Brief report

Health anxiety in autistic adults

John Galvin [a,b,*], Gareth Richards [a,b]

[a] *Department of Psychology, University of Warwick, UK*
[b] *School of Psychology, Newcastle University, UK*

A B S T R A C T

Background: Health anxiety involves misinterpreting normal bodily sensations as symptoms of a serious illness. No study to date has explored health anxiety in autistic adults. This cross-sectional study had three aims: 1) to examine the levels of health anxiety in autistic and non-autistic adults, 2) to explore sex differences in health anxiety across both subsamples, and 3) to determine whether autistic traits were associated with health anxiety in either or both subsamples.
Method: A cross-sectional self-report questionnaire measuring demographic information (sex, age, ethnicity), diagnostic information, comorbid diagnoses, autistic traits, and health anxiety was distributed to 110 autistic and 110 non-autistic adults without intellectual disability.
Results: The findings showed health anxiety to be significantly higher in autistic than non-autistic adults, and significantly higher in females than males in both subsamples. Almost 1 in 3 autistic people reported clinically significant levels of health anxiety. Positive correlations were found between autistic traits and health anxiety in both autistic and non-autistic subsamples, and these relationships remained statistically significantly after controlling for covariates.
Conclusions: This is the first study to investigate health anxiety in a sample of autistic people, and also the first to consider the relationship between autistic traits and health anxiety in both autistic and non-autistic individuals. The findings have both clinical and research implications.

1. Introduction

Health anxiety refers to an obsessive and irrational worry about having a serious health condition (Salkovskis et al., 2002). Individuals experiencing health anxiety are often pre-occupied and hyperaware of bodily sensations, frequently misinterpreting normal sensations as symptoms of serious illness. People at the extreme end of the continuum may receive a diagnosis of hypochondriasis, a condition in which health anxiety is experienced as chronic and disabling (Kosic et al., 2020). As well as causing difficulties at a personal level, health anxiety can incur a heavy economic cost due to frequent and unnecessary contact with healthcare services (Hedman et al., 2013). Health anxiety is typically reported at higher rates in females compared to males in the general population (Goodwin et al., 2013).

Autism Spectrum Disorder (ASD) is characterised by social and communication difficulties and restrictive/repetitive behaviours (American Psychiatric Association, 2013). Co-occurring conditions such as generalised anxiety and depressive disorders, attention-deficit-hyperactivity-disorder (ADHD), and obsessive-compulsive disorder (OCD) are frequently reported (Bedford et al., 2020; Hollocks et al., 2019). The consensus that autism represents one end of a continuum has generated an interest in autistic traits, a set of primary symptoms associated with autism which are continuously distributed throughout the general population (Ruzich et al.,

2015).

Autism is diagnosed in approximately 1 % of the UK population (Baron-Cohen et al., 2009), with approximately three times as many males as females receiving a diagnosis (Zablotsky et al., 2015). This sex difference likely reflects a combination of biological and social processes, and may be inflated by a sex-specific stereotype in how autism is measured and diagnosed (Jamison et al., 2017). As more information on the female autism phenotype emerges (Young et al., 2018), research on sex differences can provide greater clarity on patterns of risk for co-occurring conditions (Mandy, 2017). Emerging evidence suggests that autistic females may experience higher rates of co-morbidities and have an increased risk of mental health problems than autistic males (Rydzewska et al., 2018; Sedgewick et al., 2021).

Although no empirical research to date has examined health anxiety in autistic people, it is possible that some of the main characteristics of autism can exacerbate health anxiety symptoms. For instance, restricted attention, hyper-attention to detail, repetitive behaviours and sensory hypersensitivity in autistic people could lead to elevated vigilance towards bodily sensations, greater checking of the body, more misinterpretation of symptoms, and increased symptomatology. Considering the social and communication difficulties that are characteristic of autism, it is possible that health anxiety may exacerbate these difficulties and contribute to social withdrawal. Similar to autism, health anxiety frequently co-occurs with other mental health conditions such as obsessive compulsive disorder (OCD) (Hedman et al., 2017), panic disorder (Abramowitz et al., 2007), and depression (Uçar et al., 2015).

The focus of the current study was (1) to investigate health anxiety in a sample of autistic and non-autistic adults without intellectual disabilities to determine whether levels of health anxiety differed between groups, (2) to explore whether sex differences in health anxiety reported in general populations (females > males) extended to autistic populations, and (3) to determine whether autistic traits are associated with health anxiety in both autistic and non-autistic subsamples. We predicted that health anxiety would be higher in autistic compared to non-autistic participants, that females would report higher health anxiety than males in both groups, and that autistic traits would be positively correlated with health anxiety in both groups.

