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Posttraumatic Stress Disorder in Autistic Adults: Correlates of Meeting DSM-5 Criteria and Predictors of Professional Diagnosis

Katherine E. Reuben
Georgia State University

ABSTRACT

POSTTRAUMATIC STRESS DISORDER IN AUTISTIC ADULTS: CORRELATES OF MEETING *DSM-5* CRITERIA AND PREDICTORS OF PROFESSIONAL DIAGNOSIS

By

KATHERINE ELAINE REUBEN

NOVEMBER 30, 2021

Objective: Although many autistic adults show high symptoms of posttraumatic stress, posttraumatic stress disorder (PTSD) is underdiagnosed in this population. This study aimed to examine correlates of autistic adults meeting PTSD criteria (PTSD+) as well as predictors of professional PTSD diagnosis (Diagnosis+) in the PTSD+ subgroup. *Method*: 677 self-identified autistic adults completed an online survey on their demographics, mental health symptoms, and trauma history. T-tests and chi-square were used to compare subgroups, and logistic regression was used to predict diagnosis status. *Results*: PTSD+ participants were less likely to be employed or identify as cisgender men; had more mental health symptoms and worse functional impairment; and had experienced a higher number of traumas and more interpersonal trauma. The same was true for Diagnosis+ participants, who were additionally older and more likely to be racial/ethnic minorities. Older age, being a woman or gender minority, being unemployed or on disability, increased posttraumatic stress, having more co-occurring conditions, lower anxiety, and lower functional impairment predicted being Diagnosis+ among participants who were PTSD+. The final model explained 35% of variance in diagnosis. *Conclusion*: PTSD is associated with significant impairment in autistic adults, but it often goes unrecognized. Autistic cisgender men in particular may be underdiagnosed with PTSD because of gendered stereotypes. High anxiety and functional impairment may also increase barriers to obtaining an appropriate diagnosis. Future research should include participant treatment history as a potential factor. Clinicians should be aware of these potential signs of PTSD and diagnostic barriers when working with autistic clients.

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KATHERINE ELAINE REUBEN

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30303

APPROVAL PAGE

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KATHERINE ELAINE REUBEN

Approved:

Dr. Shannon Self-Brown
Committee Chair

Dr. Erin Rachel Vinoski Thomas
Committee Member

November 30, 2021
Date

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Author's Statement Page

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Katherine Reuben

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Autism is associated with an increased risk of experiencing trauma, especially interpersonal trauma (IPT). Of particular concern is increased rates of child maltreatment (Baladerian, Coleman, & Stream, 2013; Gotby, Lichtenstein, Langstrom, & Pettersson, 2018; Dinkler, et al., 2017; Hellstrom, 2019; McDonnell, et al., 2019; Pfeffer, 2016; Mandell, Walrath, Manteuffel, Sgro, & Pinto-Martin, 2005; Chan, Lo, & Ip, 2018; Weiss & Fardella, 2018; Kildahl, Bakken, Iversen, & Helverschou, 2019; Hall-Lande, Hewitt, Mishra, Piescher, & LaLiberte, 2015) and bullying of autistic children (Baladerian, Coleman, & Stream, 2013; Hellstrom, 2019; Chan, Lo,, & Ip, 2018; Weiss & Fardella, 2018; Schroeder, Cappadocia, Bebko, Pepler, & Weiss, 2014; Maïano, Normand, Salvas, Moullec, & Aimé, 2016; Paul, Gallot, Lelouche, Bouvard, & Amestoy, 2018; Rose, Simpson, & Moss, 2015; Kildahl, Bakken, Iversen, & Helverschou, 2019). Autistic adults also report higher lifetime and adulthood traumatic experiences than non-autistic adults (Reuben, Stanzione, & Singleton, 2021; Brown-Lavoie, Viecili, & Weiss, 2014; Haruvi-Lamdan, Horesh, Zohar, Kraus, & Golan, 2020).

Some studies suggest that because of the relatively high rates of lifetime trauma and potentially unique mental health vulnerabilities experienced by autistic adults, this population is at increased risk for posttraumatic stress symptoms (Reuben, Stanzione, & Singleton, 2021; Paul, Gallot, Lelouche, Bouvard, & Amestoy, 2018; Haruvi-Lamdan, Horesh, Zohar, Kraus, & Golan, 2020; Mehtar & Mukaddes, 2011; Rumball, Happé, & Grey, 2020). However, findings have been mixed (see Brenner, Pan, Mazefsky, Smith, & Gabriels, 2018, which relied on parent-report for autistic children), and research in this area is lacking. The majority of studies on co-occurring conditions for autism spectrum disorders (ASD) do not include posttraumatic stress disorder

(PTSD), which makes it difficult to understand the true prevalence of PTSD in this population (Kerns, Newschaffer, & Berkowitz, 2015; Kildahl, Bakken, Iversen, & Helverschou, 2019). Furthermore, little is known about what factors might increase the risk of posttraumatic stress in trauma-exposed autistic adults. Finally, high levels of posttraumatic stress do not always translate to a clinical diagnosis of PTSD even when full diagnostic criteria for this disorder are met, and even less is known about what might lead a particular trauma-exposed autistic adult to be professionally diagnosed with PTSD.

There is evidence that PTSD is often underdiagnosed in clinical settings. In studies of adults in both outpatient clinics and psychiatric emergency settings, 60% to over 95% of those meeting criteria for PTSD have no previous diagnosis (da Silva, et al., 2019; Ivanov, et al., 2012). Even and perhaps especially in severely mentally ill populations with high trauma exposure, both trauma history and PTSD are often overlooked (Cusack, Grubaugh, Knapp, & Frueh, 2006; Chessen, Comtois, & Landes, 2011; Mueser, et al., 1998). A similar diagnostic gap was found in a study of adults with intellectual disability, 32% of whom met criteria for ASD (Mevissen, Didden, de Jongh, & Korzilius, 2020). Potential explanations for this gap include: comorbid mental health symptoms masking posttraumatic stress or being seen as more important to address; clinicians failing to ask about or consider the impacts of trauma exposures, potentially due to fear of upsetting the individuals, a perceived inability to treat PTSD, or a lack of appropriate training; and individuals failing to report their traumatic experiences (da Silva, et al., 2019; Chessen, Comtois, & Landes, 2011; Mevissen, Didden, de Jongh, & Korzilius, 2020; Frueh, Cusack, Grubaugh, Sauvageot, & Wells, 2006).

