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Screening and treatment of trauma-related symptoms in youth with autism spectrum disorder amongst community providers in the United States

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Abstract

Using a cross-sectional survey of 673 multi-disciplinary ASD providers recruited from 5 different sites in the United States, we examined the frequency with which community-based providers inquire about, screen and treat trauma-related symptoms (TRS) in their patients/students and assessed their perceptions regarding the need for and barriers to providing these services. Univariate and bivariate frequencies of self-reported trauma service provision, training needs and barriers were estimated. Multivariable logistic regressions identified provider and patient-related factors associated with TRS screening and treatment. Over 50% of providers reported some screening and treatment of TRS in youth with ASD. Over 70% informally inquired about TRS; only 10% universally screened. Screening and treatment varied by provider discipline, setting, amount of interaction and years of experience with ASD, as well as by patient/student sex, ethnicity and socioeconomic status. Most providers agreed that trauma screening is a needed service impeded by inadequate provider training in trauma identification and treatment. Findings indicate that community providers in the United States of varied disciplines are assessing and treating TRS in youth with ASD, and that evidence-based approaches are needed to inform and maximize these efforts.

Keywords

Autism spectrum disorder; children; trauma; services; providers; post-traumatic stress disorder

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Autism spectrum disorder (ASD) is a neurodevelopmental disorder that occurs in 1 in 59 youth in the United States (U.S.) and is characterized by deficits in social communication and reciprocity as well as problematic repetitive and restricted behaviors (Baio et al. 2018; *Diagnostic and Statistical Manual of Mental Disorders – Fifth Edition [DSM-5]*). Intellectual disability (ID), speech and language impairments, sensory abnormalities, and certain medical and psychiatric conditions co-occur with above population-level frequency (Lyall et al., 2017). Typically diagnosed in childhood, ASD is associated with life-long impairment and a significant public health burden (Lyall et al., 2017).

Exposure to potentially traumatic events (PTEs) is common in the general population and a predictor of physical and psychiatric illness (Felitti et al., 1998; Copeland et al., 2007). Despite heightened rates of psychiatric and medical comorbidity in ASD, limited research has focused on PTEs and trauma-related symptoms (TRS) in this population (Kerns, Newschaffer & Berkowitz, 2015; Hoover, 2015; Rumball, 2018). Recent reviews have drawn attention to this gap and hypothesized that youth with ASD are particularly likely to experience PTEs and TRS, given their dependence on caregivers, communication difficulties, reduced social connectedness and high rates of psychiatric comorbidity (Kerns et al., 2015). Consistent with this hypothesis, recent studies suggest that youth with ASD are more likely to experience maltreatment, peer victimization, community violence, financial stress, parent separation/divorce and to live with individuals with mental health and drug or alcohol problems than youth without ASD (Berg et al., 2017; Hoover & Kaufman, 2018; Kerns et al., 2017; McDonnell et al., 2018). They also indicate that children with ASD who experience PTEs present with more co-occurring psychiatric symptoms, suicidality and poorer academic functioning than those who do not (Hoover & Kaufman, 2018; Kerns et al., 2017; Storch et al., 2013). Together, these findings suggest that TRS may be more prevalent in ASD than previously recognized and raise questions regarding how often ASD providers consider trauma risk and provide trauma services, particularly given a lack of evidence-based guidelines (Kerns et al., 2015; Rumball, 2018).

Youth with ASD are served by many disciplines, including special educators, behavior analysts, psychologists, allied health professionals, social workers, pediatricians and psychiatrists (Dingfelder & Mandell, 2011; McLellan, Huculak, & Sheehan, 2008). Attempts to understand and guide service provision for individuals with ASD must accordingly consider the ways in which professional discipline, and relatedly, provider setting, experience, patient populations and training, influence care (Wainer et al., 2017; Kerns et al., 2018). Moreover, the provision of trauma screening and supports by those in non-mental health disciplines (e.g. health, education) in addition to those in mental health disciplines (psychology, psychiatry, social work) is of interest given the role non-mental health disciplines play in monitoring the overall development and health of youth with ASD (Ko et al., 2008).

