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Girls and women with autism

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Summary

Girls and women with autism are often undiagnosed, misdiagnosed or receive a diagnosis of autism at later age. This can result in adverse outcomes in their well-being, mental health, education, employment, and independence. The diagnosis of autism spectrum condition/disorder (hereinafter referred to as autism), with its current features linked with descriptions in the major diagnostic classification systems, is based primarily on observations and research on males. The term 'Autism Spectrum Condition' (ASC), used in this paper, has been coined by Simon Baron-Cohen and used in the professional literature for a decade to respect these individuals on the autism spectrum who feel that the term 'disorder' is stigmatizing, whereas ASC presents both the strengths of these people and difficulties they experience. The research shows that autism in females has unique symptomatology and manifests itself differently, more subtly, especially in high-functioning girls and women, i.e., those with fluent speech, average or above-average intelligence quotient. The research also shows diagnostic stereotypes and lack of required sensitivity to identify autistic females. Additionally they do not reflect the unique presentation of autism in females demonstrated by greater compensatory capacity and an ability to develop sophisticated methods of 'camouflaging' and masquerading. Furthermore, autism in females is associated with high comorbidity during adolescence including anxiety disorder, tic disorder, depression, high incidence of suicide, eating disorders, and high rates of other medical problems. Timely diagnosis, however, can reduce the difficulties that females with autism experience over their lifetime, allowing for the assessment of their needs regarding health, education, leisure, social relationships, and employment.

Key words: autism, girls, women

Introduction

Autism spectrum condition (ASC)/disorder (ASD), henceforth autism [1, 2], is diagnosed more frequently in males than in females with the sex ratio varying from 4:1 to 2.0–2.6:1 and is influenced by a number of biases [3]. Most clinicians agree that there is a sex effect in the prevalence and symptomatology of autism [4] and that high-functioning females can pretend not to show autism, which is a phenomenon called "camouflaging" [5], and already described in autobiographies published by women with ASC. It is hypothesized that females may require a greater abnormalities at the genetic level in order to develop autism [6], referred to in the literature as the 'female protective effect'. Females with autism hide complex social confusion and sensory struggles [7], which they also report as exhausting and disorienting. Females with autism have a higher rate of comorbid conditions such as anxiety, tic disorder, depression or eating disorders and are often misdiagnosed, diagnosed late in life, or may never come to clinical attention at all [8]. Most diagnostic assessments are based on research with males with autism and are not sensitive enough to clinical presentations of females with autism, allowing females with autism to 'slip through the diagnostic net'. As a result, sex-specific diagnostic assessment tools may need to be considered [9]. Females with autism are prone to abuse and sexual victimization and even those who are high-functioning need substantial support to become healthy and independent adults [10].

The authors use the term 'Autism Spectrum Condition' (ASC), which has been coined by Simon Baron-Cohen to respect these individuals on the autism spectrum who feel that the term 'disorder' is stigmatizing, whereas ASC presents both the strengths and difficulties of these people [1, 2]. ASC is interpreted as a state of being or the condition of health. A mental disorder is a syndrome characterized by clinically significant disturbance in an individual's cognition, emotion regulation, or behavior that reflects a dysfunction in the psychological, biological, or developmental processes underlying mental functioning. Mental disorders are usually associated with significant distress or disability in social or occupational activities [1, 2, 11]. The separation of the majority of mental disorders in the DSM-5 or ICD-10 was made mainly for practical reasons related to medical, social or legal proceedings. The authors of these classifications use the more general term 'disorder' to avoid any doubts in comparison to the term 'disease' or 'illness'. The concept of 'mental illness' has been given a different meaning than disorder in Polish legal system. People suffering from 'mental illness' have greater access to free health services, and it is possible to treat some of these patients without their consent. Furthermore, the disease entity characterizes with specific causes, symptoms and course which have been officially recognized by a team of specialists. Despite the different connotations of these terms, they are often used interchangeably [1, 2].