Barriers to the recognition and treatment of PTSD may be especially likely for autistic individuals. Autism can interfere with one’s awareness of and ability to communicate about

internal states, which can make it harder for clinicians to recognize the presence of primarily internal symptoms such as posttraumatic intrusions, cognitions, and emotions. Even the recognition of trauma may be reliant on the individual having good verbal abilities. This is especially true for autistic youth, who may rely on caregivers to accurately report their experiences and symptoms. Additionally, autism can cause a variety of more widely recognizable symptoms which clinicians may be more inclined to notice and treat. In some cases, posttraumatic symptoms in autistic individuals may be erroneously attributed to solely autism, co-occurring intellectual disability, or another co-occurring mental health condition, a practice known as "diagnostic overshadowing" (Kerns, Newschaffer, & Berkowitz, 2015; Mevissen, Didden, de Jongh, & Korzilius, 2020; Brenner, Pan, Mazefsky, Smith, & Gabriels, 2018; Kildahl, Bakken, Iversen, & Helverschou, 2019). Finally, because knowledge of posttraumatic stress in autistic adults is so sparse, it may be overlooked in this population due to a failure for clinicians to consider it as an option.

There may be additional factors that make it less likely that specific autistic adults will receive a professional diagnosis of PTSD despite meeting the criteria. Individuals from marginalized demographic groups may less frequently engage with mental health care or be adequately assessed and treated. Of the studies examining trauma and posttraumatic stress in autistic adults, none specifically focus on gender minorities despite gender minorities having an increased risk of trauma exposure in the general population (Reuben, Stanzione, & Singleton, 2021), indicating that this may be a particularly neglected group. Autistic racial and ethnic minorities less often receive services (Jo, et al., 2015), and racial and ethnic minorities are also less likely to begin and remain in therapy for PTSD (McClendon, Dean, & Galovski, 2020). Socioeconomic status can also predict an ASD diagnosis (Durkin, et al., 2010), and the most

common barrier to accessing mental health treatment in the U.S. is an inability to afford it (Walker, Cummings, Hockenberry, & Druss, 2015). Even in countries with universal mental healthcare, individuals with less education or income are less likely to seek treatment due to a belief that they can or should manage their mental health themselves, a belief that treatment would not help, reluctance to ask for help, a lack of knowledge of how to access treatment, or competing responsibilities that make it difficult to make time for treatment (Steele, Dewa, & Lee, 2007).

Mental health and functioning could also predict PTSD diagnoses in autistic adults. "Diagnostic overshadowing" could reduce the likelihood of a PTSD diagnosis in autistic adults who have a higher number of co-occurring mental health disorders, more severe ASD symptoms, other severe mental health symptoms such as dissociation or anxiety, or worse functional impairment in daily life. Additionally, trauma history may be predictive. Clinicians may have different beliefs about what is severe enough to cause PTSD, and this may lead to autistic adults being less likely to be diagnosed if they report a lower number of traumas or no IPT.

A timely diagnosis of PTSD is important. If PTSD is not adequately treated, its course can become chronic and more severe, and comorbid mental health symptoms may also worsen. The likelihood of a substance misuse disorder increases, and individuals may also experience worse physical health (Chessen, Comtois, & Landes, 2011; da Silva, et al., 2019; Mueser, et al., 1998). Individuals with untreated PTSD may become isolated, engage in delinquent behaviors, or be at increased risk of revictimization (Mueser, et al., 1998; Mevissen, Didden, de Jongh, & Korzilius, 2020). Finally, untreated PTSD can be costly because of hospitalizations, use of expensive psychiatric services, and lost productivity (Cusack, Grubaugh, Knapp, & Frueh, 2006;

Chessen, Comtois, & Landes, 2011). For all of these reasons, it is important to improve recognition of PTSD in autistic adults, a vulnerable yet historically underserved population.

Present Study

This study had two aims.

Aim 1: To explore differences between participants who currently meet criteria for PTSD (PTSD+) versus those who do not currently meet criteria (PTSD-) and between those who were professionally diagnosed with PTSD (Diagnosis+) versus those who were not (Diagnosis-). The following differences were hypothesized:

1. Autistic adults belonging to a marginalized demographic (having a marginalized gender or racial/ethnic identity, having low education, or being neither employed nor in school) would have increased likelihood of being PTSD+ compared to PTSD- and Diagnosis+ compared to Diagnosis- but would be less likely to be PTSD+/Diagnosis+ than PTSD+/Diagnosis-.
2. Autistic adults reporting increased difficulties with autism symptoms, mental health, and daily life functioning would have increased likelihood of being PTSD+ compared to PTSD- and Diagnosis+ compared to Diagnosis- but would be less likely to be PTSD+/Diagnosis+ than PTSD+/Diagnosis-.
3. Autistic adults with a more complex trauma history (reporting more traumas and reporting IPT) would have increased likelihood of being PTSD+, Diagnosis+, and PTSD+/Diagnosis+.
4. Older autistic adults would be more likely to be Diagnosis+, but age was not expected to differ between those who did versus did not meet criteria for PTSD.

Aim 2: Examine the predictive ability of these demographic, mental health, life functioning, and complex trauma variables on the likelihood that an autistic adult who meets *DSM-5* criteria for PTSD will be Diagnosis+. This analysis was exploratory; no hypotheses were made about the relative weight of each potential factor. The primary research questions for this research aim are:

1. What demographic factors (age, gender, race/ethnicity, education, or employment) predict whether an autistic adult who is PTSD+ will be Diagnosis+?
2. What mental health factors (diagnosis status, posttraumatic stress severity, degree of autistic traits, number of co-occurring disorders, psychoform dissociation, somatoform dissociation, anxiety, or functional impairment) predict whether an autistic adult who is PTSD+ will be Diagnosis+?
3. What trauma history factors (number of traumas experienced or experiencing IPT) predict whether an autistic adult who is PTSD+ will be Diagnosis+?

