



# Autism-spectrum disorders in adolescence and adulthood: focus on sexuality

Daniel Turner<sup>a,b</sup>, Peer Briken<sup>b</sup>, and Daniel Schöttle<sup>c</sup>

## Purpose of review

The combination of the core symptoms, characterizing individuals with autism-spectrum disorder (ASD), can lead to problems in romantic relationships and sexual functioning. The purpose of this article is to review studies on sexuality in individuals with ASD published since January 2016.

## Recent findings

Individuals with ASD and especially women show a higher diversity in sexual orientation in comparison with the non-ASD population. Furthermore, ASD women are more frequently in a relationship and usually report more previous sexual experiences. Up to now, sexual education programs specifically addressing the needs of the ASD population were scarce, which was criticized by patients, their parents, and caregivers. With the development of the Tackling Teenage Training program, a psychoeducational intervention designed specifically for ASD individuals was introduced, leading to significant improvements in psychosexual functioning and knowledge. Such programs are needed because a considerable rate of problematic sexual behaviors, including public masturbation and paraphilic sexual interests were found in the ASD population.

## Summary

Just like their typically developing counterparts, individuals with ASD show the whole range of normal-to-problematic sexual behaviors. Improving sexual knowledge could lead to less inappropriate sexual behaviors and could improve sexual health as part of a healthy and satisfying life.

## Keywords

Asperger's syndrome, autism, inappropriate sexual behaviors, sexual education, sexual orientation, sexual problems, sexuality

## INTRODUCTION

Autism-spectrum disorders (ASD) are characterized by impairments in social interaction and communication skills, repetitive and stereotyped interests and behaviors, as well as peculiarities in sensitive perception [1]. It is estimated, that up to 1% of the population is affected with more men than women (around 3–4 : 1) being diagnosed with ASD throughout their lifetime [2,3<sup>■</sup>]. Despite the high prevalence of ASD and the great importance of sexuality on physical and mental health, systematic studies on sexuality in individuals with ASD are scarce and most of the hitherto existing research has focused on men with ASD, although certain sex-specific differences can be found in the ASD population [4–8,9<sup>■</sup>]. There still exist many stereotypes about ASD individuals, referring to them as sparsely interested in social and romantic relationships or as asexual [6,10,11]. In contrast to these false beliefs, previous studies have shown that sexuality matters very well in ASD

individuals [6,12–14,15<sup>■</sup>,16<sup>■</sup>] and most ASD individuals report a general interest in solitary and dyadic sexual behaviors just like their clinically nonaffected counterparts [4,17,18,19<sup>■</sup>,20<sup>■</sup>,21,22,23<sup>■</sup>]. However, there are also certain sexuality-related differences between the ASD and non-ASD population, especially concerning the frequency of sexual problems [9<sup>■</sup>,24].

Individuals with ASD show the whole range of intellectual functioning, from severe intellectual

<sup>a</sup>Department of Psychiatry and Psychotherapy, University Medical Center Mainz, Mainz, <sup>b</sup>Institute for Sex Research and Forensic Psychiatry and <sup>c</sup>Department of Psychiatry and Psychotherapy, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

Correspondence to Peer Briken, MD, Institute for Sex Research and Forensic Psychiatry, University Medical Center Hamburg-Eppendorf, Martinstraße 52, 20246 Hamburg, Germany. Tel: +49 40 7410 54564; fax: +49 40 7410 56406; e-mail: briken@uke.de

*Curr Opin Psychiatry* 2017, 30:409–416

DOI:10.1097/YCO.0000000000000369

## KEY POINTS

- Individuals with ASD show a greater diversity in sexual orientation compared with healthy controls and this accounts especially for ASD women.
- Fewer individuals with ASD have a sexual or romantic relationship, whereby this accounts especially for ASD men.
- Most individuals with ASD report about previous sexual experiences, most frequently solitary sexual behaviors, for example, masturbation.
- Sex education for adolescents with ASD has been criticized because it is rarely orientated at the needs of the ASD population, however, first structured educational programs have been developed.
- Individuals with ASD report about problematic sexual behaviors, including hypersexuality, paraphilic disorders, asexuality, and gender nonconforming feelings.