This study aimed to examine how often community providers recruited from different sites in the U.S. screen and treat TRS in youth with ASD. In addition, we examined patient and provider-related indicators of screening and treatment and explored provider perceptions regarding the need for and their ability to provide trauma services to youth with ASD.

Methods

Ethical Considerations

This research received ethics review board approval and all participants provided consent.

Sample

The sample was community-based ASD providers who participated in the 2017 Usual Care in Autism Survey (Wainer et al., 2017). The UCAS survey items and design were developed via a mixed-methods process involving multiple rounds of feedback from ASD providers purposefully recruited to represent different disciplines and areas of the U.S. (Wainer et al., 2017; Kerns et al., 2018). Participants were recruited from professional listservs and mailings to schools and community mental health, medical and other treatment centers within 100-mile radii of five different, geographically disparate universities (Drexel University, Philadelphia, PA; Rush University, Chicago, IL; St. John's University, Queens, NY; Michigan State University, East Lansing, MI; Stonybrook University, Stony Brook, NY). Recruitment sources were encouraged to distribute flyers widely within their local networks. Each site aimed to enroll at least 10 providers within 6 key disciplines – psychology, special education, behavior analysis, allied health (speech, occupational, physical therapy), social work and medicine (pediatricians, psychiatrists, neurologists, nurse practitioners).

The survey was designed to assess “usual care” amongst children, adolescents and young adults with ASD, given that prior research has focused primarily on young children. As such, inclusion criteria for the study were (1) working in a professional role with youth with ASD (ages 7–22 years) in the past year; (2) fluency in English; (3) working within 100 miles of one of the 5 research sites. Of the 1231 eligible providers who received email invitations, 701 (56.95%) participated. In addition, providers ($n=28$) who responded “don't know” or “unsure” to both the trauma screening and treatment questions were excluded, since these were the two principal dependent variables. This resulted in a final analytic sample of 673 providers. Providers were recruited as individuals rather than as representatives from specific agencies or groups. They provided data on the type of service settings (hospital, private practice, educational, etc.) in which they worked, but not specific employer or agency names.

Measures

Participants were asked “in what proportion of your patients/students with ASD do you *screen* for” and “*treat* trauma-related symptoms?” – our main dependent variables. Providers were also asked “do you *inquire*” into TRS and 8 adversities (see Table 2 for items) and about the importance of and barriers to identifying TRS in youth with ASD (see Table 5 for items). Items on adversities and barriers were modelled after those in the American Academy of Pediatrics Period Survey and Adverse Childhood Experiences study (Fellitt & Anda, 1998; Szilagyi et al. 2016).

Provider-related independent variables were discipline, years of ASD experience, number of ASD youth served in the past year, percent of practice focused on ASD, having a doctoral or

medical degree, working in an urban setting, and working in a community mental health clinic. Discipline was categorized as: mental health (including psychology, social work, psychiatry), behavior analysis, special education, allied health (speech therapy, occupational therapy, physical therapy), medical (i.e., pediatricians, developmental pediatricians, neurologists, nurses) and other (i.e. those who selected “other” as their discipline). In addition, 2 providers responded that they were marriage and family therapists and 1 responded “unsure.” When providers endorsed more than one type (e.g. psychologist and behavior analyst) they were categorized using this hierarchy: mental health > behavior analysis > education > allied > medical > other. Patient-related independent variables included whether or not the provider reported that they typically served females with ASD, youth with ID, patients of low socioeconomic status (SES), Black/African American youth, Hispanic or Latino youth, Asian youth, and ASD youth seeking treatment for anxiety and externalizing problems.