Females with autism – diagnostic criteria and assessment instruments

The DSM-5 diagnostic criteria [11] present internationally agreed core characteristics of autism. However, the absence of clear autism biomarkers, a very heterogeneous nature of this condition and variances in its phenotypic expression increases an ongoing debate on these criteria and how autism is defined. This debate has been intensified even more by recent research on sex differences in autism.

The assessment of autism is based on observation of social and communication behavioral characteristics alongside with developmental history. These observations are influenced not only by sex but also by presence or absence of the comorbidity like intellectual disability, depression, anxiety, ADHD, epilepsy, tics, etc. [2]. There is a growing evidence suggesting that there are true sex differences in autism [12] and many different factors need to be taken into account when considering the diagnosis of ASC in females [3, 5]. The sex biases include not only how autism is traditionally defined but also the biases in standardized diagnostic instruments and existing research methodology [3, 9]. Many research use not only the variety of diagnostic outcome measures but also have no comparative control groups of both sexes without neurodevelopmental difficulties [4, 13]. These differences in methodology make it hard to compare the studies.

A diagnosis of autism in girls and women is additionally impacted by developmental, psychological, social and cultural influences [14]. More recently the concept of unique phenotype of females with autism has been widely discussed [15, 16]. This unique phenotype is particularly relevant in high-functioning girls and women who are skilled at camouflaging, masquerading and compensating for difficulties which stem from their autism [17]. Girls and women with autism, as opposed to boys and men with autism, have stronger desire to have social relationships, to have friendships, to be amongst their peers. High-functioning females with autism have less impaired behavior in play, have sometimes even superior imaginative abilities and very rich fantasy world in comparison to males with this condition. They are more skilled at observing and imitating typical developing peers and mimicking their behaviors. Girls and women with autism have less stereotyped, restrictive and repetitive behaviors and their particular topics of interest are not traditionally linked with ASC in the cultural, social and developmental context. At the same time the diagnostic criteria are traditionally constructed on a male stereotype and do not take this unique pattern of behaviors of females with autism under consideration. Scottish Intercollegiate Guidelines Network confirms the clinical need for acknowledging that girls and women with autism may present with subtle or qualitative differences in their autism symptoms and level of impairment [18].

Currently available standardized diagnostic instruments such as the *Autism Diagnostic Observation Schedule*, both ADOS and ADOS-2 [19, 20], *Autism Diagnostic Interview-Revised* (ADI-R) [21] and the *Social Communication Questionnaire* (SCQ)

[22] are not sensitive enough to identify traits of autism in females [5, 8, 9, 13, 16]. These diagnostic instruments have been developed based upon research done with predominantly male samples. Moreover, standardization samples for these assessment tools tend to be predominantly male thus questioning the statistical accuracy and validity of these instruments in females with autism [16]. This all adds to under-recognition of autism in girls and women and let the females with this condition 'slip through the diagnostic net'.

Mood and anxiety disorders

Emotional problems common in ASC adolescent girls and women may lead to the development of anxiety disorders and depression [3]. Recurrent depressive disorder (50% of patients) is the most commonly diagnosed disorder in this population of patients, although some authors suggest that the symptoms of bipolar affective disorders are equally frequent or even more common [23]. Hedley and Uljarević [24], in their systemic literature review, observe that the prevalence of suicidal thoughts among ASC individuals ranges from 11 to 66% and suicidal attempt numbers account for 1% to 35%. Some premature deaths in ASC population are caused by suicide of a patient (0.31%), and this percentage is higher than in a general population (0.04%). This risk is significantly higher in individuals with no accompanying mental disability. Anxiety disorders, which include social anxiety disorder, generalized anxiety disorder, panic disorder, agoraphobia and obsessive-compulsive disorder, are similarly common (50% of patients) among autistic children and youth [23].

BD, ADHD and tic disorder in girls and women with autism

According to the DSM-5, autism spectrum disorder (ASD)/autism spectrum condition (ASC) [1, 2], together with attention deficit hyperactivity disorder (ADHD) and tic disorder (TD) belong to a group of neurodevelopmental disorders. This means that they occur in childhood and do not withdraw after 18 years of age, yet some symptoms may disappear or be insufficiently intensified to meet the criterion.