disability to above average cognitive functioning and IQ. It was suggested that individuals with ASD and some kind of intellectual disability have even more pronounced impairments in social and communication skills and present more severe challenging behaviors, including sexually nonnormative behaviors [22,25–27]. However, even if individuals with ASD have quite normal cognitive and language skills (such as individuals with high-functioning autism or Asperger's syndrome), the deficits in intuitively understanding social and nonverbal communication cues and difficulties in taking the perspective of others complicate the development of romantic and sexual relationships [28,29]. This becomes particularly apparent during adolescence [30], whenever romantic and sexual relationships become increasingly important and complex [15<sup>a</sup>,31,32] and the development of ASD individuals' social skills cannot keep up with the increasing social demands [33]. Given the high prevalence rates of ASD and the great impact of sexual matters in the lives of individuals with ASD, a better understanding of this sensitive issue would help to develop interventions that specifically address the needs of this special population.

The purpose of the present article is to review and summarize current research on sexuality in individuals with ASD that has been published in the last 20 months.

## METHODOLOGY

The databases PubMed and PsycINFO were searched for empirical studies that were published between

January 2016 and August 2017. The following terms were used for the literature search: 'Asperger', 'autism', 'autism-spectrum disorder', 'high-functioning autism', 'sexuality' and 'sexual'. Cross-references to literature that was not published within the according time period were also included, if relevant for the purpose of the present review.

Our search revealed 11 articles that met the inclusion criteria. These articles could be assigned to the following topics: sexual orientation, solitary and dyadic sexual behaviors and sexual relationships, sexual education, and sexual problems and sexual disorders. Table 1 provides an overview of the included studies.

## RESULTS

### Sexual orientation

Regarding sexual orientation, there is evidence that in individuals with high-functioning or Asperger autism, although mainly regarded as being heterosexual, [39] higher rates (up to 15–35%) of homosexual or bisexual orientation than in nonclinical populations can be observed [12,22].

Using an online questionnaire, Dewinter *et al.* [16<sup>a</sup>] found a greater variety of sexual orientation in a sample of 675 male and female ASD individuals (mostly high-functioning) compared with more than 8000 healthy controls. This accounted especially for the ASD women. Only 56% of ASD women indicated that they feel attracted to men compared with almost 90% of the female healthy controls. Furthermore, 22% of ASD women reported being bisexual, 6% being homosexual and the remaining 14% indicated feeling attracted neither to men nor women. In contrast, about 80% of ASD men answered that they are attracted to women compared with 90% of the male healthy controls. Moreover, 5% of ASD men indicated being homosexual and 8% being bisexual.

Fernandes *et al.* [34<sup>a</sup>] assessed sexual orientation in two different samples of ASD individuals. The first sample consisted of 108 ASD individuals with severe-to-mild intellectual disability and relied on parent or caregiver reports. The second sample comprised 76 high-functioning ASD individuals who were assessed using self-report. Thereby, 60% of the low-functioning ASD patients showed a sexual interest towards the opposite sex compared with 89% of those without intellectual impairments. However, it has to be noted that all of the high-functioning individuals were men, whereas one-third of those with cognitive impairments were women.

May *et al.* [35<sup>a</sup>], assessing sexual orientation in a computer-assisted self-interview, also found lower

**Table 1.** Overview of studies on sexuality in individuals with autism-spectrum disorder published between January 2016 and August 2017