Methods

Participants

Participants were 677 autistic adults who were recruited between May and August of 2018. Participants were recruited from online communities for autistic individuals, including forums for autistic adults (autism-centric subreddits, Wrong Planet, and Autism Forums) and organizations that are for, or work in partnership with, autistic adults (the Academic Autism Spectrum Partnership in Research and Education [AASPIRE] and the Autism Self Advocacy Network [ASAN]). The majority of participants reported a professional ASD diagnosis, and almost all participants – including all of those who were not yet professionally diagnosed with ASD – scored over 65 on the Ritvo Autism Asperger Diagnostic Scale – Revised (RAADS-R).

65 is a commonly used cutoff on the RAADS-R to identify autistic adults (Ritvo, et al., 2011). Additionally, each participant included in this study completed the PTSD Checklist for DSM-5 (PCL-5). 1,053 individuals consented to participate in the study, but 357 were excluded for not completing the RAADS-R and PCL-5, and 19 were excluded for invalid response patterns (e.g., long stretches of the same response or conflicting responses to items). In total, 677 individuals composed the final sample for the current study.

[Table 1]

Table 1 presents participant demographics. The majority were under age 30, non-Hispanic White, and completed at least high school. However, almost one-third were unemployed or could not work due to disability. Cisgender men and cisgender women each composed over one-third of the sample, but it is notable that 19% of participants identified as nonbinary (i.e., their gender did not fit a man/woman binary**).** At the time of the study, 44% of participants (*n*=297) met the criteria for PTSD on the *PCL-5* (Table 2), and 20% (*n*=134) reported a professional diagnosis of PTSD (Supplementary Table 1). The Institutional Review Board of the Georgia Institute of Technology approved this research.

Materials

Participants completed an online survey which contained the following sections: demographic questions; autism symptoms; dissociative symptoms; anxiety symptoms; daily life functioning; potentially traumatic events; and posttraumatic stress symptoms. The measures for somatoform dissociation, anxiety, and daily life functioning were counterbalanced. Participants did not know what measure they were completing. They were given only the acronym of each measure's name, its instructions, and the measure itself. This was done to minimize the risk of participants biasing their responses in order to comply with perceived study expectations.

Demographic questions

All questions in the demographic section presented a list of options, some of which were single-selection and some of which allowed for multiple sections. Single-selection questions regarded age, gender identity, highest completed form of education, and current employment status. Most of the original brackets were very precise, but responses were clustered into broader categories for reporting (see Table 1). The exception is gender, for which the categories were presented exactly as reported but with expanded descriptions (e.g., “trans men” was defined as identifying most closely as “trans man / FTM / trans masculine”).

Multiple-selection questions regarded race/ethnicity, professional mental health diagnoses, and suspected mental health diagnoses. The original race/ethnicity categories were: White; Black or African American; Native American, American Indian, First Nations, or otherwise Indigenous; Asian, Native Hawaiian, or Pacific Islander; Arab or Middle Eastern; Hispanic or Latino; or Other. Due to low frequency of selection for many of these options, categories were collapsed into White, Black, Hispanic, or Other for reporting and further collapsed into White compared to racial/ethnic minority for analyses.

Professional diagnoses were defined as diagnoses “for which a PROFESSIONAL (your therapist, psychiatrist, doctor, or another diagnostician) has officially diagnosed you, stated with certainty that you have, or put on your medical record.” Suspected diagnoses were defined as diagnoses “which you, a family member, a professional, or another individual reasonably suspects that you have but that has NOT been professionally diagnosed, that your treating professionals are NOT certain that you have, and that is NOT on your medical records.” These definitions were selected with ASD diagnoses in mind. The diagnostic process for autism may involve multiple steps, such as: the individual, their parents, or education professionals

suspecting that the individual has autism; one or more professionals agreeing that this diagnosis is likely; a referral to a specialist; and finally, an official diagnosis.

Autism: Ritvo Autism Asperger Diagnostic Scale – Revised (RAADS-R)

The Ritvo Autism Asperger Diagnostic Scale – Revised is an 80-item questionnaire that contains 64 questions about traits of ASD as well as 16 reverse scored questions that describe normative behaviors. It asks whether these apply to the individual now and applied to the individual in the past (3 points), only apply to the individual now (2 points), only applied to the individual when they were younger than 16 (1 point), or never applied to the individual (0 points). The RAADS-R has excellent sensitivity (97%) and specificity (100%) when using a cutoff score of 65 (Ritvo, et al., 2011).

Dissociation (psychoform): Multiscale Dissociation Inventory (MDI)

The Multiscale Dissociation Inventory is a 30-item questionnaire that asks how often participants experienced psychoform dissociative symptoms over the past month. Responses range from 1 (*never*) to 5 (*very often*). The MDI contains 6 scales that each score a different type of psychoform dissociation, 4 of which correspond to clinical diagnoses. The MDI has been normed and standardized on 444 trauma-exposed individuals and validated in clinical, community, and university samples (Briere, 2002; Briere, Weathers, & Runtz, 2005). In this study, Cronbach's alpha was .94 (.77-.91 for subscales).

Dissociation (somatoform): 20-item Somatoform Dissociation Questionnaire (SDQ-20)

The 20-item Somatoform Dissociation Questionnaire asks participants to select on a scale from 1 (*this applies to me NOT AT ALL*) to 5 (*this applies to me EXTREMELY*) how often they experienced somatoform dissociative symptoms within the past year (Nijenhuis, Spinhoven,

Dyck, Hart, & Vanderlinden, 1996). The SDQ-20 has good discriminant validity for dissociative disorders (Nijenhuis, 2010). Cronbach's alpha in this study was .88.

Anxiety: Generalized Anxiety Disorder 7 (GAD-7)

The Generalized Anxiety Disorder 7 asks how often participants have been bothered by anxiety symptoms over the last 2 weeks. Responses are on a scale from 0 (*not at all*) to 3 (*nearly every day*). When using a cutoff point of 10, the GAD-7 has good sensitivity (89%) and specificity (82%) (Spitzer, Kroenke, Williams, & Löwe, 2006). Cronbach's alpha in this study was .89.