Bipolar disorder (BD) is classified in the group of affective (mood) disorders. The diagnostic difficulty in the case of these disorders in developmental period as such, and in ASC in particular, in girls and later in women results from the following reasons:

1) there is no biomarker to confirm the diagnosis, which concerns autism, ADHD, BD, and tic disorder;
2) there are no girls/women diagnosed with autism or their number is still too small in scientific research studies to compare the results between the two sexes;
3) current criteria and diagnostic tools in autism (ASD/ASC) are to a great extent created on the basis of the male picture of autism, which does not take into

account numerous significant and different features and behaviors characteristic for girls/women with autism;
4) extremely diverse methodology of scientific research studies, which makes it difficult to compare the results and conclusions among particular studies;
5) it is only possible to carry out a retrospective interview from parents/guardians, which is burdened with a recall bias;
6) limited usefulness of reporting symptoms by a small patient is commonly acknowledged;
7) the symptoms of autism, ADHD and BD may overlap;
8) comorbidity of these disorders is commonly acknowledged;
9) ADHD may affect the development of BD and the other way round;
10) symptoms overlapping (ADHD and BD) or a wrong interpretation of ADHD, BD and autism symptoms.

The diagnostics of autism remains a challenge for clinicians, in particular when divided into sexes. It is especially visible in women, which results in the observed 4.5-times higher prevalence of autism in men [25]. However, this prevalence is frequently questioned by many scientists who focus on the subject of intersexual differences in autism and at present it is quoted at the lower level of 2.0–2.6:1 [3, 9]. One of the reasons of the diagnostic challenges is comorbidity of other disorders and diseases in the course of autism [2, 16]. This often leads to the exclusion of certain features characteristic for the autism spectrum disorder or to a change in a prior diagnosis of autism. The second phenomenon applies to about 10% of patients who received their diagnosis before the age of 8, regardless of sex. A population-based study conducted by Lundström et al. in 2015, covering the parents of all twins born between 1992 and 2001 (n = 19,130), showed that autism with no co-existing disorders was found in less than 5% of cases [26]. Studies conducted by Stadnick et al. [27] in 2017 found that a significant percentage of children diagnosed with ASD also met the criteria for ADHD or anxiety disorder. The literature also provides data confirming the frequent co-existence of BD and ASD [25, 27, 28]. In his review paper, Frias et al. [29] found the frequency of comorbidity of ASD and BD to be between 11 and 30% of studied children. They also found a link between the co-existence of BD and anxiety disorders (around 54%) and ADHD (around 48%). Put in the context of their co-existence with autism, this may suggest the existence of common pathogenetic factors for the above listed disorders.

In a study conducted by Borue et al. [28] around 8% of children diagnosed with BD also met the criteria for ASD diagnosis; moreover, they also found in this group an increased risk for co-existence of ADHD and the obsessive-compulsive disorder (OCD). Such significant differences in the frequency of ASD and BD comorbidity may result from the different clinical pictures of bipolar disorder in this group of patients. Boure et al. [28] notes that in children suffering from autism, BD symptoms have an

earlier onset and are often characterized by mixed episodes and additional impairment in functioning. The clinical picture may also show increased dispersibility of attention, racing thoughts, depressed mood, social withdrawal, and lower mood reactivity than in children diagnosed with BD exclusively.

Despite increased interest in studies on autism, especially among adolescent girls and women, studies on the co-existence of autism and BD are very limited. Most studies cover mixed groups with no sex-specific analysis. A rare exception is a study by Wu et al. [25], which covered 7,077 boys and 1,487 girls and was conducted – among others – to assess the frequency of comorbidity of different psychiatric disorders in autism. Among girls, the increased risk of comorbidity was found only for ADHD (OR = 2.14; 1.42–3.21) and not for BD.