2. Method

Ethical approval was granted by the Faculty (approval number: 9626/sub1/AM/2021/Oct/BLSS). All participants provided informed consent before taking part in the study.

Table 1
Participant characteristics in the autistic and non-autistic samples. *M* mean, *SD* standard deviation. Differences between autistic and non-autistic groups in co-occurring mental health conditions are analysed using Pearson's chi-square test of independence.

	Autistic adults	Non-autistic adults	
Sex *n*(%)	Male 55(50); Female 55(50)	Male 55(50); Female 55(50)	
Age in years *M, SD* (range)	33.51, 9.512 (18–58)	34.75, 11.384 (19–69)	
Ethnicity *n*(%)	White 100(91)	White 98 (89)	
	Asian / Asian British 4(3)	Asian / Asian British 9(8)	
	Black / Black British 2(2)	Black / Black British 2(2)	
	Hispanic or Latino 2(2)	Middle / Near Eastern 1(1)	
	Mixed: Black Caribbean and white British 2(2)		
Autism diagnosis *n*(%)	Yes 110(100)	Yes 0(0)	
	No, but I suspect that I have this condition 0(0)	No, but I suspect that I have this condition 0(0)	
	No 0(0)	No 110(100)	
Generalised anxiety diagnosis *n*(%)	Yes 77(70)	Yes 30(27)	$\chi^2(2, 220)= 48.895, p < 0.001$
	No, but I suspect that I have this condition 23(21)	No, but I suspect that I have this condition 29(26)	
	No 10(9)	No 51(47)	
Depression diagnosis	Yes 73(66)	Yes 28(25)	$\chi^2(2, 220)= 50.526, p < 0.001$
	No, but I suspect that I have this condition 20(18)	No, but I suspect that I have this condition 15(14)	
	No 17(16)	No 67(61)	
Obsessive Compulsive Disorder (OCD) diagnosis	Yes 13(12)	Yes 2(2)	$\chi^2(2, 220)= 20.654, p < 0.001$
	No, but I suspect that I have this condition 31(28)	No, but I suspect that I have this condition 13(12)	
	No 66(60)	No 95(86)	
Attention Deficit Hyperactivity Disorder (ADHD)	Yes 21(19)	Yes 2(2)	$\chi^2(2, 220)= 48.895, p < 0.001$
	No, but I suspect that I have this condition 35(32)	No, but I suspect that I have this condition 14(13)	
	No 54(49)	No 94(85)	
Autistic traits (AQ total score) *M, SD*	33.60, 7.576	20.31, 7.780	
Health anxiety (SHAI score) *M, SD*	22.78, 10.402	17.17, 9.254	
Generalised anxiety (HADS anxiety score) *M, SD*	12.71, 4.356	9.65, 4.701	

2.1. Participants

G*Power analysis determined the sample size. Based on a medium effect size for linear regression analysis with three predictors, 80 % power, and alpha set at $p < 0.05$ (two-tailed), a total of $N = 77$ participants was required. Participants were 110 autistic (55 female, 55 male) and 110 non-autistic (55 female, 55 male) adults without intellectual disability recruited from Prolific: www.prolific.co. Data were collected during January 2022. Participants were each paid £ 1.50. Sample characteristics are presented in Table 1.

Several steps were taken to increase confidence that participants met the study selection criteria. We used the Prolific pre-screen feature, which limits the pool of participants based on selected inclusion/exclusion criteria. The study was only advertised to individuals who met the following pre-defined selection criteria: For the diagnosed autistic group: autism diagnosis, sex (equal male/ female split) and geography (based in the UK). For the comparison group with no autism diagnosis: No autism diagnosis, known or suspected; and, as for the autism group, sex (equal male/female split) and geography (based in the UK).

As an additional step, we included a question at the beginning of the survey to confirm diagnostic status and to collect data on other relevant conditions. Specifically, participants were asked "Have you ever been diagnosed with any of the following conditions?" and were presented with the following list: autism, anxiety, depression, obsessive compulsive disorder, attention deficit hyperactivity disorder. Three response options were possible for each condition in the list "Yes", "No, but I suspect I have this condition", and "No, and I do not suspect I have this condition". If a participant that was pre-screened into the autistic sample responded to the autism item with "No, but I suspect I have this condition" or "No, and I do not suspect that I have this condition" then they were re-directed to the end of the survey as they did not meet the inclusion criteria. Likewise, participants in the non-autistic group who responded with 'Yes' or 'No, but I suspect I have this condition' were also redirected to the end of the survey as they did not meet the inclusion criteria.