Daily life functioning: Barkley Functional Impairment Scale (BFIS)

The Barkley Functional Impairment Scale asks participants how impaired they have been in 15 life domains during the past 6 months. Responses are on a scale from 0 (*not at all*) to 9 (*severe*). Scores for each domain are normed based on a sample of 1,200 individuals that is representative of the US population. The BFIS strongly correlates with other measures of functional impairment and with psychopathology (Barkley, 2011). Cronbach's alpha in this study was .91.

Trauma history: Life Events Checklist for DSM-5 (LEC-5)

The Life Events Checklist for DSM-5 contains 17 items that describe potentially traumatic events and asks whether participants have directly experienced or been exposed to each event (Weathers, et al., 2013). It is correlated with PTSD symptoms and trauma-specific measures of distress (Gray, Litz, Hsu, & Lombardo, 2004).

Posttraumatic stress: PTSD Checklist for DSM-5 (PCL-5)

The PTSD Checklist for DSM-5 contains 20 items and asks participants to rate how much posttraumatic symptoms have bothered them over the past month. Subscales pertain to DSM-5

PTSD criteria B (posttraumatic intrusions), C (avoidance of trauma reminders), D (negative alterations in mood and cognitions), and E (alterations in arousal and reactivity). Responses are on a scale from 0 (*not at all*) to 4 (*extremely*) (Weathers, et al., 2013). It has excellent convergent and discriminant validity among clinical populations and adequate convergent and discriminant validity among non-clinical populations (Blevins, Weathers, Davis, Witte, & Domino, 2015). Cronbach's alpha in this study was .95 (.89-.90 for criterion scales).

Design and Procedure

The Qualtrics survey began with a consent form which warned potential participants that the content of the survey pertained to mental health and trauma. Participants could progress through the survey at their own pace and had the option to exit the survey at any point in time. Exiting or completing the survey directed participants to a list of crisis hotlines and other mental health resources.

The researchers coded data as meeting criteria for a provisional PTSD diagnosis (PTSD+) if, on the PCL-5, participants scored at or above the severity cutoff of 33 and reported a sufficient number and intensity of symptoms from criteria B, C, D, and E. Professional and suspected diagnoses were self-reported by participants. We coded diagnosis status according to the presence of at least one professional mental health or neurodevelopmental disorder diagnosis. To determine the number of co-occurring disorders, we counted the number of professional and suspected diagnoses other than PTSD endorsed by each participant. We defined the degree of autistic traits as RAADS-R scores, psychoform dissociation as MDI scores, somatoform dissociation as SDQ-20 scores, anxiety as GAD-7 scores, and functional impairment as BFIS scores. From the LEC-5, we recorded the number of all traumas participants reported exposure to

and directly experiencing as well as IPT (defined as assault or unwanted sexual experiences) directly experienced.

Data Analysis

We performed t-tests and chi-square tests to compare all collected measures across participants meeting criteria for PTSD (PTSD+) versus not meeting criteria (PTSD-) and across participants professionally diagnosed with PTSD (Diagnosis+) versus not professionally diagnosed (Diagnosis-). We performed logistic regression to determine the individual and combined impact of potential predictive factors (demographics, mental health, and trauma history) on the likelihood that autistic adults who are PTSD+ will be Diagnosis+. We then performed chi-square to compare rates of PTSD diagnosis across gender groups, both for all participants of each gender and for the subset of each gender that was PTSD+. Missing data was determined to be missing completely at random, and pairwise deletion was used. For all statistics, the alpha value was .05.

Results

Subgroup Descriptive Statistics

When comparing the subgroup of autistic adults who were Diagnosis+ to those who were Diagnosis-, demographic differences emerged in age, race/ethnicity, vocation, and gender (Table 1). The autistic adults who were Diagnosis+ were older, more likely to be racial or ethnic minorities, more likely to be on or seeking disability, and less likely to be cisgender men. Differences in vocation and gender were also significant for autistic adults who were PTSD+ compared to PTSD-, although these differences were smaller than for PTSD diagnosis status.

On all measures of autism symptoms, mental health symptoms, and functional impairment, the autistic adults who were PTSD+ or Diagnosis+ scored significantly higher than

those who were PTSD- or Diagnosis- respectively (Table 2). However, the PTSD+ subgroup often had higher scores than the Diagnosis+ subgroup. Most notably, depending on the stringency of the *PCL-5* cutoffs used, only 74% to 83% of those who were Diagnosis+ met PTSD criteria at the time of the study. Many of these differences are reflected in the professional and suspected diagnoses rates within the full sample and each of these subgroups (Supplementary Table 1).

Trauma history was also significantly different across the groups (Table 3). Compared to those not in the subgroups, autistic adults who were PTSD+ or Diagnosis+ endorsed significantly more trauma exposure and direct experiences of traumas, and they reported higher rates of exposure to any IPT, physical assault, sexual assault, and other unwanted or uncomfortable sexual experiences. This increase was even more stark for the Diagnosis+ subsample. Most notably, 94% of this group reported having experienced IPT, with 80% reporting physical assault, 68% sexual assault, and 86% another unwanted or uncomfortable sexual experience.

Predictors of PTSD Diagnosis

When demographic information was entered into the logistic regression model (Table 4), being older than 21, being a cisgender woman or gender minority, being unemployed or on disability, and being from a racial or ethnic minority all significantly predicted being Diagnosis+ for autistic adults who were PTSD+. Highest level of education, being a student, or having an "other" employment status (such as being a homemaker or retired) were not significant predictors when controlling for other demographic factors.

When mental health information was added to the model, increased posttraumatic stress, having a higher number of co-occurring mental health or neurodevelopmental disorders, lower anxiety, and lower functional impairment all predicted being Diagnosis+. Having reported at

least one professional diagnosis other than PTSD, increased autistic traits, increased psychoform dissociation, and increased somatoform dissociation were not significant predictors when controlling for demographic and other mental health factors. Additionally, ethnic/racial minority status was no longer predictive after mental health information was added.

