Socio-Sexual Functioning in Autism Spectrum Disorder: A Systematic Review and Meta-Analyses of Existing Literature

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Socio-sexual functioning encompasses an individual’s interests, behaviors, and knowledge with respect to sexual, romantic, and social aspects of life. An individual’s understanding of these domains is developed through a range of informal and formal avenues of sexual health education. The current model demonstrated this and proposed that, compared to typically developing individuals, those with ASD develop socio-sexual functioning differently due to having less peer engagement, less relationship experience, more parental guidance, greater use of online materials, receive less school-based sexual health education, and more support from wellbeing services. Systematic review and meta-analysis of existing literature revealed that individuals with ASD have greater difficulty adhering to privacy norms, engage in less social behavior, are described as engaging in less appropriate sexual behavior, have greater concerns about themselves, and receive less sexual health education. Having fewer opportunities for appropriate informal and formal sexual health education leaves them at a double disadvantage from others who are receiving this information from both of these avenues. Some of the current meta-analytic results are cautioned by large I-square statistics which suggest that a degree of variance is being caused by extraneous factors. Further empirical research in this area is needed to overcome current design and sample limitations. Finally, the Sexual Behavior Scale was the most commonly utilized tool in the meta-analyzed studies, thus comprehensive evaluation of its functioning is warranted. The importance of work in this area is highlighted by the central role of social and sexual wellbeing on one’s quality of life. 


Lay Summary: Review of existing literature revealed that individuals with ASD have greater difficulty adhering to privacy norms, engage in less social behavior, are described as engaging in less appropriate sexual behavior, have greater concerns about themselves, and receive less sexual health education. Having fewer opportunities for appropriate informal and formal sexual health education leaves them at a double disadvantage from others who are receiving this information from both of these avenues.

Keywords: autism; Asperger’s; sexual behavior; relationships; privacy norms; sexual health education; sexual knowledge; socio-sexual functioning

Individuals with ASD commonly have difficulties with social communication, social-emotional reciprocity, and relationship maintenance [APA, 2013]. This is coupled with repetitive or restricted behaviors, sensory interests and aversions, or cognitive rigidity [Carcani-Rathwell, Rabe-Hasketh, & Santosh, 2006]. Although not all people with ASD show all of these characteristics to the same extent all of the time, these characteristics cause clinically significant impairment in numerous areas of functioning, often including socio-sexual functioning [Ousley & Mesibov, 1991].

Socio-sexual functioning is an immensely varied, albeit important, aspect of life. Such a term encompasses an individual’s interests, behaviors, understandings, and contentment with respect to sexual, romantic, and social aspects of life—whether they are relational or intrapersonal. As an interrelated factor of one’s sense of self and overall wellbeing, sexual functioning is central to a person’s quality of life [Anderson, 2013].

Background

Despite very early claims of asexuality in ASD populations [Zigler & Hodapp, 1986], most individuals with this disorder express a clear desire for affective, romantic, and/or sexual relationships; a need which is often heightened in higher-functioning individuals [Byers, Nichols, Voyer, & Reilly, 2012; Haracopos & Pedersen, 1992; Hellemans, Colson, Verbraeken, Vermeiren, & Deboutte, 2007; Holmes & Himle, 2014]. The level of
interest expressed by those with and without ASD may be similar, but the former group report less achieved experience in relationships [Mezhabin & Stokes, 2011; Ousley & Mesibov, 1991]. More generally, differences in managing romantic and sexual interests are common [Byers, Nichols, & Voyer, 2013; Ousley & Mesibov, 1991]. Related difficulties can lead to interpersonal issues, poor mental health, unwanted sexual contact, and community isolation for some individuals [Brown-Lavoie, Viecili, & Weiss, 2014; Hatton & Tector 2010; Koller, 2000]. Therefore, understanding how ASD is associated with socio-sexual wellbeing is important and the focus of this review.

Early research suggested that a person’s sexuality develops through their social and physical interactions and experiences, with the integration of social norms [Haracopos & Pedersen, 1992]. However, the particular pathways of such development are not clear. It is well established that the core social communication difficulties experienced by individuals with ASD are often a barrier to social engagement [Shah & Wing, 1986]. Restricted and repetitive behaviors or rigidity can also limit social experiences and social development [Horner, Carr, Strain, Todd, & Reed, 2000]. Such limited social engagement can hinder opportunities to initiate and develop romantic relationships [Ousley & Mesibov, 1991]. This is consistent with findings that individuals with ASD learn less about romantic functioning from peers and friends [Stokes et al., 2007].