Author	Type of autism	Sample	Method	Main results
Dekker <i>et al.</i> [15 <sup>■</sup> ], Netherlands	Mild cognitive impairment to high-functioning ASD IQ <sub>ASD</sub> = 98.6 (SD = 17.9); range: 54–135	79 ASD vs. 131 healthy controls Age <sub>ASD</sub> = 16.8 years (SD = 2.1 years) Sex <sub>ASD</sub> = 11 women (19.9%)	Development and validation of Teen Transition Inventory (TTI): a self-report and parent-report measure of psychosexual functioning	Moderate-to-good internal consistencies for all subscales in self-report and parent-report version of the newly developed Teen Transition Inventory. ASD adolescents self-reported less sexual knowledge and more problems with sexual self-esteem and perceived social competence in sexual situations. No differences in sexual preference, age of onset of sexual behaviors, online sexual activities, and length of current relationship. On the basis of parent reports, adolescents with ASD show less experience with typical sexual behavior (e.g. French kissing), and more inappropriate sexual behaviors.
Dewinter <i>et al.</i> [16 <sup>■</sup> ], Netherlands	No information provided	675 ASD vs. 8064 healthy controls Age <sub>ASD</sub> = 43.2 years (SD = 13.5 years) Sex <sub>ASD</sub> = 349 women (51.7%)	Online self-report questionnaire	ASD individuals reported more variation in sexual orientation, because less ASD individuals (especially women) indicated being heterosexual. One quarter of ASD women had gender nonconforming feelings.
Dewinter <i>et al.</i> [17], Netherlands	Below average to above average intelligence IQ <sub>ASD</sub> > 70	8 ASD Age <sub>ASD</sub> range: 16–20 years	Semi-structured interview	All participants had been exploring their own sexuality, most frequently with masturbation. More than 50% also had partnered sexual experiences. Sexual problems indicated by the participants included no sexual arousal at all and hypersexuality.
Dewinter <i>et al.</i> [19 <sup>■</sup> ], Netherlands	High-functioning ASD IQ = 104.3 (SD = 15.9)	43 ASD adolescent–parent dyads Age <sub>ASD</sub> = 16.7 years (SD = 0.8 years); range: 15–18 years Sex <sub>ASD</sub> = 43 men (100%)	Self-report questionnaire Parent-report questionnaire	Almost all ASD adolescents reported about previous experiences with masturbation and orgasm and about a third had sexual intercourse with a girl. Most parents were well aware of their child's sexual experiences and sexual behaviors, however, parents tended to underestimate the amount of sexual experiences of their children.
Dewinter <i>et al.</i> [20 <sup>■</sup> ], Netherlands	Borderline cognitive functioning to high-functioning IQ <sub>ASD</sub> range: 76–142	30 ASD vs. 60 healthy controls Age <sub>ASD</sub> = 18.6 years (SD = 1.0 years) Sex <sub>ASD</sub> = 30 men (100%)	Online self-report questionnaire	More adolescents with typical development reported about partnered sexual experiences (e.g. French kissing, petting with clothes on) No differences in the number of individuals with experiences in masturbation, oral sex, penile–vaginal intercourse, anal sex, and watching online pornography.
Strunz <i>et al.</i> [23 <sup>■</sup> ], Germany	High-functioning ASD	229 ASD Age <sub>ASD</sub> = 34 years Sex <sub>ASD</sub> = 92 men (40%)	Paper–pencil and online self-report questionnaires	About one quarter identified themselves as homosexual or bisexual, or unsure. Seven percent of the total sample indicated no interest in romantic and sexual relationships at all.