Although in general the Prolific pre-selection feature was consistent with the self-reported characteristics of the participants, on a small number of occasions there were inconsistencies. Specifically, five participants in the non-autistic sample reported that they had a diagnosis of autism, and four participants in the autistic sample reported not having an autism diagnosis. The data from these participants were removed and additional participants recruited as replacement to ensure the final target sample size was reached. Furthermore, four participants ($n = 3$ autistic, $n = 1$ non-autistic) reported being non-binary and one autistic participant reported being transgender. As a focus of the study was on sex differences and the sample sizes in these groups were too small for meaningful comparisons to be made, we removed these data and recruited additional participants as replacements. All participants with data removed were still paid.

Although recent studies have shown that Prolific produces higher quality data than other participant recruitment panels (Peer et al., 2021; Stanton et al., 2022), it is known that there can be some low-quality responses on crowdsourcing platforms (Jones et al., 2022). For this reason, two attention control items were embedded in the survey to ensure participants were reading and engaging with the questions appropriately: "This item is to check you are paying attention, please answer with definitely disagree". Participants who failed the attention controls (total $N = 7$, $n = 1$ autistic, $n = 6$ non-autistic) were replaced and did not get paid. None of these participants contested this decision.

2.2. Materials

Participants reported their sex (male, female, prefer not to say, prefer to self-describe), age, ethnicity, and whether they were diagnosed with or suspected autism, anxiety, depression, OCD or ADHD. Autistic traits were measured with the Autism Spectrum Quotient (AQ; Baron-Cohen et al., 2001), a 50-item self-report questionnaire. Items are coded 0 or 1 and summed to provide an overall score between 0 and 50. Internal consistency (Cronbach's alpha) in the current study for AQ total score was $\alpha = 0.912$.

The Short Health Anxiety Inventory (SHAI; Salkovskis et al., 2002) is an 18-item questionnaire in which respondents rate their feelings about their health. Each item is scored from 0 to 3. Summing the responses provides an overall health anxiety score between 0 and 54. A cut-off score of ≥ 27 has been used to signify clinically significant health anxiety symptoms and has been identified as the most appropriate cut-off score to accurately differentiate between hypochondriasis and other anxiety disorders (Alberts et al., 2013). Sample items include "I spend most of the time worrying about my health" and "I usually feel at high risk for developing a serious illness". Internal consistency for the scale was high ($\alpha = 0.924$).

To account for generalised anxiety in the model, we administered the anxiety subscale from the Hospital Anxiety and Depression scale (HADS; Zigmond & Snaith, 1983). This is a 7-item subscale with a response scale from 0 to 3. Items are summed to provide an overall score between 0 and 21. Sample items include "I feel tense or wound up" and "I get sudden feelings of panic". Internal consistency for the scale was high ($\alpha = 0.856$).

2.3. Procedure and data analysis

An online self-report questionnaire hosted by Qualtrics was advertised on Prolific. Data were analysed using IBM SPSS version 28, with statistical significance set at $p < 0.05$. A series of chi-square tests of independence were performed to examine the relation between autism diagnostic status and co-occurring health conditions. To examine group differences for autistic traits and health anxiety, we conducted 2 (autistic or non-autistic) × 2 (male or female) factorial ANOVAs. Pearson's correlations were used to examine bivariate relationships, and two multiple linear regression analyses (controlling for sex and age) were used to examine whether autistic traits predicted health anxiety in the autistic and non-autistic samples separately. An additional linear regression model was used to explore whether autistic traits remained a significant predictor of health anxiety once HADS anxiety had been controlled for statistically.

