed with a psychiatric disorder rather than ASD (Van Wijngaarden-Cremers et al., 2014).

Compulsive behaviour

Compulsive behaviours are actions and behaviours that a child repeats and performs according to specific rules, i.e., they must be carried out in a precise manner. These behaviours include the need for completion (e.g., insisting that all doors are closed/opened), excessive washing and cleaning, repeated checking (e.g., doors, windows, locks), counting items or objects, hoarding and collecting certain items, the need for repeating actions (e.g., repeatedly entering/exiting through a door), and the need for touching or tapping objects and people.

Similar to sensory-motor behaviours, compulsive behaviours were not observed by all participants – 5 parents of boys and 2 parents of girls marked a response of 0 (behaviour does not occur) on all items of this subscale. The median score for this subscale was the same for girls and boys, but the range of responses, similar to all other subscales, was wider in boys (see Table 5).

Table 5. *Descriptive statistics for the compulsive behaviour subscale – boys and girls*

Subscale	N	C	Q	MIN	MAX
Compulsive behaviour – boys	30	0.625	0.422	0	3
Compulsive behaviour – girls	20	0.625	0.563	0	1.38

Although the study by Antezana et al. (2019) showed that girls exhibit more compulsive behaviours than boys, in the present study, the differences were not statistically significant ($p > 0.05$). A more detailed analysis revealed that there were no gender-related differences on any of the items in this subscale, indicating that girls and boys exhibit a similar number of these behaviours, and these behaviours do not pose a serious problem for their parents and other individuals in their environment.

Routine behaviour

The routine behaviours subscale pertains to performing everyday activities in a similar manner. It includes persevering in routines during feeding, sleeping/bedtime, dressing and self-care, traveling, playing, and social interactions. Compared to other behaviours, this type of repetitive behaviour was the most commonly observed behaviour in both boys and girls, thus, posing the greatest challenge for parents who participated in the present study. Only 2 parents of boys reported that these behaviours do not occur at all in their child (see Table 6). It should be noted that although routine behaviours were the most common in this study, according to the medians (C), we can see that they do not represent such a serious problem for parents overall and are not as common in everyday life. Furthermore, all the girls exhibited routine behaviours, but to a slightly lesser extent than the frequency of occurrence among the boys.

Table 6. *Descriptive statistics for the routine behaviour subscale*

Subscale	N	C	Q	MIN	MAX
Routine behaviour – boys	30	1.083	0.646	0	3
Routine behaviour – girls	20	1	0.375	0.17	2.5

There were no statistically significant differences found in the overall score of the routine behaviour subscale between boys and girls ($p > 0.05$). Routine behaviours occur equally in boys and girls and they pose an equal challenge for parents and the environment. These results are consistent with the findings of the study conducted by Jasim and Perry (2023), who did not find gender differences in routine behaviours. Responses on the routine behaviour subscale are somewhat higher than on the other subscales, indicating that these behaviours have a greater impact on daily life and pose several challenges for the child, the parents, and the environment.

A statistically significant difference was observed between boys and girls on the item "sleeping/going to bed" ($p < 0.05$). Boys achieved higher scores on this item than girls (Mean rank - boys = 25.93, Mean rank - girls = 18.18), indicating that boys are more likely to adhere to certain routines before going to bed, insist on having certain items with them during sleep, and insist on the presence of a specific person before and during sleep. These behaviours represent a more serious challenge for parents of boys than for parents of girls. Such routine behaviours provide a sense of safety for children with ASD and facilitate the time before sleep and sleep itself.

Sameness behaviour

Sameness behaviour involves resistance to change and insistence on things remaining as they are. A child exhibiting sameness behaviours may insist on keeping objects in the same place, resist visiting new places, become upset if interrupted in their activities, insist on walking in a specific pattern, always sit in the same spot, dislike changes in the appearance and/or behaviour of people around them, insist on using specific doors, listen to the same music or watch the same movie repeatedly, have difficulty transitioning from one activity to another, adhere to the same routine at daycare and at home, and insist on certain events happening at exact times. Individuals diagnosed with ASD may exhibit a preference for routine and consistency as a coping mechanism in stressful or anxiety-inducing circumstances. This means that maintaining a predictable level of structure in their environment can help alleviate their anxiety (Green et al., 2006).

From the descriptive statistics, we can conclude that these behaviours are not very common among the children included in this study and do

not pose a serious problem for parents and other individuals in the environment. Similar to other subscales, parents of girls had a narrower range of responses on the sameness behaviour subscale. The behaviour that does not appear at all in girls is insistence on using specific doors; this was reported by in 7 of the boys. Descriptive statistics of the sameness behaviour subscale for boys and girls are listed in Table 7.