When information about traumatic experiences was added to the model, neither the number of traumas experienced nor a history of IPT predicted being Diagnosis+ when controlling for demographic, mental health, and other traumatic experiences factors. Additionally, being a trans woman compared to a cisgender man no longer predicted being Diagnosis+, although all other gender group differences remained significant. The total model explained 35% of variance in diagnosis.

Gender

Of the autistic adults who were PTSD+, cisgender men had the lowest proportion of professional PTSD diagnoses, 12% (Table 5). All other PTSD+ gender groups had professional diagnosis rates of 33% (transgender men) to 57% (transgender women). Cisgender men made up 35% of the study population (*n*=226) and 26% of those who were PTSD+ (*n*=74) and yet accounted for only 10% of those who were Diagnosis+ (*n*=13). Chi-square analyses of gender group differences in professional PTSD diagnosis was significant at $p < .0001$ for both the total sample and for the PTSD+ subgroup.

Discussion

Previous research with this dataset revealed a large gap between the percent of autistic adults who meet *PCL-5* criteria for PTSD (44%) and are professionally diagnosed with PTSD (20%) (Reuben, Stanzione, & Singleton, 2021). The purpose of this study was to examine correlates of autistic adults meeting PTSD criteria and having a professional diagnosis. Further,

predictors of having a professional diagnosis for autistic adults who meet criteria for PTSD were explored. The study hypotheses were partially supported.

Participants who were PTSD+ differed in several ways from those who were not. Those who were PTSD+ were less likely to be cisgender men, which may reflect an intrinsic difference in posttraumatic reactions or that cisgender men in this sample were less likely to experience sexual victimization than women or gender minorities (see Reuben, Stanzione, & Singleton, 2021). Additionally, those who were PTSD+ had different distributions of employment, with lower rates of employment and higher rates of being on or seeking disability assistance. This likely highlights the impact of PTSD on one's ability to obtain and keep employment, which can arise from the PTSD itself or from its impact in other domains. In this study, the PTSD+ subgroup scored higher on measures of autism symptoms, mental health symptoms, and functional impairment. Additionally, participants in this subgroup endorsed significantly more trauma exposure and direct experiences of traumas, and they reported higher rates of exposure to any IPT as well as all IPT subtypes.

Similar differences emerged for those who were Diagnosis+ compared to those who were not. Some but not all of these differences also predicted the presence of a professional diagnosis among the subgroup of autistic adults who were PTSD+. Those who were Diagnosis+ were significantly more likely to be older than 21 compared to both the full sample and the PTSD+/Diagnosis- subgroup, reflecting that older individuals have had more time in which they could have obtained a diagnosis. Those in the Diagnosis+ subgroup were also significantly more likely to be on or seeking disability benefits and less likely to be employed, and they were less likely to be cisgender men, showing unexpected exaggerations of the differences found across PTSD status. Contrary to expectations, the PTSD+/Diagnosis+ subgroup also had the highest

proportion of racial or ethnic minorities despite the lack of an underlying difference in rates of meeting criteria for PTSD. This may reflect that clinicians who are willing to diagnose ASD in racial/ethnic minorities are also more likely to recognize and diagnose PTSD, or it may reflect differences in professional expectations for autistic adults who are White compared to racial/ethnic minorities (e.g., perceptions that only autistic racial/ethnic minorities are vulnerable to trauma while White autistic adults are less vulnerable). More research is needed to make sense of this finding.

Participants who were Diagnosis+ scored higher on measures of autism symptoms, mental health symptoms, and functional impairment compared to those who were Diagnosis-. However, among those who were PTSD+, only increased posttraumatic stress and having a higher number of co-occurring disorders predicted being Diagnosis+. To the contrary, lower anxiety and lower functional impairment also predicted being Diagnosis+ in this subgroup, and other symptoms such as psychoform and somatoform dissociation did not significantly differ between the PTSD+/Diagnosis+ and PTSD+/Diagnosis- subgroups. One possible explanation for this finding is that when anxiety and functional impairment are high, PTSD+ individuals are less able to obtain trauma-informed mental health treatment in order to receive a professional PTSD diagnosis. High anxiety and functional impairment may make it difficult for autistic adults to understand how to or be comfortable seeking treatment. Additionally, clinicians may focus on the anxiety or functional impairment to the detriment of recognizing the presence of PTSD, may attribute anxiety and functional impairment to autism instead of exploring other underlying causes such as trauma history (“diagnostic overshadowing”), or may perceive these symptoms as reasons to avoid asking about trauma history for fear of further destabilizing the autistic adult (Kerns, Newschaffer, & Berkowitz, 2015; Mevissen, Didden, de Jongh, & Korzilius, 2020;

Brenner, Pan, Mazefsky, Smith, & Gabriels, 2018; Kildahl, Bakken, Iversen, & Helverschou, 2019).

Another possibility is that those who are Diagnosis+ are likely to have obtained their diagnosis in the context of mental health treatment, and this treatment may reduce some mental health symptoms – including anxiety and functional impairment – more quickly and effectively than others. More evidence for this possibility is that despite higher posttraumatic stress predicting a professional diagnosis in those who are PTSD+, 17% to 26% of those who were Diagnosis+ no longer met PTSD criteria by the time of the study. It may be that post-diagnosis treatment lowered posttraumatic stress below the *PCL-5* threshold for a minority of Diagnosis+ participants but was not sufficient to offset the trend of exceptionally severe posttraumatic stress in those who were PTSD+/Diagnosis+ at the time of the study. Future research should examine participant treatment history in order to evaluate these possibilities.

Another key finding is that Diagnosis+ participants had the highest average number of traumatic experiences. Additionally, over 90% had experienced IPT compared to 72% of the full sample and 82% of those who were PTSD+. All subtypes of IPT were over-represented in this subgroup. Clinicians may be more likely to recognize PTSD in individuals reporting assault or sexual victimization compared to those reporting traumas such as being in a car accident or witnessing an accidental death. However, when accounting for demographic factors and neurodevelopmental symptoms, mental health symptoms, and functional impairment, traumatic experiences were not a significant predictor of being Diagnosis+ in the PTSD+ subgroup.