A study by Baron-Cohen et al. [30] covered 447 pupils (mean age: 11 years, girls-boys ratio: 1:5), out of which 280 were diagnosed (based on ICD-10) with 'autism', 141 with 'autism spectrum disorder' and 26 with 'Asperger syndrome'. They found the Tourette Syndrome (TS) to be present in 6.5% of population, which was found to be higher than the contemporary risk for the general population. Moreover, they found 24.4% of studied children (109 children) to show vocal and motor tics of varying degree, despite not having met the diagnostic criteria for TS. According to the authors, with the fluctuating nature of tics in the course of TS in mind, this may mean that the prevalence of 6.5% is underestimated. Baron-Cohen et al. found a total of 34% of children to present different types of tics, which may suggest that children diagnosed with autism experience tics more often than the general population but they are disregarded in the diagnostic process in the context of autistic symptoms [30].

The studies before 2000 covering the Swedish population found a clear link between Asperger Syndrome (AS) and TS [31]. Tourette syndrome diagnosis was established for 20% of children with Asperger syndrome, and almost 80% of children were found to experience chronic motor or vocal tics of varying degree. Other studies found that around 10% of children diagnosed with Tourette syndrome also met the diagnostic criteria for AS, which was also confirmed in a literature review paper by Gillberg and Billstedt [31] where the comorbidity of AS and TS was assessed to be 8%.

Canitano and Vivanti [32] also studied this issue in a group of 105 children diagnosed with autism spectrum disorder. The studied group consisted of 94 boys and 11 girls, mean age of 12 years (SD±3.9 years). The methodology of this study concentrated on the differentiation between tics and stereotypies, which resulted in increased specificity of the results when compared with earlier studies. The presence of tics was found in around 22% of children (n = 24), 12 of which (11%) met the criteria for Tourette syndrome. Chronic motor or vocal tics were found in 4 girls (36% of girls participating in the study) and in 20 boys (21.2%). However, the authors did note that the increase in the observed tics was correlated with the degree of mental impairment, which was also found to be the case among mentally impaired children with no diagnosis of autism.

Simonoff et al. [33] conducted a literature review of studies on links between autism and other neuropsychiatric disorders and found the comorbidity of ASD and chronic motor or vocal tics to be around 9%, and 4.8% for TS. Another literature review, conducted by Kalyva et al. [34], found that only two new original studies were published in the English speaking community after 2010. One of them was a study conducted by Pringsheim and Hammer [35], which included 114 children with chronic motor or vocal tics, in which the authors found the comorbidity of autism spectrum disorder to be 12.59%. The second one was a study by Gjevik et al. [36] in which the comorbidity of Tourette syndrome was 8% (n = 11) in the group of 71 children diagnosed with autism spectrum disorder. Based on a comprehensive literature review going back to 1986, Kalyva et al. [34] found the comorbidity of tics and ASD to be around 4–5% in studies of large populations and 9–12% in the case of properly designed studies of smaller populations. In studies on small populations, the comorbidity of tics and ASD could be as high as 77%. All this shows that there is probably a significant pathogenetic relationship between tics and ASD, which requires further scientific investigation.

Darrow et al. [37] analyzed 313 children and 241 adults diagnosed with Tourette syndrome, as well as 10 children and 224 adults without a diagnosis of TS. 64.5% of the studied individuals (n = 545 persons) were boys and men, while in the Tourette syndrome group of children they constituted 81.6% (n = 294), and 66.8% (n = 161) among adults. In this study, the comorbidity of TS and ASD was found to be 22.8% in children diagnosed with TS, and 8.7% among adults. In the entire TS group, the prevalence of ASD features was 18%. At the same time, the coexistence of autism features among individuals without a diagnosis of TS was 3%. In the group of patients with coexisting features of autism and TS, 3.9% were women and girls, while in the TS group with no autistic features women constituted 21.2%. No statistically significant differences were observed between sexes in terms of prevalence of ASD and TS comorbidity. At present, the literature does not provide sufficient studies focusing on the analysis of girls in terms of comorbidity of tics and autism. The only study found in the process of analyzing available literature which undertakes a detailed analysis in terms of sexes was a study conducted by Canitano et al. [32]. However, it should be mentioned that the study incorporated a very small group (n = 11), which makes the obtained results unreliable. Darrow et al. [37] mention a proportion of women in the TS+ASD and TS-ASD groups, yet, they do not provide detailed distributions or demographic profile of women and only mention that there are no significant differences between the sexes.