The link between social and romantic functioning is supported by findings that social functioning contributes to romantic functioning [Stokes et al., 2007]. Further, social engagement has been found to mediate the association between ASD and sex-related education, and that when sex-related education is held stable, the association between ASD and social engagement is no longer statistically significant [Stokes & Kaur, 2005]. Previous studies have found less experience in romantic relationships reported by those with ASD [Holmes & Himle, 2014], while others have found similar rates across groups [Dewinter, Vermeiren, Vanwesenbeeck, Lobbestael, & Van Nieuwenhuizen, 2015].

Social functioning and awareness may be related or separate to higher rates of inappropriate sexual behaviors displayed in public, by individuals with ASD [Coskun, Karakoc, Kircelli, & Mukaddes, 2009; Hellemans et al., 2007; Holmes & Himle, 2014]. Furthermore, although empirical research is scant, differences in sensory experiences and sensitivity, common in ASD, may also impact on experiences of physical contact with romantic or sexual partners [Aston, 2005; Henault, 2005].

With fewer opportunities to learn from peers, some parents or teachers of children with ASD provide more guidance about sexual wellbeing to fill this gap [Koller, 2000]. However, differences in the amount of parental guidance across ASD and non-ASD groups may not differ [Stokes & Kaur, 2005]. For the same reason, it is possible that individuals with ASD rely more heavily on what they have seen online to inform their romantic and sexual understandings [Stokes et al., 2007]. This is of increasing relevance given growth in technology and social media use over the past two decades [Lenhart, Purcell, Smith, & Zickuhr, 2010]. Forty-six percent of individuals with ASD have reported talking about sex on the internet, compared to 27% of the general population sample [Dewinter et al., 2015]. While 19% reported specifically accessing information about sexuality on the internet; comparison to rates within a typically developing (TD) group was not made [Mladenovska & Trajkovski, 2010]. While this may provide an appropriate avenue for access to information, where biased material is presented, ill-conceived and inappropriate ideas and norms may be developed [Chia & Gunther, 2006]. The occurrence such is difficult to measure and thus unclear.

When considering more structured and formalized forms of sexual health education, school-based curricula are often relied upon. However, individuals with ASD appear to receive less sexual health education than their TD peers [Stokes et al., 2007]. The reason for this is not clear. It may be that problematic behaviors or social communication difficulties limit classroom engagement. Further, sensory-seeking behaviors or auditory filtering difficulties may hinder attention [Ashburner, Ziviani, & Rodger, 2008]. Teachers may also feel uncomfortable teaching and discussing sexually-related topics [Caruso et al., 1997]; a difficulty also reported by parents [Holmes & Himle, 2014]. Comments from students with ASD qualitatively suggest that sexual education classes provide the information but that students don’t know how to apply it to life situations [Hannah & Stagg, 2016]. Thus, there is likely more reliance on support services, such as counsellors and wellbeing staff, to provide such sexual health education to individuals with ASD. This may explain why, by adulthood, individuals are reported to have adequate sexual knowledge [Byers et al., 2013, 2012]. To demonstrate these two possible avenues of sex-related education (informal and formal), and the opportunities for each based on existing literature, a dual variable theoretical model was postulated (Figure 1).

This theoretical model categorizes the common opportunities for development of socio-sexual functioning into two primary channels: informal sex-related education and formal sex-related education. Such model and categorization has not been proposed before, and importantly highlights the impact of factors outside of traditional formal sexual education.
Various theories aim to explain sexual development from different conceptual frameworks. Essentialist theories focus on biology, while social constructionist theories focus on meaning and social concepts; for overview of established theories, see Tolman and Diamond [2001, 2014]. Models which incorporate factors external to the individual are however less common, despite being of most relevance to clinical practice and education, thus are a core focus of this review.