Gender

The final key findings of this study pertain to gender identity. Gender and biological sex are important elements in discussions of autism because ASD is historically seen as a male

disorder. This topic is extensively discussed by Lai et al. (2015). ASD has consistently been found to be more prevalent in males, with it often claimed that there are 4-5 males with ASD for every 1 female. However, recent research suggests that autistic females are often overlooked, and the more accurate male:female ratio may be closer to or below 2:1. Studies have revealed a bias towards females being diagnosed with ASD when they have co-occurring intellectual disability or other signs of severe impairment; given equivalent ASD symptoms, males are diagnosed on average at younger ages than females. Much of this diagnostic gap may be due to biases in expectations, overlooking more female-typical symptoms of ASD, greater female ability to "mask" and hide symptoms, and diagnostic overshadowing or substitution of more stereotypically female disorders (e.g., anxiety, depression, or borderline personality disorder) (Lai, Lombardo, Auyeung, Chakrabarti, & Baron-Cohen, 2015). Regardless of the reasons, individual clinicians may still be inclined to think of ASD as something associated primarily with males.

To the contrary, PTSD is primarily associated with women. Women meet criteria for PTSD approximately twice as often as men and are even more over-represented in cases of chronic PTSD. Much of this difference can be attributed to women being more likely to experience sexual and gender-based violence as well as IPT across developmental stages (Lilly & Valdez, 2012; Silove, et al., 2017; Guina, Nahhas, Kawalec, & Farnsworth, 2019; Tolin & Foa, 2006). However, even when examining nonsexual trauma, men might be less likely to meet PTSD criteria than women, and this may be due in part to a greater tendency towards externalizing as opposed to internalizing symptoms. Gendered socialization may encourage or be more tolerable of emotional responses from women and aggressive responses from men, but a PTSD diagnosis requires specific presentations or reports of internalization (Tolin & Foa, 2006).

For these reasons, even when all else is equivalent, clinicians may be quicker to recognize PTSD in women than in men.

In this study, cisgender men were the least likely to be professionally diagnosed with PTSD. This was true even when considering only the PTSD+ subgroup. Only 12% of cisgender men who were PTSD+ were Diagnosis+ compared to one-third of cisgender women and trans men, almost half of nonbinary individuals, and over half of trans women. Gender was significantly and strongly predictive of PTSD diagnosis status in the logistic regression for the PTSD+ subgroup. One explanation for this finding is that autistic cisgender men are caught in a dissonance between ASD being seen as prototypically male and PTSD being associated more strongly with women. Additional research is needed on this topic.

Limitations

This study used data from an online survey, and participants were considered PTSD+ based on their responses to the *PCL-5*. It is possible that outcomes would have been different if professionals screened and diagnosed participants in person. Participant self-reported professional diagnoses were not confirmed with medical records, and it is also possible that these reports were not entirely accurate or complete. Additionally, the participants in this study may not reflect autistic adults as a whole. For example, the findings in this study may not replicate in populations of autistic adults who have lower literacy, cannot tolerate answering questions about their mental health and trauma history, or are not in online autism-centric communities and so could not be recruited or were not interested in participating. Additionally, the findings may have differed if more racial/ethnic minorities and older autistic adults were recruited.

Implications

This study has important implications for identifying PTSD in autistic adults. Less than half of the adults in this sample who met criteria for PTSD had a professional PTSD diagnosis, and autistic cisgender men, although less likely to develop PTSD, were especially likely to remain undiagnosed when PTSD was present. A diagnostic gap this large highlights that many autistic adults are not receiving appropriate treatment for their posttraumatic stress. This is especially problematic because of the association between PTSD and more severe mental health symptoms and daily life impairment. Clinicians should be aware of the possibility of their autistic clients having undiagnosed PTSD and be careful not to overlook the risk for autistic cisgender men despite opposing gendered associations for ASD and PTSD. Special efforts may be necessary to reach severely impaired autistic adults who may be hesitant or unable to access therapy on their own. More research is needed on the effects of previous treatment on obtaining a PTSD diagnosis.

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Table 1. Demographic Information

Demographic variable	N (%)[a]	PTSD+, N (%)[b]	Diagnosis+, N (%)[c]
Age			
18 to 21	191 (28%)	90 (30%)	24 (18%)
22 to 30	249 (36%)	117 (40%)	63 (47%)
31 to 40	152 (22%)	54 (18%)	27 (20%)
41 or older	84 (12%)	36 (12%)	20 (15%)
χ^2 (df, N)	N/A	6.13 (3, 676)	12.28 (3, 676)[f]
Race and ethnicity [d]			
White	579 (86%)	245 (83%)	103 (77%)
Black	35 (5%)	16 (5%)	12 (9%)
Another racial background	34 (5%)	20 (7%)	11 (8%)
Hispanic	32 (5%)	17 (6%)	8 (6%)
χ^2 (df, N)	N/A	3.53 (1, 674)	9.01 (1, 674)[f]
Education			
Less than high school	45 (7%)	24 (8%)	9 (7%)
High school diploma or equivalent, no college degree	314 (47%)	146 (49%)	61 (46%)
College degree or technical, vocational, or trade training only	226 (33%)	96 (32%)	49 (37%)
Postgraduate degree	90 (13%)	31 (10%)	15 (11%)
χ^2 (df, N)	N/A	5.93 (3, 675)	1.086 (3, 675)

Vocation			
Student	127 (19%)	51 (17%)	17 (13%)
Employed	317 (47%)	121 (41%)	49 (37%)
Unemployed	115 (17%)	58 (20%)	26 (19%)
On or seeking disability	99 (15%)	60 (20%)	38 (28%)
Other	14 (2%)	7 (2%)	4 (3%)
χ^2 (df, N)	N/A	18.34 (4, 676)[f]	29.20 (4, 676)[g]
Gender			
Cisgender women	239 (37%)	100 (35%)	50 (40%)
Cisgender men	226 (35%)	74 (26%)	13 (10%)
Transgender women (male to female)	12 (2%)	7 (2%)	4 (3%)
Transgender men (female to male)	40 (6%)	21 (7%)	11 (9%)
Nonbinary, agender, or other	125 (19%)	81 (28%)	46 (37%)
χ^2 (df, N)	N/A	36.63 (5, 649)[g]	54.99 (5, 649)[g]

Abbreviations: PTSD, posttraumatic stress disorder

[a] Full sample.