The issue of ADHD and autism comorbidity is significant from the perspective of both clinicians and scientists. Before 2013, this area did not arouse such interest. This resulted mainly from the structure of four previous editions of the DSM which excluded a possibility of formulating a diagnosis of both these disorders simultaneously. This limitation was eliminated in the 5th edition of DSM in 2013, which enabled comprehensive studies on comorbidity of these two neurodevelopmental

disorders [38]. However, despite the aforementioned, since 2003 there have been publications which analyze the presence of ADHD features in children with autism spectrum disorder. In the available sources of that period, the prevalence of ADHD is estimated to be 52–68% in children with ASD [39]. One of the more interesting research studies of that period was published by Holtmann et al. [40]. It was carried out on 182 children who met the criteria for autism diagnosis. 41 girls and 141 boys with the mean age of 10.5 years were analyzed. To assess the ADHD features the Child Behavior Checklist questionnaire was applied. In the course of the statistical analysis, it was observed that autistic girls with co-existing symptoms of psychomotor hyperactivity with attention deficit significantly more often manifested behavior that beached the law, while boys manifested a greater degree of anxiety as well as depressive features. At this point, Holtmann et al. pay attention to the fact that the results may suggest much greater deficits in terms of planning and executive functions in these girls and also that the results may be burdened with interpretation bias, as the parents of these children expect their daughters to behave in a more socially acceptable way than their sons [40].

Another study, conducted by Sinzig et al. [39], was based on the group of 83 children diagnosed with autism, including 13 girls and 70 boys. In the entire population, 53% of patients met the ADHD criteria according to DSM-IV – in the group of girls it was 46%, and boys – 54% ($p > 0.05$). However, a vast disproportion between sexes should be taken into consideration, as well as an objectively low numerical force of girls. In a study conducted by Van Der Meer et al. [41], the group of 644 children aged between 5 and 17 years were recruited in a random way from the population-based study *Biological Origins of Autism* (BOA). The participants were divided in terms of manifested clinical symptoms into three study groups and a control group. The first group, consisting of 109 subjects, included patients diagnosed only with ADHD. The second group, consisting of 59 subjects, included ADHD and autistic features. The third group, consisting of 58 persons, included autism with ADHD features. The control group included 418 neurotypic children. The lowest percentage of girls – 13.8% — was in the third group. In the second group it was 18.6%, while in the first one it was 33.9%. Such distribution of sexes may first and foremost result from great difficulties in diagnosing autism in girls. It is also worth noting that this study does not include persons with autistic features with no accompanying features of ADHD. In a study conducted by Taylor et al. [42], parents of 5,356 pairs of twins filled in questionnaires to assess autistic and ADHD features referring to the period between 8th and 12th year of age of their children. A total of 2,551 boys and 2,805 girls were analyzed. The analysis revealed that the presence of ADHD features at the age of 8 was a statistically significant predictor of occurrence of features of autism spectrum disorders. What is interesting, an inverse dependency was not observed. In the analysis in terms of sexes, the authors described a considerably stronger relation

between autistic features and ADHD features for boys ($r = 0.41$; $p < 0.05$) than girls ($r = 0.23$; $p < 0.05$).