Vanwesenbeeck and colleagues [1999] proposed a process-based model of heterosexual competence and risk which included external factors such as receipt of sex-related information. However, its focus on negative and potentially damaging sex-related outcomes may hinder its ability to detect more subtle differences between individuals or groups. The ‘Integrated Theory of Sexual Offending’ is a more comprehensive model but is focused narrowly on illegal sexual behavior [Ward & Beech, 2006]. The categorization of opportunities for sex-related education, into formal and informal opportunities, provides understanding relevant to clinical treatment planning. This has not been proposed in existing models, thus is valuable and unique to the current proposed model. Possibilities for intervention are the motivation and primary focus of the current model.

Research in many areas of socio-sexual functioning is limited, unconfirmed, or inconsistent. Therefore, in support of the proposed model, it was hypothesized that meta-analyses would confirm those with ASD have less engagement with peers, engage in sexual behavior that was less appropriate, and receive less school-based sexual health education. Systematic review of literature may suggest value in also measuring other areas of socio-sexual functioning.

**Method**

A comprehensive, systematic search of existing literature was first conducted; see Figure 2. Searched databases included PsycINFO, Medline Complete, Academic Search Complete, PubMed, Embase, Cochrane Library, Scopus, WorldCat, VTLS Thesis Search, Trove, Dart Europe Theses, Theses Canada, and Hong Kong University Theses Online. The search terms used are listed in Box 1.

Initial database searches produced 1,597 papers; three articles were also located on the World Wide Web. Fifty-eight papers were reviewed by full-text, 37 of these were excluded for the following reasons. Studies were excluded if they were based on a single case study [for review of such, see Dewinter, Vermeiren, Vanwesenbeeck, & Nieuwenhuizen, 2013; n = 4], as were studies of individuals with an intellectual disability (n = 9), due to the confounding nature of intellectual difficulty in such cases [Byers et al., 2013]. One was excluded because it did not actually include a sample with ASD. Thus, findings reviewed herein relate to individuals with higher-functioning ASD. Studies were also excluded due to not including measurement of behaviors relevant to sexuality, describing problem behaviors but not specifically related to sexuality (n = 10), or providing author opinion which was not supported by...
quantitative results ($n = 2$). Two studies collected samples of sexual offenders then commented that ASD traits were noted; no diagnostic assessment was undertaken. Five studies were a narrative reviews or reports that didn’t contain any new data, while another was a thesis which was not available in English, one was only available in an inaccessible book, and a further two were found to be duplicates not already identified.

To undertake such meta-analyses, the studies which did not contain a control group were eliminated ($n = 12$), leaving nine studies. Only six of these remaining studies had comparable findings, and thus could be utilized in meta-analyses (see Table 1). Meta-analyses, utilising a fixed effects model, were conducted using Review Manager (RevMan, version 5.3, Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2014). Some scales required inversion to ensure consistent measurement direction. This involved the means being subtracted from the maximum possible value of the item [Deeks, Higgins, & Altman, 2011].

Of the six studies available for meta-analyses, four studies utilized versions of the Sexual Behavior Scale (SBS). The SBS has parent-report version and a self-report version; both comprise of five scales, namely Social Behavior (parent-report $\alpha = .82$; self-report $\alpha = .92$), Privacy Awareness ($\alpha = .60$; .86), Sex Education ($\alpha = .76$; .37), Sexual Behavior (.55; .33), and Concerns about the individual’s future [.88; not reported; Stokes & Kaur, 2005; Mehzabin & Stokes, 2011]. The revised SBS-II is a parent-report measure containing scales which measure Social Contact ($\alpha = .90$), Social Insight ($\alpha = .84$), Sexualized Behavior, and Concerns ($\alpha = .94$). The Sexualized Behavior scale comprised of three subscales, namely self-directed public behavior ($\alpha = .63$), Outwardly directed behavior ($\alpha = .61$), and Invasive behavior ($\alpha = N/A$, single item).

Other questionnaires used are listed in Table 1, as are the internal consistency statistics for each study. Overall, each study reported good internal consistency for most or all of its measures. Three studies were based on
parental completion of the questionnaires, while the other three studies required the individual themselves to provide the responses. Arguments of reporter biases have been raised for both parent-report [Dewinter et al., 2015] and self-report [Mehzabin & Stokes, 2011] research designs.