**Table 1 (Continued)**

Author	Type of autism	Sample	Method	Main results
Fernandes <i>et al.</i> [34 <sup>■</sup> ], Sweden	Low and high functioning ASD IQ range: less than 50 to greater than 85 Study 1: mainly low-functioning Study 2: high-functioning	Study 1: 108 ASD Age <sub>ASD</sub> = 25.0 years (SD = 6.4 years) Sex <sub>ASD</sub> = 30 women (28%) Study 2: 76 ASD Age <sub>ASD</sub> = 22.0 years (SD = 4.5 years) Sex <sub>ASD</sub> = 76 men (100%)	Study 1: Interview with parent or other caregiver Study 2: Self-report questionnaire	Study 1: About one third of the individuals showed inappropriate sexual behaviors, most frequently masturbation in public and indecent exposure and one-third was described as having no evident sexual interest. Study 2: Almost 90% reported being heterosexual. One quarter of the sample indicated hypersexual or paraphilic sexual interests, most frequently voyeurism and fetishism.
May <i>et al.</i> [35 <sup>■</sup> ], Australia	Low-functioning to high-functioning ASD	94 ASD vs. 3454 healthy controls Age <sub>ASD</sub> = 178.9 month (SD = 3.8 month) Sex <sub>ASD</sub> = 73 men (77.5%)	Audio computer-assisted self-interview	Women with ASD were less likely to have a heterosexual orientation compared with healthy control women. No differences in the number of ASD individuals and healthy controls who reported ever having had sex.
Mackin <i>et al.</i> [36 <sup>■</sup> ], USA	Low and high functioning ASD	15 ASD Age <sub>ASD</sub> = 16.4 years; range: 14–20 years Sex <sub>ASD</sub> = 14 men (100%)	Telephone interview with parents	Almost all parents answered that they provided sexual education to their child and most parents (n = 10) indicated that their child received sexual education in school. Topics addressed most frequently during sexual education were: sexual relationships, anatomy and physiology of sexual functioning, self-advocacy, consequences of sex, birth control, personal boundaries and pornography.
Hannah and Stagg [37 <sup>■</sup> ], United Kingdom	High-functioning ASD	20 ASD vs. 20 healthy controls Age <sub>ASD</sub> = 18.6 years (SD = 1.0 years) Sex <sub>ASD</sub> = 12 men (60%)	Self-report questionnaire	ASD individuals reported less sexual consciousness, less sexual assertiveness and less sex appeal consciousness. No differences were found concerning feelings towards sex education and the perceived need for sex education.
Visser <i>et al.</i> [38 <sup>■</sup> ], Netherlands	High-functioning ASD	189 ASD adolescents age range: 12–18 years Sex <sub>ASD</sub> = 151 men (80%)	RCT on psychosexual training program for adolescents with ASD	Participants in the intervention group demonstrated a significantly greater increase in psychosexual knowledge.

ASD, autism-spectrum disorder; RCT, randomized controlled trial.

rates of heterosexual and higher rates of bisexual orientation in 14–15-year-old female ASD adolescents compared with healthy controls, whereas there were no differences in sexual orientation between the male ASD individuals and healthy controls. Furthermore, a significant number of ASD women indicated uncertainty whenever asked about their sexual orientation. In another recent study by Strunz *et al.* [23<sup>22</sup>], 10% of the included 229 ASD individuals self-reported being bisexual, 7% homosexual and 14% were not able to 'label themselves'.

### Solitary and dyadic sexual behaviors and sexual relationships

In a qualitative study, eight adolescent boys (aged 16–20) with ASD were interviewed about their sexual experiences and behaviors [17]. All boys were interested in sexuality and sexual relationships and reported about previous sexual experiences, most commonly masturbation. More than half of the participants also had partnered sexual experiences and three were currently in a relationship. Although most participants described their partnered sexual experiences as positive and pleasurable, there were also some challenges relating to sensory processing issues, obsessive interests and problems with social and communication skills, leading to relationship problems.

Similarly, of the 43 ASD adolescents in the study of Dewinter *et al.* [19<sup>18</sup>] more than 95% indicated previous sexual experiences, again most frequently masturbation, followed by French kissing, and petting above clothes. Furthermore, about one quarter of the participants reported about previous sexual intercourse, whereby three individuals were forced to do sexual things. In contrast to the self-reports, the parents of the ASD adolescents mainly underestimated the amount of sexual experiences of their children. For example, only 50% of the parents were of the opinion that their child masturbated before.

In one of the few longitudinal studies in this area, high-functioning adolescent boys self-reported about their lifetime sexual experiences and were compared with a non-ASD control group [20<sup>19</sup>]. The study was a follow-up evaluation, two years after the initial assessment and the ASD individuals were on average 18 years of age at the follow-up. Although the results demonstrated many similarities in the sexual experiences of boys with ASD and their nonaffected peers, significantly fewer boys with ASD had partnered sexual experiences (e.g. French kissing and petting). Interestingly, the ASD boys made less use of condoms during sexual intercourse and reported more regrets about their first

sexual experiences. No clear relationship between amount of ASD symptoms and partner-orientated sexual experiences was found, suggesting that probably other mechanisms (e.g. anxiety, less desire) might have influenced sexual behaviors [20<sup>19</sup>].