3. Results

Table 1 shows that significantly more autistic than non-autistic participants reported receiving diagnoses for generalised anxiety, depression, ADHD, and OCD (all $ps < 0.001$). Based on the SHAI cut-off score of ≥ 27, $n = 37$ (30 %) in the autistic sample and $n = 10$ (8.8 %) in the non-autistic sample reported clinically significant levels of health anxiety. Group differences on autistic traits and health anxiety are illustrated with violin plots (Fig. 1). For autistic traits, the main effect for diagnosis was significant $F(1, 216) = 165.510$, $p < 0.001$, $\eta_p^2 = 0.434$, with higher autistic traits reported in the autistic compared to the non-autistic sample. No significant main effect was observed for sex $F(1, 216) = 1.229$, $p = 0.269$, $\eta_p^2 = 0.006$. The diagnosis × sex interaction term was also not significant $F(1, 216) = 1.742$, $p = 0.188$, $\eta_p^2 = 0.008$. For health anxiety, the main effect for diagnosis was significant $F(1, 216) = 19.041$, $p < 0.001$, $\eta_p^2 = 0.081$, with higher health anxiety reported in the autistic compared to the non-autistic sample. The main effect for sex was also significant $F(1, 216) = 16.422$, $p < 0.001$, $\eta_p^2 = 0.071$, with higher health anxiety reported in females compared to males. The diagnosis
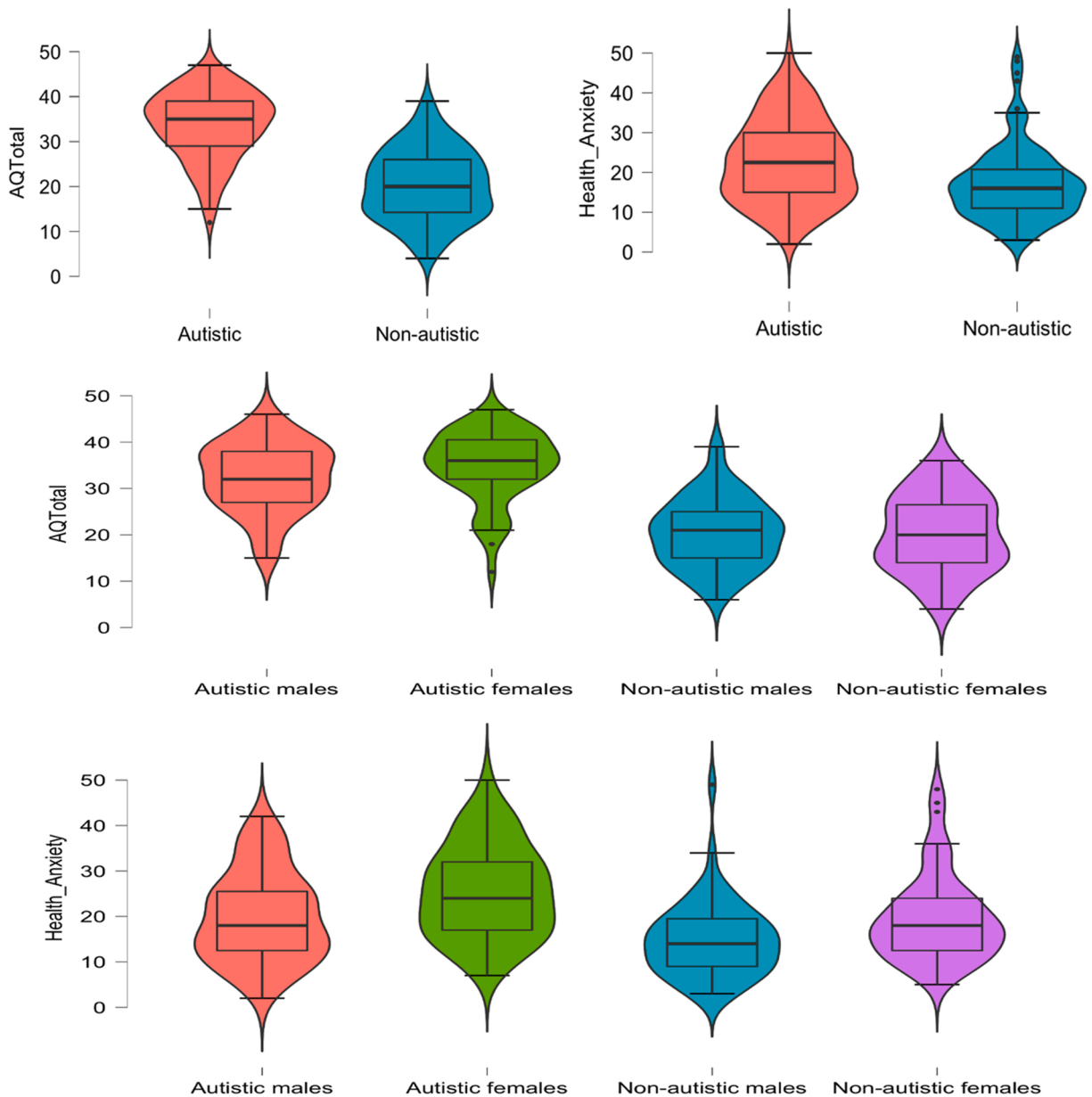

Fig. 1. Violin boxplots for AQ score and SHAI score. The top row presents the data stratified by diagnostic status and the second and third rows presents the data stratified by both diagnostic status and sex. *AQ = Autism Spectrum Quotient.*

$\times$ sex interaction was not significant $F(1, 216)= 0.076$, $p = 0.783$, $\eta_p^2 < 0.001$.