Analytic Approach

The distribution of sample characteristics was examined across sites and compared between those included and those excluded for missing data on the main dependent variables. Logistic regression analyses identified factors associated with provider-reported trauma screening and treatment. We first considered factors associated with providers who screened any proportion of patients/students with ASD versus those who did no screening (the “any screening” model) and then, among those who reported screening, factors associated with screening all patients/students (the “universal screening” model). Next, we examined factors associated with providers who did at least some treatment versus those who treated no patients/students with ASD for TRS (the “any treatment” model), and then, among those who reported treating, factors associated with treating most or all patients/students versus just some patients/students (the “frequent treatment” model).

Logistic regression analyses examined which variables, among multiple theoretically indicated provider and patient/student characteristics, were significantly and independently associated with trauma service provision. To build final adjusted models two separate regression models were initially fit including, in the first, all 7 provider and, in the second, all 7 patient/student characteristic variables with dummy variables adjusting for site in each model. Providers belonging to groups with very low base rates (medical, marriage and family therapy, unsure) were excluded from these analyses. To balance confounder-control with parsimony, only variables significantly ($p < 0.05$) associated with outcomes in initial models were then included in the final 4 models.

To explore the sensitivity of results to missing data, we compared findings from final models to those from models built following this same approach, but restricted to data from subjects with no missing data on any covariate. In addition, results were also rerun excluding 2 participants flagged by the research team due to irregularities in their attempts to participate (e.g. multiple attempts to participate).

Finally, we considered the univariate distribution of provider responses to questions asked on the importance of, and barriers to, identifying TRS in ASD.

Results

Table 1 displays the characteristics of the provider sample overall and by site. Providers were most commonly mental health and allied health professionals, but behavior analysts, educators, and “other” types were also well-represented. Most providers worked in urban or suburban settings (12% rural settings), provided services to youth with ID, and saw > 30 youth with ASD in the past year. Providers endorsed working in a range of community settings; only 2% reported affiliation with a research clinic. About half of providers had < 10 years of experience in ASD; 10% reported >20 years of experience. Respondents excluded from analyses because they responded “don’t know/not sure” to both trauma screening and treatment questions were significantly less likely to have a medical or doctorate degree, to have seen > 30 ASD youth in the past year, or be mental health providers or behavior analysts, but were similar on all other variables and accounted for < 5% of the initial sample.

Rates of Trauma Screening and Treatment amongst ASD Providers

As shown in Table 2, 74% of providers reported that they inquire about TRS in at least some of their patients/students with ASD, with 56% percent reporting that they screen and 54% reporting that they treat these symptoms in ASD. A smaller proportion of providers reported universally inquiring about (15%), screening (10%) and treating (5%) TRS in ASD. More providers endorsed inquiring about neglect (69%), parent mental illness (68%) and emotional abuse (61%) than physical or sexual abuse (53%), food scarcity (49%) or caregiver incarceration (46%). Only 7– 16% of providers inquired about each of these different forms of adversity in all youth with ASD they support.

Indicators of Trauma Screening

The final model for *any TRS screening* included 6 patient/student-related variables and 4 provider-related variables (see Table 3). This model explained 38% of the variance in trauma screening (Nagelkerke R^2) with 6% of the variance explained by site. Whereas working with females on the spectrum, mental health provider type, working in urban and community mental health settings, and seeing > 30 youth with ASD in the past year were associated with an increased likelihood of trauma screening, providers working with Asian youth were less likely to screen. The unadjusted rates of screening by patient/student and provider related-characteristics are presented in Table 4. Whereas 81% of mental health providers screened at least some youth with ASD for trauma, rates were lower for behavior analysts (59%), allied health (46%) and special education providers (28%). Highest rates of screening were observed in providers working in community mental health (95%), mental health providers (81%), providers working with females on the spectrum (70%) and providers seeing over 30 youth with ASD yearly (67%).

The final model for *universal TRS screening* included 2 provider-related factors, but no patient/student related factors (Table 3). This model explained 27% of the variance in trauma screening (Nagelkerke R^2), with 20% of variance explained by site. The odds of allied health professionals screening were significantly less than those for mental health providers. In addition, the odds of screening by providers with over 20 years of ASD experience were over twice those of providers with less experience (OR: 2.52, 95% CI:1.04, 6.15).