[b] Subsample of participants meeting criteria for a provisional PTSD diagnosis; χ^2 is compared to those in the full sample who do not meet criteria for PTSD.

[c] Subsample of participants with a professional PTSD diagnosis; χ^2 is compared to those in the full sample who are not professionally diagnosed with PTSD.

[d] "White" was compared to any racial or ethnic minority for chi-square.

[e] $p < .05$; [f] $p < .01$; [g] $p < .001$

Table 2. Participant Measure Scores and Score Cutoffs

Measure	Cutoff [c]	Full sample M (SD) / N (%)	PTSD+ [a] M (SD) / N (%)	F (df_b, df_w) / χ^2 (df, N)	Diagnosis+ [b] M (SD) / N (%)	F (df_b, df_w) / χ^2 (df, N)
RAADS-R	65	154.19 (32.51)	163.99 (27.07)	51.63 (1, 675)[h]	159.84 (29.93)	5.06 (1, 675)[f]
MDI (Any subscale) [d]		633 (94%)	293 (99%)	23.12 (1, 677)[h]	128 (96%)	1.12 (1, 677)
Disengagement	14	18.04 (4.12)	19.58 (3.61)	82.22 (1, 675)[h]	19.51 (3.98)	22.04 (1, 675)[h]
Depersonalization [e]	9	12.67 (5.41)	14.95 (5.35)	108.81 (1, 675)[h]	15.5 (5.67)	48.77 (1, 675)[h]
Derealization [e]	12	13.39 (5.30)	15.82 (5.00)	133.60 (1, 675)[h]	15.69 (5.51)	33.18 (1, 675)[h]
Emotional constriction	13	14.17 (5.82)	16.46 (5.31)	92.75 (1, 675)[h]	15.97 (5.79)	16.32 (1, 675)[h]
Memory disturbances [e]	11	11.96 (5.12)	14.10 (5.39)	106.15 (1, 675)[h]	13.95 (5.47)	26.00 (1, 675)[h]
Identity disturbances [e]	10	8.62 (5.48)	10.89 (6.69)	104.27 (1, 675)[h]	11.01 (7.26)	33.45 (1, 675)[h]
Clinical subscales ([e]), any		562 (83%)	282 (95%)	53.46 (1, 677)[h]	125 (93%)	12.50 (1, 677)[h]
SDQ-20	35	32.63 (11.16)	38.14 (12.22)	158.16 (1, 674)[h]	38.89 (13.56)	56.97 (1, 674)[h]
GAD-7	10	12.16 (5.83)	15.01 (4.78)	155.89 (1, 675)[h]	13.46 (5.66)	8.44 (1, 675)[g]
BFIS	5.2	4.80 (1.69)	5.47 (1.56)	96.22 (1, 675)[h]	5.40 (1.63)	21.50 (1, 675)[h]

PCL-5 (Total score)	33	34.23 (20.35)	53.03 (10.93)	1,356.53 (1, 675)[h]	48.82 (17.16)	98.18 (1, 675)[h]
PCL-5 (PTSD criteria)		297 (44%)	297 (100%)	N/A	99 (74%)	61.11 (1, 677)[h]

Abbreviations: RAADS-R, Ritvo Autism Asperger Diagnostic Scale – Revised; MDI, Multiscale Dissociation Inventory; SDQ-20, 20-item Somatoform Dissociation Questionnaire; GAD-7, Generalized Anxiety Disorder 7; BFIS, Barkley Functional Impairment Scale; PCL-5, PTSD Checklist for DSM-5; PTSD, posttraumatic stress disorder.

[a] Subsample of participants meeting criteria for a provisional PTSD diagnosis; ANOVA and chi-square are compared to those in the full sample who do not meet criteria for PTSD.

[b] Subsample of participants professionally diagnosed with PTSD; ANOVA and chi-square are compared to those in the full sample who are not professionally diagnosed with PTSD.

[c] See Materials and Procedures for more information on chosen cutoffs.

[d] MDI cutoffs are presented as raw scores; all MDI cutoff t-scores are 80 except for identity disturbances, which has a t-score cutoff of 95.

[e] Corresponds to a psychoform dissociation diagnosis.

[f] $p < .05$; [g] $p < .01$; [h] $p < .001$

Table 3. Participant Trauma Histories

Trauma	Full [a]	PTSD+ [b]		Diagnosis+ [c]	
	M (SD)	M (SD)	F (df_b, df_w)	M (SD)	F (df_b, df_w)
Exposed, any [d]	8.10 (4.10)	8.95 (3.92)	23.26 (1, 662)[i]	9.62 (3.55)	22.71 (1, 662)[i]
Directly experienced [e]	3.56 (2.54)	4.60 (2.71)	100.08 (1, 662)[i]	5.54 (2.45)	114.04 (1, 662)[i]
Trauma	**Full [a]**	**PTSD+ [b]**		**Diagnosis+ [c]**	
	N (%)	N (%)	χ^2 (df, N)	N (%)	χ^2 (df, N)
IPT [f]	485 (72%)	243 (82%)	26.05 (1, 675)[i]	126 (94%)	40.66 (1, 675)[i]
Physical assault	381 (57%)	209 (70%)	40.53 (1, 672)[i]	107 (80%)	36.55 (1, 672)[i]
Sexual assault	212 (32%)	136 (46%)	49.69 (1, 671)[i]	91 (68%)	104.09 (1, 671)[i]
Unwanted sexual	367 (55%)	203 (68%)	39.68 (1, 670)[i]	115 (86%)	67.27 (1, 670)[i]

[a] Full sample.