Table 7. *Descriptive statistics for the sameness behaviour subscale – boys and girls*

Subscale	N	C	Q	MIN	MAX
Sameness behaviour – boys	30	0.818	0.534	0	3
Sameness behaviour – girls	20	0.636	0.227	0	1.27

There were no gender differences found in the overall score of the sameness behaviour subscale ($p > 0.05$). Boys and girls exhibit the same levels of these behaviours overall, and on average, these behaviours do not pose a problem for their parents and the environment.

However, a more detailed analysis revealed gender differences on 2 items of the sameness behaviour subscale ($p < 0.05$; see Table 8). Boys are more insistent on walking in a specific pattern and this behaviour poses a greater problem than it does for girls. Additionally, boys exhibit insistence on using specific doors, a behaviour that was not exhibited by any of the girls in the present study. These results indicate that boys may insist more on sameness in certain situations compared to girls.

Table 8. *Gender differences on specific items of the sameness behaviour subscale*

Item	Girls (N = 20)	Boys (N = 30)	Mann-Whitney U-test
	Mean rank	Mean rank	p
Insists on walking in a particular pattern	18.68	25.63	0.022
Insists on using a particular door	20.00	24.82	0.043

Restricted behaviour

Restricted behaviours involve a narrowed range of interests and activities, wherein a child becomes fascinated or engrossed in a single object or activity, becomes highly attached to a specific object, becomes absorbed in parts of an object rather than the whole object, or becomes fixated on objects that move.

A small percentage of parents indicated that none of these behaviours occur at all in their children – 5 parents of boys and 2 parents of girls. Girls, once again, showed a narrower range of responses, and the responses suggest that when restricted behaviours do occur, they pose a mild problem for parents of girls. Descriptive statistics of the restricted behaviour subscale for girls and boys are presented in Table 9.

Table 9. *Descriptive statistics for the restricted behaviour subscale – boys and girls*

Subscale	N	C	Q	MIN	MAX
Restricted behaviour – boys	30	0.875	0.5	0	3
Restricted behaviour – girls	20	0.5	0.25	0	1

There are statistically significant differences in the overall score on the restricted behaviour subscale between boys and girls with ASD ($p < 0.05$). Although the occurrence of restricted behaviours is low, they are more common in boys. Compared to the girls, these behaviours pose a more serious problem for the parents of boys, as well as individuals in their environment (see Table 10). These results are consistent with numerous studies indicating that the interests of girls are broader and less restricted, as well as more socially acceptable, suggesting that they pose a smaller problem for the child, parents, and other individuals in their environment overall (e.g., Hiller et al., 2014; Van Wijngaarden-Cremers et al., 2014).

Table 10. *Gender differences on the restricted behaviour subscale*

Subscale	Girls (N = 20)	Boys (N = 30)	Mann-Whitney U-test
Restricted behaviour	Mean rank	Mean rank	p
	17.12	26.57	0.018

Boys exhibit restricted behaviours at higher frequencies and severity on all items of the subscale compared to girls (see Table 11). The study by Lai et al. (2015) identified objects that move as a common interest among boys diagnosed with ASD.

Table 11. Gender differences on specific items of the restricted behaviour subscale

Item	Girls (N = 20)	Boys (N = 30)	Mann-Whitney U-test
	Mean rank	Mean rank	p
Fascination, preoccupation with one subject or activity	18.62	25.66	0.049
Strongly attached to one specific object	18.50	25.73	0.05
Preoccupation with part(s) of object rather than the whole object	18.18	25.93	0.013
Fascination, preoccupation with movement/things that move	18.62	25.66	0.021

The presence of fewer restricted interests, which are one of the main characteristics of ASD, can significantly contribute to the under-recognition and misdiagnosis of ASD in girls. However, it should be considered that girls may not actually exhibit a smaller number of restricted interests, but these interests may simply differ from those commonly observed in boys diagnosed with ASD. Consequently, parents and professionals may find it harder to recognise them as atypical and may report them less frequently. Boys are more likely to have interests related to television, video games, spinning objects, numbers, and letters – objects that are more commonly associated with ASD interests. On the other hand, girls may have interests related to animals, books, seashells, and so on – objects less commonly associated with ASD (Hiller et al., 2014). As a result, the interests of girls are less likely to be interpreted as ASD-related, particularly among younger girls. Additionally, these interests may be less intense and have minimal impact on daily life, leading to less concern among parents, as shown by the results of the present study.