Results

The results comprise of five individual meta-analyses, each evaluating a specific area of socio-sexual functioning, as prompted by the scales of the SBS. Overall, meta-analyses found differences between TD individuals and individuals with ASD in each of these five areas related to socio-sexual functioning.

Social Contact and Behavior

Individuals with ASD commonly display poorer social behavior and have less social contact than TD individuals. This has been consistently found in analysis of adolescents via parental-report [Ginevra, Nota & Stokes 2015; Kaur, 2009; Stokes & Kaur, 2005] as well as in young adults via self-report [Mehzabin & Stokes, 2011; Stokes et al., 2007]. Meta-analysis of these studies’ findings shows that having ASD has a large effect [Cohen, 1988] on level of social behavior with little to no heterogeneity (Figure 3; interpretation to follow). Four of the studies included in Figure 3A [Ginevra et al., 2015; Kaur, 2009; Mehzabin & Stokes, 2011; Stokes & Kaur, 2005] used slightly modified versions of the SBS, originally developed by Stokes and Kaur [2005], and validated by Kaur [2009].

Figure 3A-E provides forest plots; across the x-axis the standardized mean differences (commonly labelled effect size) are measured while along the y-axis the associated studies are listed. The squares each plot the effect size of that study, the size being proportional to the study’s weight in the meta-analysis, with error bars indicating the 95% confidence interval. The diamond represents the average effect size across all studies. An I² effect size of zero shows that there is no difference between the two groups; ASD and TD, indicated by the vertical line of no effect.

An effect size below zero shows that there is a difference and this effect is more pronounced for the group labeled at that end of the x-axis, while an effect size above zero shows that the effect is more pronounced for the other group. This information is also presented in numerical form to the left of the forest plot, along with the means and standard deviations for each group. Note that comparison of means between studies is not accurate given that different scales are used in some studies; thus the standardized mean difference score is best used for comparison of effect between studies.

In Figure 3A, the effect sizes of the five studies each show a bias towards TD, indicating more social behavior in TD groups. When combined, there is an effect of almost two standard deviations difference between the ASD and TD groups, being more pronounced for TD. The I² statistic indicates that 19% of the variance between studies is due to an extraneous factor other than sampling error (chance).

Awareness of Privacy

Awareness of privacy norms is lower in individuals with ASD as compared to TD groups. This has been consistently found in adolescents via parent-report [Ginevra et al., 2015; Kaur, 2009; Stokes & Kaur, 2005] and in young adults via self-report [Mehzabin & Stokes, 2011]. Meta-analysis of these findings reveal that the effect sizes of the three studies each show a bias towards TD, indicating greater privacy knowledge in TD groups (Figure 3B). When combined, there is an effect of less than one standard deviation difference between the ASD and TD groups, being more pronounced for TD. Thus, having ASD has a moderate effect on the degree of privacy awareness that an individual has. The I² statistic indicates that 0%
Table 1. Summary of Studies Included in Meta-Analyses