Pearson's correlation analyses showed autistic traits were significantly positively correlated with health anxiety in the autistic ($r = 0.234$, $p = 0.014$) and non-autistic ($r = 0.239$, $p = 0.012$) samples. Two separate multiple linear regression analyses (one including autistic participants, the other including non-autistic participants) were then conducted. Both models were significant and explained ~12 % of variance in health anxiety scores (autistic: $F[3106]=4.616$, $p = 0.004$, adjusted $R^2 =0.116$; non-autistic: $F[3106]= 5.194$, $p = 0.002$, adjusted $R^2 =0.128$). In each case, higher AQ score and sex (female) were significant predictors of greater health anxiety (Table 2).

In the final regression model, we considered whether the observed relationship between autistic traits and health anxiety would remain significant when HADS anxiety was included as a covariate. This model explained 41.8 % of variance in health anxiety scores F $[4215] = 40.288$, $p < 0.001$, adjusted $R^2 = 0.418$, and AQ was found to remain a significant predictor (Table 3).

All regression models showed no evidence of multicollinearity (all tolerance >0.50; all VIF <2), error was independent between predictors (Durbin-Watson ~2), data were broadly homoscedastic, and residuals were normally distributed.

4. Discussion

This is the first study to examine health anxiety in a sample of autistic people, and the first to consider the correlation between autistic traits and health anxiety in autistic or non-autistic samples. Autistic participants reported significantly higher levels of health anxiety than non-autistic participants, and, notably, autistic females reported higher levels than all other groups (i.e., autistic males, non-autistic males, and non-autistic females). Furthermore, autistic traits were positively correlated with health anxiety in both subsamples, and these effects remained significant after controlling for covariates.

The finding that autistic traits are positively correlated with health anxiety in autistic and non-autistic populations builds on previous literature showing that cognitions (Hadjistavropoulos et al., 2012), personality (Sanatinia et al., 2016), and socio-developmental factors (Wright et al., 2017) may be implicated in health anxiety and associated mental health outcomes. One clinically relevant interpretation of our findings is that the severity of autistic features could make health anxiety more severe in autistic and non-autistic people. Although longitudinal analyses are necessary before causation can be inferred, our findings suggest that clinicians may consider autistic traits in the assessment and treatment planning for patients experiencing health anxiety/hypochondria. This might be particularly relevant in the case of females, who might be more likely to camouflage or hide their autistic traits (Hull et al., 2020) and who generally report higher rates of health anxiety (Goodwin et al., 2013).

Although the current study was not focused on the COVID-19 pandemic per se, the context of the pandemic is clearly of relevance due to the timing of data collection. Research conducted during the pandemic showed autistic people reported changes in their sensory experiences and increased feelings of vulnerability (Bundy et al., 2021; Mosquera et al., 2021). As there are no pre-COVID-19 data available on levels of health anxiety in autistic people, it is difficult to determine whether the finding that autistic people reported significantly higher levels of health anxiety than non-autistic adults is a consequence of their pandemic experiences as a clinically vulnerable group. Regardless, the finding that 30 % of autistic participants met the cut-off for clinically relevant levels of health anxiety compared to 8.8 % of non-autistic participants suggests health anxiety/hypochondria may currently be an important issue affecting the mental health of autistic people.

Although the proportion of participants that reported a diagnosis of OCD or ADHD in the current study is comparable to previous estimates (Lai et al., 2019), more participants than expected reported generalised anxiety and/or depression diagnoses in both the autistic and non-autistic samples. As previously noted, this could be due to the timing of data collection, which occurred just after UK lockdown restrictions were discontinued. For instance, increased prevalence of anxiety and depressive disorders were reported in the UK general population since the onset of the pandemic (for a review, see (Dettmann, Adams, & Taylor, 2022) as well as in samples of autistic people (Oomen, Nijhof, & Wiersema, 2021). The findings of the current study should therefore be considered within this context, and highlights the need for future studies on the prevalence of health anxiety in autistic adults.

Our findings should be considered in light of several other limitations and future considerations. First, the higher rates of health

Table 2

Multiple linear regression models in autistic and non-autistic samples with autistic traits as predictor, health anxiety as outcome, and sex and age as covariates. AQ = Autism Spectrum Quotient; B = unstandardized beta coefficient; 95 % CI = 95 % confidence intervals; β = standardized beta coefficient; t = t value; p = p value.