In contrast, no difference in the number of ASD and non-ASD adolescents with previous sexual or relationship experiences was found in the interview study of May *et al.* [35<sup>34</sup>]. However, with a mean age of 15 years, the participants were slightly younger than in the Dewinter *et al.* [20<sup>19</sup>] study, which could have accounted for these differing findings. Whenever comparing those with previous sexual experiences, ASD girls were significantly younger at their first sexual intercourse and had a higher number of sexual partners than the non-ASD girls.

Strunz *et al.* [23<sup>22</sup>] found that the majority of individuals with ASD had previous experiences with romantic relationships and just 7% of the 229 participants did not have a desire for sexual relationships at all. Those without any experiences in romantic relationships were more likely to be men and younger. Moreover, being in a relationship with another autistic person led to a higher relationship satisfaction.

### Sex education

In a qualitative survey, Mackin *et al.* [36<sup>35</sup>] conducted telephone interviews with parents of 15 ASD adolescents asking them how they provide sex education to their children. It was found that almost all parents provided sex education to their child, however, they acknowledged that sex education should also be provided by other sources, including health-care providers and school. Sexuality related topics their children should be educated about included: sexual relationships, anatomy and physiology of sexual reactions and behaviors, consequences of sex, birth control and personal boundaries, whereas pornography, fetishisms, and sex trafficking were among the topics that according to the parents' opinion should not be addressed in sex education. Furthermore, many parents feared that sex education was not oriented at the special needs of the ASD population and they recommended that it should be presented visually, interactive, specific to ASD, technology-based, and self-paced.

Hannah and Stagg [37<sup>36</sup>] also compared the perception of adequacy of sex education provision in a sample of young adults with ASD. However, in contrast to Mackin *et al.* [36<sup>35</sup>] they asked the ASD individuals themselves using two quantitative measures (the sexual knowledge, experience, feelings and needs scale, SexKen [40] and the sexual awareness questionnaire, SAQ [41]) and a qualitative

interview. On the quantitative measures, individuals with ASD did not differ concerning sexual knowledge and did not report a greater need for sex education compared with the healthy controls. However, in the qualitative analysis, the ASD individuals revealed more difficulties in sexual experiences and indicated a lack of educational provision that adequately met their needs. Furthermore, the ASD individuals reported about higher levels of social anxiety and noted that they were excluded from peer discussions about sexuality more often. They also acknowledged a subjective vulnerability of becoming a victim of sexual abuse, which was not reported by the healthy controls.

Visser *et al.* [38<sup>■</sup>] studied in a 1-year randomized controlled trial, the effect of the Tackling Teenage Training (TTT) program, in which cognitively able adolescents (12–18 years old) with ASD received psychoeducation (regarding puberty, sexuality and intimate relationships) and practiced communicative skills. Especially sexual knowledge of the younger participants increased during the program, shown in self-rated and parent-rated knowledge tests. Furthermore, parents reported that their children were more capable of recognizing interpersonal boundaries in social and intimate situations. The authors remarked that the concerns some parents might have, for example, talking about sexual issues could be misinterpreted and thereby increase the amount of sexual problems, were not supported by the results of the study [38<sup>■</sup>].

### Sexual problems and sexual disorders

Dekker *et al.* [15<sup>■</sup>] reported about the development and psychometric evaluation of a new parent-report and self-report questionnaire, the Teen Transition Inventory (TTI), that assesses psychosexual functioning of individuals with ASD on three subscales: psychosexual socialization, psychosexual selfhood and sexual/intimate behavior. Regarding psychosexual socialization, significant differences in both self-report and parent-report between the ASD and healthy control groups were found concerning 'friendship skills', 'social acceptance by peers' and 'adequately dealing with boundaries'. The authors stated that having more peer problems was correlated with less social competence, which conversely is a prerequisite for psychosexual functioning leading to more problems in this area. In the domain 'psychosexual self-hood', the ASD group reported about more problems in sexual knowledge, sexual self-esteem and perceived social competence. Furthermore, whereas no significant differences were found in sexual/intimate behavior in the self-reports, the parents reported differences in amount

of sexual/intimate behavior and amount of inappropriate sexualized behaviors (e.g. related to allowing and seeking physical contact with family members or well known acquaintances). This underlines the usefulness of using multiple informants to weigh out possible over pathologization by parents or reduced self-reflection of ASD participants (possibly making self-reports less reliable) [15<sup>■</sup>].