Indicators of Trauma Treatment

The final model for *any TRS treatment* involved 4 patient/student-related factors and 5 provider-related factors (Table 3). This model explained 38% of the variance in trauma treatment (Nagelkerke R^2), with 9% of variance explained by site. Working with females on the spectrum and Hispanic/Latino youth as well as mental health provider type, seeing 30 youth with ASD in the past year, 10 – 20 years of ASD experience, and working in urban and community mental health settings were all independently associated with increased odds of providers offering TRS treatment. By comparison, providers working with Asian youth were significantly less likely to treat TRS. Unadjusted rates of trauma treatment by patient/student and provider characteristics (Table 4) illustrate that trauma treatment was again most common among providers in community mental health (89%) and less common, but not uncommon among behavior analysts (64%), allied health professionals (42%) and educators (33%) relative to mental health providers (73%).

Final models for *frequent TRS treatment* involved 3 patient/student related factors and 3 provider-related factors (Table 3). This model explained 22% of the variance in frequent TRS treatment (Nagelkerke R^2), with 7% of variance explained by site. Whereas mental health provider type, 10 – 20 years of ASD experience, working in a community mental health clinic and working with females on the spectrum were associated with a greater likelihood of providers treating TRS in most or all of their patients/students, providers working with families with low SES were significantly less likely to treat frequently. Unadjusted relationships of frequent treatment with patient/student and provider related-characteristics (Table 4) illustrate that fewer providers endorsed frequently treating TRS in ASD (6%–46%) than those who reported treating trauma in some patients/students (33%–89%). Nonetheless, mental health providers (32%), those working in community mental health clinics (46%), those seeing females with ASD (35%) and those who typically did *not* work with children of low SES (45%) were most likely to treat TRS in most or all of their patients. Special educators (6%) and providers seeing < 30 youth with ASD in the past year (10%) and with < 10 years ASD experience (12%) were among the least likely.

Sensitivity Analyses

When final models for each of the four dependent variables were reconstructed limiting to subjects with no missing data on any candidate covariates (available n's reduced to 593, 339, 564, and 327, respectively), the significant variables in all final models were identical to those ultimately included in Table 3, with one exception. The patient/student-related variable “some or most patients/students female,” was no longer significantly associated with any screening (OR: 1.7, 95% CI: 0.99 – 2.33). We did not alter our decision to retain this variable in the final model, given that the confidence limit barely included the null and that prior research suggests females are more vulnerable to PTEs than males (Hanson et al., 2018). The pattern of results was also unchanged after excluding 2 potentially spurious participants.

Provider Beliefs Regarding Trauma Service Needs

Table 5 shows the univariate frequencies of provider responses to questions on the need for trauma-related service provision in youth with ASD and existing barriers to the provision of

such services. The majority (75%) of providers agreed that “identifying TRS is a needed service for ASD youth” and disagreed (78%) that “it is not possible to identify TRS in ASD.” The majority also agreed that a lack of training in identifying (76%) and treating (75%) TRS as well as a lack of effective treatments (51%) were barriers to identifying TRS in ASD. Though it is plausible that providers in non-mental health disciplines might feel more uncertain about the availability of effective treatments for trauma in ASD than those in mental health disciplines, post-hoc Chi square analyses found no significant differences in providers’ opinions regarding the lack effective treatments. Specifically, the percent of providers within each discipline answering “not sure/don’t know” to this item was: 10% mental health providers, 12% behavior analysts, 15% special educators, 17% allied health professionals, and 16% other disciplines. Further, 57% of mental health providers, 56% of behavior analysts, 55% of special education teachers, 44% of allied health professionals and 48% of those who chose “other” discipline agreed that a lack of effective treatments was a barrier to identifying TRS in ASD.