	Unstandardized coefficients			Standardized coefficients		
	B	95 % CI	SE	β	t	p
Autistic sample:						
Constant	22.918	11.080, 34.756	5.971		3.838	< 0.001
AQ total score	0.290	0.033, 0.547	0.130	0.211	2.235	0.033
Sex (female)	4.820	1.013, 8.627	1.920	0.233	2.510	0.014
Age	-0.090	-0.292, 0.112	0.102	-0.082	-0.880	0.381
Non-autistic sample:						
Constant	18.742	10.033, 27.451	4.393		4.267	< 0.001
AQ total score	0.288	0.072, 0.504	0.109	0.242	2.648	0.009
Sex (female)	4.916	1.601, 8.232	1.672	0.267	2.940	0.004
Age	-0.001	-0.149, 0.146	0.074	-0.002	-0.017	0.987

Table 3

Multiple linear regression model with autistic traits as predictor, health anxiety as outcome, and sex, age and HADS anxiety as covariates. AQ = Autism Spectrum Quotient; HADS = Hospital Anxiety and Depression Scale; B = unstandardized beta coefficient; 95 % CI = 95 % confidence intervals; β = standardized beta coefficient; t = t value; p = p value.

	Unstandardized coefficients			Standardized coefficients		
	B	*95 % CI*	*SE*	*β*	*t*	*p*
Constant	5.318	-1.032, 11.668	3.222		1.651	0.100
AQ total score	0.122	0.012, 0.216	0.058	0.121	2.461	0.011
Sex (female)	-1.282	-3.479, 0.915	1.115	-0.063	-1.150	0.251
Age	-0.003	-0.101, 0.095	0.050	-0.003	-0.065	0.948
HADS anxiety	1.247	0.992, 1.502	0.130	0.583	9.630	< 0.001

anxiety reported by the autistic sample might reflect, to some extent at least, an actual increased rate of comorbid health issues within this group. Further research is required to examine other co-occurring conditions relevant to ASD and health anxiety. To explore the health anxiety experiences of autistic people in more detail, a qualitative or mixed method study might be particularly useful. Second, although the SHAI has been used previously as a screening tool for health anxiety in both clinical and non-clinical samples (e.g., Alberts et al., 2013), we cannot be sure it is a robust measure of health anxiety in autistic people. Future research may consider whether the SHAI needs adjustment for use in autistic populations. Third, the sample was drawn form an online recruitment platform and therefore may not be representative. Specifically, the study compared people with a self-reported diagnosis of autism with a group of individuals that did not self-report a diagnosis of autism. The conclusions drawn from the study may therefore not apply to individuals who suspect they are autistic or who identify as autistic but have had no formal diagnosis. Finally, the exclusion of individuals with an intellectual disability limits the generalisability of the findings to the full spectrum of intellectual functioning. Future research could therefore recruit samples that are more diverse in this regard.

5. Implications

This is the first study to investigate health anxiety in relation to ASD. Since autistic adults report experiencing co-occurring mental health conditions more commonly than non-autistic adults, there is a need to explore a greater range of mental health experiences in this population. Although preliminary, our findings suggest health anxiety might be an important issue for around 1 in 3 autistic people. The observed positive correlations between autistic traits and health anxiety suggest that clinicians may wish to consider autistic traits in the early stages of assessment and treatment planning for patients with and without an autism diagnosis who are experiencing health anxiety/hypochondria.

Declaration of Competing Interest

The authors report no declarations of interest.

Data Availability

Data will be made available on request.

Acknowledgements

References

Abramowitz, J. S., Deacon, B. J., & Valentier, D. P. (2007). The short health anxiety inventory: Psychometric properties and construct validity in a non-clinical sample. *Cognitive Therapy Research, 31*(6), 871–883. https://doi.org/10.1007/s10608-006-9058-1

Alberts, N. M., Hadjistavropoulos, H. D., Jones, S. L., & Sharpe, D. (2013). The short health anxiety inventory: A systematic review and meta-analysis. *Journal of Anxiety Disorders, 27*(1), 68–78. https://doi.org/10.1016/j.janxdis.2012.10.009

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th edition). https://doi.org/10.1176/appi.books.9780890425596.