<table>
<thead>
<tr>
<th>Study</th>
<th>Primary country</th>
<th>Groups &amp; respondents</th>
<th>Sexual behavior measures</th>
<th>Relevant findings</th>
<th>Reliability a</th>
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<tbody>
<tr>
<td>Brown-lavioie, Viechila and Weiss [2014]</td>
<td>US</td>
<td>ASD (n = 94; MA = 27.8) TD (n = 117; MA = 27.6) Self-report.</td>
<td>Autism spectrum quotient, study-specific novel questionnaires, revised Knowledge of sexual health questionnaire, Sexual experiences survey – victim version.</td>
<td>ASD 2.6 times less likely to receive sex ed from parents, teachers &amp; peers. Less sexual knowledge (r² = .23) 78% of ASD received unwanted sexual contact; 47% of TD</td>
<td>(a = .84–.86)</td>
</tr>
<tr>
<td>Ginevra, Nota, and Stokes [2015]</td>
<td>Italy</td>
<td>ASD (n = 82; MA = 14.91) TD (n = 94; MA = 14.91) Parent-report.</td>
<td>Sexual behavior scale (SBS)</td>
<td>Fewer social behaviors (r² = .29) Greater inappropriate sexual behavior (r² = .06) Similar level of privacy knowledge (r² = .16) Greater concern for child’s future (r² = .09) Less knowledge of sex education (r² = .38)</td>
<td>(a = .60–.89)</td>
</tr>
<tr>
<td>Kaur [2009]</td>
<td>Australia</td>
<td>ASD (n = 66; MA = 14.17) TD (n = 153; MA = 15.31) Parent completed.</td>
<td>Sexual behavior scale revised (SBS-ll)</td>
<td>Effect of diagnosis on insight varied by country (r² = .08) Less social contact (r² = .07) and social insight (r² = .09) More parental concern (r² = .10) and inapp. sex beh (r² = .04)</td>
<td>(a = .61–.94)</td>
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<tr>
<td>Mehzabin and Stokes [2011]</td>
<td>Australia</td>
<td>ASD (n = 21; MAM = 25.3, MAF = 23.4)TD (n = 39; MAM = 23.7, MAF = 22.6) Self-report.</td>
<td>Sexual behavior scale (SBS)</td>
<td>Fewer social behaviors (r² = .45) &amp; sex experience (r² = .29) Similar level of privacy knowledge (r² = .11) Similar levels of public sexualized behavior (r² = .03) Greater concern for their future (r² = .16) Less knowledge of sex education (r² = .29)</td>
<td>(a = .33–.92)</td>
</tr>
<tr>
<td>Stokes and Kaur [2005]</td>
<td>Australia</td>
<td>ASD (n = 23; MAM = 12.6; MAF = 13) TD (n = 51; MAM = 13.5; MAF = 13.1) Parent completed.</td>
<td>Sexual behavior scale (SBS)</td>
<td>Poorer social beh (r² = .48) and less sex ed (r² = .27) Fewer privacy beh’s and less privacy knowledge (r² = .08) More inappropriate sexual beh’s (r² = .26) Greater parental concern (r² = .42) Less social learning (SL) from friends (r² = .54) Similar SL from parents and from formal sex ed. Level of social functioning differed (r² = .28) Social funct. contributed to rom. functioning (r² = .37) Rom. funct. differed when age controlled (r² = .40) Similar romantic learning (RL) from parents (r² = .007) Less RL from the media (d = .47) Less RL from peers and friends (r² = .50)</td>
<td>(a = .55–.88)</td>
</tr>
<tr>
<td>Stokes et al. [2007]</td>
<td>Australia</td>
<td>ASD (n = 25; MA = 22.2) TD (n = 38) Self-report.</td>
<td>Courting Behavior Scale (CBS) Designed for this study.</td>
<td></td>
<td>(a = .72–.90)</td>
</tr>
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</table>

MA = mean age; MAM = mean age of males; MAF = mean age of females; SBS = sexual behavior scale; beh = behavior; SL = social learning; RL = romantic learning; soc. = social; rom. = romantic; funct. = functioning.

a The reliability of their results are indicated by the study’s published internal consistency statistic (Cronbach’s alpha). Where multiple measurement tools (or subscales) were used, the range of Cronbach ɑ is reported.
of the variance is due to an extraneous factor other than sampling error (chance).

**Sexual Behavior**

Sexual behavior involves sexual desire, and differs from sexualized behavior, which lacks intent and is often sensory-based [Stokes & Kaur, 2005]. Thus, a sexual behavior is used to experience and express one's sexuality—either towards the self or another. More parents of individuals with ASD, compared to those of TD's, reported inappropriate sexual behaviors by their children, as found in analysis of adolescents via parent-report [Ginevra et al., 2015; Kaur, 2009; Stokes & Kaur, 2005]. The effect sizes of the four studies each show a bias towards ASD (Figure 3C). This indicates that more parents of individuals with ASD, compared to those of TD’s, reported inappropriate sexual behaviors by their children shows that having ASD has a considerable effect on levels of inappropriate sexual behavior. When

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**Figure 3.** A–E. Forest Plots. (A) Social behavior. (B) Privacy knowledge. (C) Inappropriate sexual behavior. (D) Future concerns. (E) Sexual health education.
combined, there is an effect of below one standard deviation difference between ASD and TD, being more pronounced for ASD. It can be seen that Mehzabin and Stokes’s [2011] finding was not significant, as indicated by the horizontal error bars crossing the line of no effect (Figure 3C). The lack of significance in this result may have been due to the slightly older sample used, or differences in the method of reporting. The $I^2$ statistic indicates that 88% of the variance between these findings is due to extraneous factors other than sampling error. This may reflect substantial heterogeneity, warranting caution with interpretation of these meta-analytic findings [Higgins & Thompson, 2002].