Comparably, in the study of Fernandes *et al.* [34<sup>■</sup>], 30% of the low-functioning ASD patients showed some kind of inappropriate sexual behaviors, most frequently public masturbation, indecent exposure and inappropriate heterosexual behaviors. Of the high-functioning individuals, 10% reported about inappropriate sexual behaviors, including inappropriate heterosexual behaviors and indecent exposure. Furthermore, 24% of the high-functioning individuals indicated paraphilic sexual fantasies or behaviors, including voyeurism, fetishism, sexual interest in children, sadomasochism and transvestic fetishism. Another 7% of the high-functioning ASD individuals showed more than seven sexual activities per week, whereas 4% described their level of sexual activity as worrying or uncontrollable.

In the qualitative study of Dewinter *et al.* [17], sexual problems that were reported most frequently by the adolescents and young adults were problems with sexual arousal and hypersexuality. In another study by Dewinter *et al.* [16<sup>■</sup>], 22% of women and 8% of the men with ASD reported some gender nonconforming feelings, which represented markedly higher rates compared with the healthy controls.

### CONCLUSION

In contrast to existing beliefs referring to ASD individuals as asexual and not having an interest in sexuality, recent studies published within the last 20-month underscore that individuals with ASD show the whole range of normal-to-problematic sexual behaviors just like their typically developing counterparts. However, there are also some peculiarities that should be considered in sex education and therapeutic interventions.

A higher diversity in sexual orientation within the ASD population and especially in ASD women was found. It was suggested that the higher rates of homosexual or bisexual orientation in women with ASD could be because of antenatal androgen exposure resulting in masculinized behaviors [42,43<sup>■</sup>,44]. In this context, higher levels of fetal testosterone have been correlated with more autistic traits during adolescence and adulthood [42,43<sup>■</sup>,44–46]. However, this explanation does not account for the higher rates of same sex sexual orientation in men

with ASD found in some studies. The higher rates of homosexual and bisexual orientation in both male and female ASD individuals could also be because of the tendency to act more independently from social norms implying that the concepts of sexual orientation or gender roles are less relevant in ASD individuals [23<sup>■</sup>]. Furthermore, ASD individuals could rate personal traits as more important than sex whenever searching for a romantic or sexual partner. Although most ASD individuals are interested in sexual relationships, they tend to have more difficulties to find a romantic partner, which could be because of their impaired social and communication skills. Thereby, it seems as if ASD women are more likely to be in a dyadic relationship than their male counterparts, whereas ASD men report a greater desire for sexual and romantic relationships [6]. It was suggested that women with ASD might present less pronounced social and communicative deficits and special interests that are more compatible to the interests of their peer group [47–50]. Furthermore, women with ASD seem to apply coping strategies, like imitating the social skills of their non-ASD peers, therefore being more socially unobtrusive, leading to a higher likelihood to have a romantic and sexual relationship [48]. Although individuals with ASD show an interest in sexual and intimate relationships, they receive less sex education or at least less education that meets their special needs [26,42]. In the meanwhile, sexual education programs specifically developed for ASD individuals, like the TTT program have become available and seem to significantly improve sexual knowledge, especially in children and young adolescents. This is important because reduced knowledge combined with the specific social impairments and the reported hyposensitivities or hypersensitivities can not only hinder ASD individuals from making sexual experiences and learn from their peers, but also pose them at risk to develop sexual problems and challenging sexual behaviors like public masturbation, hypersexual behavior or paraphilic sexual interests. Less psychosexual knowledge and inadequately dealing with boundaries are significantly correlated in the ASD group, implying that improving sexual knowledge could lead to less inappropriate sexual behaviors and could improve sexual health as part of a healthy and satisfying life.

### Acknowledgements

None.

### Financial support and sponsorship

None.

### Conflicts of interest

*There are no conflicts of interest.*

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Papers of particular interest, published within the annual period of review, have been highlighted as:

- of special interest
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