Discussion

Youth with ASD frequently experience PTEs and TRS, yet evidence-based guidelines for assessing and treating TRS in ASD are lacking. The present study examined how often providers in community settings in the U.S. offer trauma-related services to their patients/students with ASD, considered factors associated with delivering these services, and assessed the perceived need for training to provide these services. Findings suggest that over half of ASD providers in the U.S. believe that delivery of trauma-related services is important and currently inquire about, screen and/or treat TRS in at least some of their patients/students with ASD. Nonetheless, only 10% of providers screened all patients/students for TRS, and approximately 75% felt that more training in trauma identification and treatment for those with ASD is needed. Moreover, prior research suggests that health and mental health providers in community settings typically rely on their clinical skill rather than standardized tools to conduct developmental and mental health screening, even when formal guidelines and standardized methods are available (Romer & McIntosh, 2005; Sand et al., 2005; Weitzman & Wegner, 2015). As such, the provider-reported screening assessed by our survey may represent providers’ concerns about and attention to TRS in children with ASD rather than their use of a formalized screening tool. Taken together, these results suggest a substantial, previously undocumented need for evidence-based guidelines and practices for assessing and treating TRS in youth with ASD.

Findings also suggest that characteristics of U.S. providers and the patients/students with ASD they serve may influence TRS screening and treatment. Multiple, theoretically indicated provider and patient/student characteristics were evaluated concurrently. Many, but not all were found to be independently associated with trauma service provision. Mental health providers were most likely to screen and treat TRS in ASD, but were not alone in these efforts.

Approximately 30 – 60% of other provider types reported screening and treating TRS in at least some of their patients/students with ASD. These findings may reflect the salience of trauma-related issues in children with ASD as well as recent national efforts to increase

trauma awareness amongst multidisciplinary providers who support children (Ko et al., 2008). Notably, educators were least likely to report providing TRS screening (1%) and treatment (6%) to most/all of their students, a finding consistent with their focus on teaching rather than mental health. This finding is also consistent with the accounts of teachers' in general education settings, which highlight a number of challenges related to identifying and providing appropriate care to students dealing with trauma, including understanding what their role as teachers should be and balancing the needs of a single student with those of the class (Alisic, 2012).

Providers in the U.S. were also more likely to offer TRS services if they worked with females on the spectrum and in urban settings and community mental health centers. These findings may reflect higher rates of trauma exposure among urban, minority youth (Roberts et al., 2011; Breslau et al., 2004) and youth treated in community mental health centers (Mandell et al., 2005) as well as the greater risk of sexual victimization and PTSD found in girls (Hanson et al., 2008). Conversely, providers working with Asian youth, but not other minorities, were less likely to screen and treat their patients/students with ASD. Further studies should investigate whether this finding reflects cultural differences in help-seeking behavior amongst Asian youth (e.g. a reluctance to seek and continue mental health treatment) or in how clinicians interact with Asian patients/students (e.g. misinterpreting or missing symptoms due to a lack of cultural sensitivity). Such cultural differences have been identified as potential barriers to providing mental health care for Asian Americans (Leong & Lau, 2001).

Providers were also more likely to screen for TRS in youth with ASD when they had higher levels of interaction and experience with this group. Providers who saw 30 or more youth with ASD in the past year were over twice as likely to screen – and those with more than 20 years of ASD experience were over twice as likely to *universally* screen – than less active or experienced providers. Providers who spend more time with youth with ASD may be more likely to see youth with ASD exposed to trauma, to consider trauma an important issue for youth with ASD, to distinguish between the symptoms of ASD and a comorbid disorder, or to feel comfortable broaching the topic of trauma in this population despite a lack of clinical guidelines.

Working with other, potentially “at risk” populations of youth with ASD, such as youth with ID and those presenting with comorbid mental health problems (Sullivan & Knutson, 2000; Kerns et al., 2017), was not significantly associated with screening or treating TRS once other provider-related characteristics, such as discipline, setting and experience, were considered. Though both ID and mental health concerns are potential indicators of trauma in research, they may not be considered meaningful risk factors by providers. Providers may see children with ASD as at risk for trauma due to their social naivete, regardless of their intellectual functioning, as has been hypothesized by some (see Kerns et al., 2015). The ubiquity of comorbid mental health symptoms, which are estimated to occur in over 70% of youth with ASD, may also reduce their salience as an indicator of trauma risk in this population for providers (Simonoff et al., 2008).