In a study conducted by Miodovnik et al. [43] in 2015, based on a group of 1,451 children diagnosed with autism, the history collected from the guardians revealed that for 47.9% of the studied patients a diagnosis of ADHD was formulated in the past. In 313 children (20.9%) the ADHD diagnosis preceded autism (in this group, girls constituted 12.4% of the population), in 392 (27%) a diagnosis of both ADHD and autism was made simultaneously (in this group, girls constituted 11.2% of the population), while in 746 (51.4%) – only autism was diagnosed. In 42% of girls ($n = 112$) the coexistence of ADHD and autism was diagnosed, while in boys this percentage was 50.08% ($n = 596$). The analysis of data collected on the basis of phone interviews revealed that comorbidity of ADHD and autism reached up to 10% ($n = 1,952$) of the entire studied population. Similar results were obtained by Jensen and Steinhausen [44] in a retrospective study on the group of 14,825 patients diagnosed with ADHD, where 12.4% ($n = 1,842$) of children met the ADHD criteria. In the group of girls, the coexistence of both disorders was observed in 9.2% ($n = 282$), while in boys in 13.3% ($n = 1,560$). Zablotsky et al. [45], in the questionnaire study, found the percentage of children diagnosed with autism at the level of 13% in the group of 2,464 children diagnosed with ADHD.

Available studies focused on comorbidity of ADHD and autism are scarce and are mainly represented in the form of questionnaire and retrospective studies. On the basis of the analysis of the available literature it can be concluded that in the group of patients with autism spectrum disorder, the prevalence of ADHD is approximately 20%. In the group of ADHD patients, autism is present in approximately 10–13% of patients. The frequency of comorbidity of ADHD and autism is slightly lower in girls than in boys.

Eating disorders in girls and women with autism

The authors of scientific papers as well as clinicians concerned with ASC female patients stress the possible relation between autism and eating disorders (ED), particularly anorexia nervosa (AN). The first researcher to notice a potential link between ASC and AN was described in 1980s by Christopher Gillberg [46]. The author noted that a few female cousins of ASC boys were diagnosed with AN.

Both ASC and AN are characterized by the presence of obsessive, limited and repetitive patterns of behaviors and interests, predisposition to strict routines, difficulties with social interactions including social isolation and significant difficulties with social communication. However, the rate of ASC and AN occurrence varies between men and women with AN being significantly more prevalent in women. In ASC individuals the symptoms are present since early childhood, yet AN patients develop the first symptoms typically in adolescence period or early adulthood. The apparent partial convergence of

ASC and AN symptom profiles pose several questions for researchers and clinicians, such as whether they are two different conditions, whether AN may be an atypical presentation of ASC, and therefore should be included in autism spectrum [47].

ASC individuals often present atypical or disturbed patterns of eating, as well as food related behaviors and habits. These include atypical sensory sensitivity, food refusal, limited diet variety and associated significant dietary limitations. Bandini et al. [48] showed that selectiveness in food intake in ASC individuals in early childhood is also present in adolescence period. In another study, Karjalainen et al. [49] indicated that in the group of young adults and adult patients with neurodevelopmental disorders abbreviated as ESSENCE (Early Symptomatic Syndromes Eliciting Neurodevelopmental Clinical Examinations), ADHD and/or ASC in comparison with general population the overrepresentation of ED symptoms may be observed. ED gender ratio among the study population was 2.5:1, which significantly differentiates this group from general population, in which for every 8–10 women with a diagnosed AN or bulimia nervosa (BN) there is one man with this diagnosis. Moreover, the authors observed that young adults or adults with ADHD focused more on thinking about calories and dissatisfaction with their body than ASC patients. Bölte et al. [50] showed that some patients with ASC (28% in the study group) had a low body mass and their BMI was 5 percentile or lower.

However, other publications demonstrate the occurrence of ASC symptoms in AN patients as well as in patients with other eating disorders. Dell'Osso et al. [51] reported that the patients with various eating disorders, including AN (both subtypes), BN and binge eating disorder (BED) have autistic-like features and in comparison with control group demonstrate more subthreshold symptoms of ASC. Researchers emphasize that ASC and AN cognitive and behavioral profiles are similar in many aspects. Adult women with AN compared with control group obtain higher scores in abbreviated version of the Autism Spectrum Quotient (AQ-10), yet Westwood et al. [52] in their paper demonstrated that 23.3% of adult female subjects with AN obtained the scores above cut-off point in for ASC in the ADOS-2. The previous systematic reviews indicated ASC overrepresentation in AN population [53]. However, with further exploration of this subject more doubts have come to light, which require further explanation in order to understand the stipulated relations between ASC and AN.