Moreover, examples of unusual interests in questionnaires and diagnostic criteria are often based on interests exhibited by boys with ASD (Antezana et al., 2019), which may explain why more parents of boys reported that their children have unusual interests. Furthermore, girls are more likely to camouflage autism characteristics, including imitating the interests of popular girls in their environment to fit in. This further complicates their recognition, potentially leading to oversight by parents and inexperienced clinicians (Lai et al., 2011).

In conclusion, some of the gender differences in the frequency of restricted interests may be explained by biological differences. However, it is essential to consider that some differences may result from a lack of understanding of how restricted interests manifest in girls.

Perception of severity/problem of repetitive behaviours

Regarding the final question, parents were asked to assess how much of a problem the repetitive behaviours posed both to their child and to their environment. This assessment was conducted on a scale from 1 to 100, where 1 indicates that the behaviours are not a problem at all and 100 indicates that they represent a serious problem. Table 12 shows the descriptive statistics for boys, indicating that the repetitive behaviours of boys diagnosed with ASD are, on average, perceived by parents and their environment as a moderate problem. The responses range from 1 to 100, indicating a wide range in the perception of the impact of repetitive behaviours on daily life. Since none of the parents of boys responded that repetitive behaviours do not occur at all, we can infer from this range that some parents do not perceive these behaviours as a problem, but for others, they are a significant problem that significantly affects

daily life. In Table 12, it is evident that the range of responses for girls is slightly smaller. Specifically, no parent marked the response 100, suggesting that repetitive behaviours are not as severe of a problem for them. On average, repetitive behaviours are perceived by parents of girls as a mild to moderate problem.

Table 12. *Descriptive statistics of final question – boys and girls*

Question	N	C	Q	MIN	MAX
How much of a problem are these repetitive behaviours (1-100)? – boys	30	50	25	1	100
How much of a problem are these repetitive behaviours (1-100)? – girls	20	37	17.5	1	80

Further analysis did not yield statistically significant differences in how much of a problem repetitive behaviours pose to parents of boys compared to parents of girls. The results indicate that these behaviours equally impact the daily lives of both boys and girls with ASD of early school age. In both boys and girls, repetitive behaviours moderately disrupt daily life, meaning they do not represent such a serious problem for parents and the environment. It is also important to emphasise the role that insistence on sameness behaviours and restricted interests have in reducing anxiety in individuals diagnosed with autism (Lidstone et al, 2014). These results contradict the findings of Hiller et al. (2014), who reported that repetitive behaviours, especially interests, are more socially acceptable in girls and have less of a negative impact on daily life compared to boys. The reason for the conflicting results may be that, in the present study, girls exhibited significantly more self-injurious behaviours, which can cause higher levels of concern for the safety of their children among parents, and thus a higher overall problem rating on the final question.

CONCLUSION

Given the significant differences in the prevalence of ASD between boys and girls, especially in the context of differences in repetitive behaviours and conflicting results in previous studies, the aim of this research study was to determine if there are gender differences in repetitive behaviours among children with ASD, as well as to describe these differences. The research results showed that girls exhibit more self-injurious behaviours than boys, which represent a more serious problem for their parents and surroundings. Self-injurious behaviours may reflect mental health issues in girls with ASD, further complicating and delaying their accurate diagnosis. Additionally, girls exhibit fewer restricted behaviours, i.e., atypical and unusual interests. These results can be explained by the fact that questionnaires and diagnostic tools are more tailored to boys, with examples based on behaviours exhibited by boys. Therefore, recognising and characterising the interests of girls as atypical is more challenging. There were no statistically significant differences in the extent to which repetitive behaviours pose an overall problem for parents of boys and girls. Overall, repetitive behaviours present a mild to moderate problem for both parents of boys and those of girls. These factors can complicate and delay the diagnosis of girls with ASD, highlighting the need for further research based on a larger and more controlled sample of participants to conclusively determine gender differences and better describe the female phenotype of ASD. The small, deliberate sample in the present study is a limitation that prevents the generalisability of the findings. Additionally, due to the method of data collection (online questionnaire), we cannot be certain that only parents of children meeting all the criteria (ages 6 to 9 years, ASD diagnosis, average or above-average intellectual abilities) completed the questionnaire. As previously stated, many diagnostic instruments and questionnaires, including this one, are based on behaviours that are typically observed in boys. The examples given in the questionnaire to help parents understand and explain certain behaviours are more suited to boys than girls, which may negatively impact the recognition of certain behaviours in girls. Despite these limitations, data on the occurrence of self-injurious behaviours in children with ASD underscore the importance of focusing more attention on the mental health of these children and ensuring timely and quality support.

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