**Concern for the Future of the Individual with ASD**

A parent’s natural concern for their child’s general well-being may be heightened when their child has a condition such as ASD. Concern about the individual’s future has been consistently reported for adolescents with ASD via parent-report [Ginevra et al., 2015; Kaur, 2009; Stokes & Kaur, 2005] and in young adults via self-report [Mehzabin & Stokes, 2011]. The effect sizes of the four studies each show a bias towards ASD, indicating greater concerns in ASD groups (Figure 3D). When combined, there is an effect of over one standard deviation difference between ASD and TD, being more pronounced for ASD. Therefore, having ASD has a large effect on the level of concern about the individual. However the $I^2$ statistic indicates that a high amount of the variance (97%) is due to extraneous factors other than sampling error.

**Sex Knowledge and Education**

Individuals with ASD appear to receive less sexual health education than individuals without such condition. This issue has been found in adolescents via parent-report [Ginevra et al., 2015; Stokes & Kaur, 2005] as well as in young adults via self-report [Brown-Lavoie et al., 2014; Mehzabin & Stokes, 2011]. The effect sizes of these four studies each show a bias towards TD, indicating greater sexual health education among TD groups (Figure 3E). When combined in meta-analysis, there is an effect of over one standard deviation difference between ASD and TD, being more pronounced for TD. Therefore, an ASD diagnosis has a large effect on the level of sexual health education the individual has received. However, the $I^2$ statistic indicates that a high amount of the variance (84%) is due to an extraneous factor other than sampling error.

**Discussion**

Review of the literature in this area suggests that experiencing the social and sexual aspects of life can be different, and sometimes more difficult, for individuals with ASD, compared to those without ASD. Specifically, the current results indicate that individuals with ASD often engage in less social behavior, have less knowledge about privacy norms, engage in more inappropriate sexual behaviors, have received less sex-related education, and are subject to greater concern held by others and themselves about their future. Such difficulties are not experienced by all individuals with ASD nor are they avoided by all TD individuals; these results suggest that more individuals with ASD, compared to TD, report these experiences. The findings also require confirmation though replication and further research.

The difficulties related to socio-sexual wellbeing, as discussed, are made more challenging by the interactions between them. The theoretical model postulated herein sought to clarify the interactions of factors and proposed that socio-sexual understanding can be developed through both formal and informal sexual health education opportunities. Results from the current meta-analyses provide further support for the theoretical model. When collated with existing literature, modifications to the model are suggested, as demonstrated in Figure 4.

Those with ASD were found to have greater difficulty following and adhering to privacy norms, as supported by the current meta-analysis (path a in Figure 4). Given that such inappropriate behaviors can often occur in public, social inclusion with peers is likely to be hindered (path b). Such effects on social engagement are supported by the current meta-analysis finding of less social behavior in individuals with ASD (path c). The link between amount of social behavior and informal sexual health education is supported by the noted loss of a statistically significant association between ASD diagnosis and sexual health education when social behavior was controlled (path d). Social functioning contributes to romantic functioning (path e), a link which is further supported by the low rate of romantic relationship experience consistently reported for people with ASD; this would also reduce opportunities to learn from such experiences (path f). Parental guidance appears to contribute to informal sexual health education however this appears to be small and indifferent between individuals with ASD and TD individuals (path g). Further, sex-related information is often gained from the internet (path h).

Regarding factors of formal sexual health education, the amount of concern for an individual appears to be heightened when that individual has ASD, as evidenced by the current meta-analysis (path i). While the amount of concern could be assumed to precipitate additional support being sought for formal sexual health education, this has not been specifically explored. The current meta-analysis evidenced less sexual health
education for individuals with ASD (path j). It is noted that most studies reviewed did not specify whether formal sexual health education was provided through school curriculum, support services, or otherwise. The role of support services in providing formal sexual health education appears relevant given that adequate sexual knowledge was reported in two adult-only samples with ASD (mean age of 35 years). Such findings suggest that sexual knowledge is being gained after schooling age, and given the aforementioned limits on social avenues for such learning, it is possible that support services contribute to formal sexual health education in adult years (path k).