Westwood et al. [54] emphasized that multiple previous studies lack sufficient information regarding patient's development, including the factors exacerbating hunger and ASC symptom evaluation is solely based on the results obtained on the basis of the AQ questionnaire (self-assessment questionnaire, the Autism Spectrum Quotient), which makes the interpretation of the results very difficult. Therefore, the authors recommend more accurate assessment of ASC symptoms in future studies. Moreover, the researchers indicate many limitations and methodological differences in previous papers as well as the multiple scope of tools [55]. Previous studies often

evaluated adult patients and the data concerning their development was often limited. Similarly, the analysis of hunger effects on the obtained results was omitted and ASC symptom assessment was insufficient [53, 54]. The studies of younger population of patients and inclusion of the data concerning development did not show significant dependencies between autism and AN. Pooni et al. [56] focused on patients between 8 and 16 years of age with diagnosed eating disorders of early onset and also took into account their complete developmental history. They concluded that ASC diagnosis in the study group of patients with ED was not more frequent than in the control group. However, limited and repetitive behaviors as well as social isolation were more often found in ED group. Similarly, Rhind et al. [57] concluded that with regard to patient's developmental history only 4% of the study group of ED teenagers met ASC criteria.

Of particular importance is considering hunger confounders. As early as in 1950, Keys proved that many acute physiological, psychological and cognitive disturbances may be caused by hunger, as it is observed in AN individuals. The described abnormalities reflect many symptoms commonly associated with ASC. However, ASC-like symptoms are in this case eliminated by eating and normal body mass regain. This led the researchers to conclude that some of the observed similarities may be better understood as a 'state' (caused by transient hunger) than an associated 'trait' [57].

Adult women with autism

A number of women with autism have written their autobiographies offering their advice and help to others on navigating the difficulties which girls and women with autism experience. These autobiographies confirm how difficult it is for adult women with autism to access appropriate support and being taken seriously by service providers who often do not believe these women can have this condition.

There are many undiagnosed adult mothers with autism who have been emerging and they give their insight into pregnancy and motherhood after receiving the official diagnosis [16]. The research on the sexuality among women with autism is rare and complicated with different cultural expectations and numerous taboos around this topic. Some women with autism report homosexuality while George and Stokes [10] report higher rates of homosexuality, bisexuality and asexuality among adults with autism. Rynkiewicz [3] and Ormond et al. [9] highlight importance of sensory difficulties which may also affect sexuality of females with autism. Women with autism are vulnerable because of their social naiveté and other difficulties due to autism. They are prone to sexual abuse and rape and, because of that, they need increased therapeutic support from those who work with this population [10, 16].

Many high-functioning women with autism are passionate about variety of topics and can have intense interests as well. However, the themes may not be traditionally linked to autism such as the literature, arts, languages, human or animal behavior, psychology, special education, speech and language therapy, medicine, fashion, cosmetics,

theater, dance, etc. which are reported in literature [3, 9, 16]. Women with autism can become successful professionals and are recognized as high-class specialists in their field, and typically the area of their interest or expertise becomes the field of their employment [58]. However women with autism often struggle to maintain a long-term employment unless the appropriate support is provided [16, 58–60]. As Hendrickx [58] reports, the difficulties come from stress due to the social nuances and complexities in the workplace but also from the sensory overload they experience and which stem from their autism.

Recently there has been an increasing number of research focusing on sex differences in autism and females with autism spectrum. For the first time the abnormalities in the sensory profile were included to the DSM-5 autism criteria, which is beneficial for ASC female patients. At the same time, the awareness of the society, including medical professionals, about females with autism has been not sufficient or even low in many countries. Unfortunately, many girls and women with autism do not have access to therapy used in autism due to lack of the correct diagnosis or too late diagnosis, and there are still diagnostic instruments used in everyday practice which do not have the construct including the female autism phenotype thus not being sensitive enough to diagnose these patients properly [16]. However, timely diagnosis can reduce the difficulties that females with autism experience, allowing to better assess females' needs in the area of health, education, leisure, social relationships, and employment. [16, 59, 60].

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