[b] Subsample of participants meeting criteria for a provisional PTSD diagnosis; ANOVA and chi-square are compared to those in the full sample who do not meet criteria for PTSD.

[c] Subsample of participants professionally diagnosed with PTSD; ANOVA and chi-square are compared to those in the full sample who are not professionally diagnosed with PTSD.

[d] All traumas that participants experienced, witnessed, learned happened to a close friend or family member, or were exposed to as part of their job; "Happened to me," "Witnessed it," "Learned about it," or "Part of my job" endorsed on the Life Events Checklist for DSM-5. All of these types of exposure fit posttraumatic stress disorder Criterion A for a traumatic event.

[e] Traumas that participants personally experienced; "Happened to me" endorsed on the Life Events Checklist for DSM-5.

[f] These items represent interpersonal traumas directed at the participant. For the purpose of this study, assault with a weapon was considered a sub-item to physical or sexual assault and so was not included in analyses. Captivity and combat or exposure to a war zone were excluded from interpersonal trauma analyses due to low endorsement of direct experiencing.

[g] $p < .05$; [h] $p < .01$; [i] $p < .001$

Table 4. Odds Ratios

	Posttraumatic Stress Disorder Diagnosis		
Variable	Model 1	Model 2	Model 3
Age			
22-30	2.653[b]	3.556[c]	3.087[b]
31-40	2.469	5.463[c]	3.804
41-50	4.698[b]	7.146[b]	5.944[b]
51+	5.732[b]	12.901[c]	7.196[b]
Gender			
Cis women	3.940[c]	4.673[c]	4.653[c]
Trans men	7.578[c]	5.100[b]	4.652[d]
Trans women	9.308[b]	9.869[b]	7.106
Nonbinary	8.051[d]	6.380[c]	6.811[c]
Ethnic minority	2.372[b]	1.637	1.397
Education			
Less than high school	1.138	0.746	0.750
College	1.595	1.950	2.121
Postgraduate	0.989	1.399	1.608
Employment			
Unemployed	3.094[c]	3.955[c]	4.285[c]
Student	1.087	1.096	1.359
Disability	3.473[c]	2.682[b]	3.294[b]
Other	3.231	2.404	2.584

Diagnosis status		1.544	1.612
Posttraumatic stress [a]		1.065[c]	1.055[c]
Autistic traits [a]		0.999	1.001
Co-occurring disorders [a]		1.836[d]	1.743[d]
Psychoform dissociation [a]		1.006	1.006
Somatoform dissociation [a]		1.009	1.001
Anxiety [a]		0.911[b]	0.913[b]
Functional impairment [a]		0.750[b]	0.771[b]
Traumas experienced [a]			1.136
Interpersonal trauma			1.366
R^2	0.20	0.34	0.35

Reference groups: Ages 18-21; Cisgender men; Non-Hispanic White; High school education; Employed; Professionally diagnosed with at least one mental health or neurodevelopmental disorder other than PTSD; No history of interpersonal trauma.

[a] Linear variable

[b] $p < .05$; [c] $p < .01$; [d] $p < .001$

Table 5. PTSD Diagnoses by Gender

Gender	N Diagnosed	Gender % [a]	Gender with PTSD % [b]
Cisgender women	50	21%	34%
Cisgender men	13	6%	12%
Trans women	4	33%	57%
Trans men	11	28%	33%
Nonbinary	46	37%	47%
Group differences		$\chi^2(4, N=642)=54.83$[c]	$\chi^2(4, N=283)=23.67$[c]

Abbreviations: PTSD, posttraumatic stress disorder.

[a] The percent of participants of each gender who are diagnosed with PTSD.

[b] From the subsample of participants who meet criteria for PTSD, the percent of participants of each gender who are diagnosed with PTSD.

[c] $p<.001$

Supplementary Table 1. Diagnostic Information

Diagnosis	N (%)[a]	PTSD+, N (%)[b]	Diagnosis+, N(%)[c]
Professional diagnoses			
Autism	446 (66%)	195 (66%)	88 (66%)
Another neurodevelopmental disorder	172 (25%)	83 (28%)	47 (35%)
Posttraumatic stress disorder	134 (20%)	99 (33%)	134 (100%)
Psychoform dissociative disorder	48 (7%)	38 (13%)	32 (24%)
Somatization disorder	14 (2%)	12 (4%)	7 (5%)
Anxiety disorder	356 (53%)	188 (63%)	101 (75%)
Obsessive compulsive or related disorder	88 (13%)	60 (20%)	37 (28%)
Depressive disorder	105 (16%)	60 (20%)	26 (19%)
Other	39 (5%)	18 (6%)	41 (31%)
None	78 (12%)	29 (10%)	0 (0%)
Suspected, unconfirmed diagnoses			
Autism	231 (34%)	102 (34%)	46 (34%)
Another neurodevelopmental disorder	94 (14%)	52 (18%)	19 (14%)
Posttraumatic stress disorder	108 (16%)	67 (23%)	0 (0%)
Psychoform dissociative disorder	96 (14%)	67 (23%)	26 (19%)
Somatization disorder	23 (3%)	16 (5%)	11 (8%)
Anxiety disorder	136 (20%)	61 (21%)	18 (13%)
Obsessive compulsive or related disorder	109 (16%)	50 (17%)	20 (15%)

Depressive disorder	7 (1%)	2 (1%)	0 (0%)
Other	13 (2%)	8 (2%)	3 (2%)
None	205 (30%)	77 (26%)	47 (35%)
Summary			
Professional Diagnoses (M, SD)	2.08 (1.44)	2.56 (1.61)	3.65 (1.37)
Suspected Diagnoses (M, SD)	1.18 (1.09)	1.38 (1.21)	0.99 (0.96)
Only autism (N, %)	94 (14%)	17 (6%)	0 (0%)
Co-occurring condition (N, %)	583 (86%)	280 (94%)	134 (100%)

Abbreviations: PTSD, posttraumatic stress disorder.

[a] Full sample.

[b] Subsample of participants meeting criteria for a provisional PTSD diagnosis.

[c] Subsample of participants professionally diagnosed with PTSD.