In addition, some variables were associated with trauma treatment, but not screening amongst American ASD providers. For example, providers who worked with low SES families were less likely to treat trauma in their patients/students with ASD than providers who worked with higher SES families. These findings may reflect the difficulty of balancing provision of trauma-related treatment with the care coordination and case management needs of low SES youth. In a recent study, mental health providers working with youth with ASD and co-occurring psychiatric conditions in community mental health clinics noted that care coordination and case management needs often dominate the limited therapeutic time allotted to each family, prohibiting therapeutic gains (Brookman-Frazee, Drahota, Stadnick & Palinkas, 2012). This may be particularly true for families under financial duress whose case management needs are likely to be more prevalent and pressing. Overall, indicators of TRS screening and treatment amongst ASD providers were fairly consistent and suggestive of a concentration of service provision amongst mental health providers, community mental health clinicians and those working with some specific “at risk” groups, such as urban, minority and female youth.

This study offers a first, but limited look at the perceived need for and provision of trauma services amongst a diverse group of ASD providers in the U.S. representing multiple disciplines. Our sample of ASD providers is relatively large and includes providers from different regions and settings, but it is not nationally representative and thus may not reflect the behavior of ASD providers throughout the United States or in other countries. Nonetheless, systematic differences on both indicators and outcomes amongst participants would be necessary for reported associations to be biased by sample selection. It should also be noted that our results reflect provider perceptions about TRS in ASD *as providers defined them*, rather than as defined by the researchers or PTSD diagnostic criteria. The term TRS was chosen because it captures a broad range of behavioral symptoms that can result from trauma, and which may be especially applicable for those with ASD (Kerns et al., 2015; Rumball, 2018). The term is also consistent with our goal of examining the real-world perceptions and practices of providers regarding TRS and related service needs in youth with ASD. A limitation of this approach, however, is that we were unable to compare provider definitions of TRS or their appraisals of PTSD in ASD.

This study also raises, rather than answers, questions regarding what the *content* of trauma services for ASD youth may be. The identification of TRS and PTSD in ASD, and thus also the study and treatment of these constructs in ASD, is complicated by overlapping symptoms between these conditions and a lack of validated measures or guidelines for screening and differential diagnosis (Kerns et al., 2015; Rumball, 2018), an issue which has complicated research into other comorbidities in ASD (Kerns & Kendall, 2012; Rosen et al., 2018). Whether existing screening and assessment tools and interventions, such as trauma-focused cognitive behavioral therapy, are as effective for youth with ASD, requires investigation; at present, there are no evidence-based practices for this subpopulation (Rumball, 2018). Future research should thus examine not only how trauma screening and treatment factor into the usual care of ASD youth, but also what precise measures, strategies and approaches are being utilized to assess and treat TRS (and with what level of success). To successfully gather such data, future research should consider the diverse array of providers that serve youth with ASD, and relatedly their diverse professional vernaculars,

clinical conceptualizations and approaches, all of which may influence what practices they endorse using (Kerns et al., 2018; Wainer et al., 2017) as well as their perceived need for further training in trauma. Relatedly, although providers' self-report of their practices is an important first step, prior research suggest that direct observation of practices will also likely be necessary to accurately characterize the types of services youth with ASD receive in community settings (Schoenwald et al., 2011). Nonetheless, the present findings provide a rationale that this new direction for ASD research is warranted.