The current review also highlighted some of the ways in which resulting socio-sexual functioning differs for individuals with ASD, likely due to the influence of previously mentioned factors (path L). As such, more inappropriate sexual behavior was supported by the current meta-analysis. Further, existing literature suggests greater rates of experiencing unwanted sexual contact and a difference in the amount of sexual experience—however findings in the latter are inconsistent. These factors each require further exploration, as some may also function as factors relevant to informal and formal sex-related education. While hypothesized associations with ASD were confirmed, no studies sought to identify which specific characteristics of ASD were at play. Thus, such associations in the proposed model remain assumed.

This review suggests that the pathways to developing socio-sexual wellbeing are different for individuals with ASD due to the factors reviewed. Having fewer opportunities for appropriate informal and formal sexual health education leaves them at a double disadvantage from others who are receiving such information from both of these avenues. However, the current findings are limited by some results having a high degree of extraneous variance, a small (albeit growing) literature base, a lack of specific characteristics of ASD.
of TD control group comparisons, non-representative male-to-female gender ratios, and use of samples with a wide age range but no analyses which control for such.

Further possible limitations include the use of self-report data, which may have been restricted by participant’s limited insight [Kaur, 2009]. However, alternate parent-report is also limited, in this case by being based on only observable behaviors, assumptions, or second-hand information. Irrespective of who completes the questionnaires, a clear definition of what constitutes inappropriate behavior is vital, however was not evident in most of the reviewed studies. Although this is no easy feat, future research should endeavor to clarify exactly what constitutes the type of sexual behavior being measured in the study.

Participants in this study’s meta-analyses ranged widely from 10 to 36 years of age, which may hide age-related effects in the data. The importance of this is highlighted by findings that social behavior increases with age for people with ASD but mildly decreases for TD individuals [Stokes & Kaur, 2005] thus lifespan data are needed with appropriate control of age. Research into what qualities individuals find attractive, and how they are related to success, failure, and general functioning of courting and relationships, is needed. Further, it is important to note that modern research is finding higher levels of sexual and gender diversity for individuals on the autism spectrum [Fernandes et al., 2016; George & Stokes, 2016; Van Der Miesen, Hurley, & De Vries, 2016]. Thus, less heteronormative and cis-normative research will start to emerge, of which the current model should adapt to.

It is noted that four of the studies in this review utilized a version of the SBS as its primary measurement tool. This scale has various utilities however also a number of limitations including no assessment of unidimensionality of the scale and only moderate reliability of some sub-scales. The SBS has a narrow scope of assessing socio-sexual functioning and does not explore common positive sexual behaviors. Finally, the lack of focus on identifying which characteristics of ASD are associated with each factor of socio-sexual wellbeing is particularly problematic given the heterogeneity within ASD.

Conclusion

Research to date has identified various relevant factors in socio-sexual functioning. The current review has summarized, meta-analyzed, and conceptualized the most prominent of such factors. This has increased understanding of how these factors can mediate the association between individuals with ASD and socio-sexual wellbeing. While there can be other biological factors at play, such a developmental focus was beyond the scope of this paper. The small number of studies available for meta-analysis limits the generalizability of findings to other populations. Further, a larger evidence base would increase the validity of the current results. Confirmation and extension of the findings, as discussed, is necessary if such issues experienced by those with ASD are to be addressed through tailored and supportive interventions.

The current review has found differences in aspects of socio-sexual functioning, between some individuals with ASD when compared to individuals without such diagnosis. Unfortunately, such variation is characterized by a range of increased difficulties which are more commonly experienced by individuals with ASD. Such difficulties relate to social interactions, relationship experience, adherence to privacy norms, appropriate sexual behaviors, and receipt of sex-related education; as reviewed herein. These differences and difficulties can lead to poorer future outcomes, as consistent with the greater level of concern expressed about the future of individuals with ASD. Therefore, as a society which values wellbeing and equality for all, regardless of developmental differences, supports are needed to assist individuals with ASD to achieve the fulfilment and life satisfaction that others more readily attain.

References