Baron-Cohen, S., Scott, F. J., Allison, C., Williams, J., Bolton, P., Matthews, F. E., & Brayne, C. (2009). Prevalence of autism-spectrum conditions: UK school-based population study. *British Journal of Psychiatry, 194*(6), 500–509. https://doi.org/10.1192/bjp.bp.108.059345

Baron-Cohen, S., Wheelwright, S., Skinner, R., Martin, J., & Clubley, E. (2001). The Autism-Spectrum Quotient (AQ): Evidence from Asperger syndrome/high-functioning autism, males and females, scientists and mathematicians. *Journal of Autism and Developmental Disorders, 31*(1), 5–17. https://doi.org/10.1023/a:1005653411471

Bedford, S. A., Hunsche, M. C., & Kerns, C. M. (2020). Co-occurrence, assessment and treatment of obsessive compulsive disorder in children and adults with autism spectrum disorder. *Current Psychiatry Reports, 22*(10), 1–11. https://doi.org/10.1007/s11920-020-01176-x

Bundy, R., Mandy, W., Crane, L., Belcher, H., Bourne, L., Brede, J., & Cook, J. (2021). The impact of early stages of COVID-19 on the mental health of autistic adults in the United Kingdom: A longitudinal mixed-methods study. *Autism*, 13623613211065543. https://doi.org/10.1177%2F13623613211065543.

Dettmann, L. M., Adams, S., & Taylor, G. (2022). Investigating the prevalence of anxiety and depression during the first COVID-19 lockdown in the United Kingdom: Systematic review and meta-analyses. *British Journal of Clinical Psychology, 61*(3), 757–780. https://doi.org/10.1111/bjc.12360

Goodwin, L., Fairclough, S. H., & Poole, H. M. (2013). A cognitive–perceptual model of symptom perception in males and females: The roles of negative affect, selective attention, health anxiety and psychological job demands. *Journal of Health Psychology, 18*(6), 848–857. https://doi.org/10.1177%2F1359105312456321.

Hadjistavropoulos, H. D., Janzen, J. A., Kehler, M. D., Leclerc, J. A., Sharpe, D., & Bourgault-Fagnou, M. D. (2012). Core cognitions related to health anxiety in self-reported medical and non-medical samples. *Journal of Behavioral Medicine, 35*(2), 167–178. https://doi.org/10.1007/s10865-011-9339-3

Hedman, E., Andersson, E., Lindefors, N., Andersson, G., Rück, C., & Ljótsson, B. (2013). Cost-effectiveness and long-term effectiveness of internet-based cognitive behaviour therapy for severe health anxiety. *Psychological Medicine, 43*(2), 363–374. https://doi.org/10.1017/S0033291712001079

Hedman, E., Ljótsson, B., Axelsson, E., Andersson, G., Rück, C., & Andersson, E. (2017). Health anxiety in obsessive compulsive disorder and obsessive compulsive symptoms in severe health anxiety: An investigation of symptom profiles. *Journal of Anxiety Disorders, 45*(1), 80–86. https://doi.org/10.1016/j.janxdis.2016.11.007

Hollocks, M. J., Lerh, J. W., Magiati, I., Meiser-Stedman, R., & Brugha, T. S. (2019). Anxiety and depression in adults with autism spectrum disorder: A systematic review and meta-analysis. *Psychological Medicine, 49*(4), 559–572. https://doi.org/10.1017/s0033291718002283

Hull, L., Petrides, K. V., & Mandy, W. (2020). The female autism phenotype and camouflaging: A narrative review. *Review Journal of Autism and Developmental Disorders, 7*(4), 306–317. https://doi.org/10.1007/s40489-020-00197-9

Jamison, R., Bishop, S. L., Huerta, M., & Halladay, A. K. (2017). The clinician perspective on sex differences in autism spectrum disorders. *Autism, 21*(6), 772–784. https://doi.org/10.1177/1362361316681481

Jones, A., Earnest, J., Adam, M., Clarke, R., Yates, J., & Pennington, C. R. (2022). Careless responding in crowdsourced alcohol research: A systematic review and meta-analysis of practices and prevalence. *Experimental and Clinical Psychopharmacology Advance Online Publication.* https://doi.org/10.1037/pha0000546

Kosic, A., Lindholm, P., Järvholm, K., Hedman-Lagerlöf, E., & Axelsson, E. (2020). Three decades of increase in health anxiety: Systematic review and meta-analysis of birth cohort changes in university student samples from 1985 to 2017. *Journal of Anxiety Disorders, 71*(1), Article 102208. https://doi.org/10.1016/j.janxdis.2020.102208

Lai, M. C., Kassee, C., Besney, R., Bonato, S., Hull, L., Mandy, W., … Ameis, S. H. (2019). Prevalence of co-occurring mental health diagnoses in the autism population: a systematic review and meta-analysis. *The Lancet Psychiatry, 6*(10), 819–829. https://doi.org/10.1016/S2215-0366(19)30289-5

Mandy, W. (2017). Autism spectrum disorder–An evolving construct. In D. Skuse, H. Bruce, & L. Dowdney (Eds.), *Child psychology and psychiatry: Frameworks for clinical training and practice* (pp. 197–202). Wiley Blackwell. https://doi.org/10.1002/9781119170235.ch23.

Mosquera, M. L., Mandy, W., Pavlopoulou, G., & Dimitriou, D. (2021). Autistic adults' personal experiences of navigating a social world prior to and during COVID-19 lockdown in spain. *Research in Developmental Disabilities, 117*, Article 104057. https://doi.org/10.1016/j.ridd.2021.104057

Peer, E., Rothschild, D.M., Evernden, Z., Gordon, A., & Damer, E. Data quality of platforms and panels for online behavioral research. *Behavior Research Methods*, 1–20. https://doi.org/10.3758/s13428–021-01694–3.

Oomen, D., Nijhof, A. D., & Wiersema, J. R. (2021). The psychological impact of the COVID-19 pandemic on adults with autism: a survey study across three countries. *Molecular Autism, 12*, 1–21. https://doi.org/10.1186/s13229-021-00424-y

Ruzich, E., Allison, C., Smith, P., Watson, P., Auyeung, B., Ring, H., & Baron-Cohen, S. (2015). Measuring autistic traits in the general population: A systematic review of the Autism - Spectrum Quotient (AQ) in a nonclinical population sample of 6,900 typical adult males and females. *Molecular Autism, 6*, 2. https://doi.org/10.1186/2040-2392-6-2

Rydzewska, E., Hughes-McCormack, L. A., Gillberg, C., Henderson, A., MacIntyre, C., Rintoul, J., & Cooper, S. A. (2018). Prevalence of long-term health conditions in adults with autism: observational study of a whole country population. *BMJ Open, 8*(8), Article e023945. https://doi.org/10.1136/bmjopen-2018-023945

Salkovskis, P. M., Rimes, K. A., Warwick, H. M. C., & Clark, D. M. (2002). The health anxiety inventory: Development and validation of scales for the measurement of health anxiety and hypochondriasis. *Psychological Medicine, 32*(5), 843–853. https://doi.org/10.1017/s0033291702005822

Sanatinia, R., Wang, D., Tyrer, P., Tyrer, H., Crawford, M., Cooper, S., & Barrett, B. (2016). Impact of personality status on the outcomes and cost of cognitive–behavioural therapy for health anxiety. *The British Journal of Psychiatry, 209*(3), 244–250. https://doi.org/10.1192/bjp.bp.115.173526

Sedgewick, F., Leppanen, J., & Tchanturia, K. (2021). Gender differences in mental health prevalence in autism. *Advances in Autism, 7*(3), 208–224. https://doi.org/10.1108/AIA-01-2020-0007

Stanton, K., Carpenter, R. W., Nance, M., Sturgeon, T., & Villalongo Andino, M. (2022). A multisample demonstration of using the prolific platform for repeated assessment and psychometric substance use research. *Experimental and Clinical Psychopharmacology Advance Online Publication.* https://doi.org/10.1037/pha0000545

Uçar, M., Sarp, Ü., Karaaslan, Ö., Gül, A. I., Tanik, N., & Arik, H. O. (2015). Health anxiety and depression in patients with fibromyalgia syndrome. *Journal of International Medical Research, 43*(5), 679–685. https://doi.org/10.1177/0300060515587578

Wright, K. D., Reiser, S. J., & Delparte, C. A. (2017). The relationship between childhood health anxiety, parent health anxiety, and associated constructs. *Journal of Health Psychology, 22*(5), 617–626. https://doi.org/10.1177/1359105315610669

Young, H., Oreve, M.-J., & Speranza, M. (2018). Clinical characteristics and problems diagnosing autism spectrum disorder in girls. *Archives Déleĺott Pédiatrie, 25*(6), 399–403. https://doi.org/10.1016/j.arcped.2018.06.008

Zablotsky, B., Black, L. I., Maenner, M. J., Schieve, L. A., & Blumberg, S. J. (2015). Estimated prevalence of autism and other developmental disabilities following questionnaire changes in the 2014 National Health Interview Survey. *National Health Statistics Report, 13*(87), 1–20.

Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica, 67*(6), 361–370. https://doi.org/10.1111/j.1600-0447.1983.tb09716.x