The role providers from different disciplines could and should play in providing trauma services to youth with ASD must also be considered. Though mental health providers may be more likely to focus on trauma and its impact in their work, youth with ASD may more regularly and consistently interact with behavior analysts, educators, allied health professionals and pediatricians. These providers may be trained to recognize and appropriately respond to the potential trauma-related reactions of youth with ASD, resulting in appropriate referrals to professionals with specialized training in trauma and reducing the likelihood of long-term impairment, suffering and re-traumatization (Ko et al., 2008). At present, our data suggests a diffuse response to TRS in ASD, wherein youth may receive trauma services unsystematically from various types of providers, whose approaches to screening and treatment are likely to vary widely, and few of whom screen universally. In the absence of research-informed guidelines, providers may simply apply the varied skills they have (e.g., clinical interviewing, psychoeducation, gradual desensitization, arousal regulation strategies, supportive counseling) when they suspect TRS. Given the diverse, complex and often uncoordinated network of providers that serve youth with ASD (Brookman-Frazee et al., 2009), effective and efficient trauma services may hinge on a clarification of roles, training needs and abilities amongst different provider groups and settings to ensure that the trauma services provided are matched to provider skill level, as has been discussed for non-ASD populations (Ko et al., 2008). For example, whereas psychoeducation and screening may be appropriate for all ASD providers, trauma-focused treatment should only be undertaken by those with specialized training. Mixed-method research that engages providers, child service systems (schools, hospitals, clinics), individuals with ASD and their families may assist in this coordination. The perspectives of these stakeholders may also expedite the identification of effective, implementable trauma services for individuals with ASD (Dingfelder & Mandell, 2011; Kerns et al., 2018; Chambers et al., 2013).

Conclusion

Findings suggest that a substantial percentage of community providers serving youth with ASD in the U.S. inquire about, screen and treat TRS in at least some of their students/patients, despite a lack of evidence-based approaches and a professed need for further training. Providers who universally screen for trauma in youth with ASD may, by comparison, be rare. Our findings reveal an under-recognized need for evidence-based approaches to assess and treat TRS in youth with ASD and suggest a compelling new direction for autism research.

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Table 1.

Sample Characteristics (N=673)

<i>Patient/Student-Related Characteristics</i>	Total % (N)	Drexel n=155	Rush n=162	St. John's n=149	Michigan State n=144	Stony Brook n=63
Sometimes/Frequently Treated Female Youth with ASD (n=670)	23% (156)	18% (28)	21% (34)	17% (26)	34% (49)	31% (19)
Sometimes/Frequently Treated ID (n=652)	91% (595)	91% (137)	94% (150)	86% (123)	94% (130)	87% (55)
Race/Ethnicity of Youth Treated*						
White	83% (557)	81% (126)	68% (110)	84% (125)	93% (134)	98% (62)
Black or African American	54% (364)	70% (108)	41% (67)	54% (80)	50% (72)	59% (37)
Hispanic/Latino	55% (368)	36% (56)	70% (114)	48% (72)	60% (87)	62% (39)
Asian	32% (212)	34% (52)	24% (39)	31% (46)	40% (57)	29% (18)
Treat Youth of Low SES	57% (380)	70% (108)	46% (75)	52% (77)	56% (80)	63% (40)
Presenting Issues Treated in Youth with ASD*						
Social Skill Deficits	87% (584)	89% (138)	91% (148)	90% (134)	75% (108)	89% (56)
Anxiety	65% (434)	67% (104)	57% (93)	62% (93)	70% (101)	68% (43)
Externalizing Problems	83% (556)	82% (127)	87% (141)	84% (125)	81% (116)	75% (47)
<i>Provider-Related Characteristics</i>						
Provider Type (N=673)						
Mental Health	32% (211)	29% (45)	30% (49)	34% (51)	30% (43)	37% (23)
Behavior Analysis	16% (109)	12% (19)	24% (40)	11% (16)	21% (30)	6% (4)
Special Education	14% (95)	8% (13)	12% (19)	29% (43)	10% (15)	8% (5)
Allied Health (OT, PT, ST)	21% (140)	21% (33)	20% (32)	13% (20)	27% (39)	25% (16)
Medical	3% (22)	8% (12)	2% (3)	3% (4)	1% (2)	2% (1)
Marriage and Family Therapist	<1% (2)	1% (2)	0% (0)	0% (0)	0% (0)	0% (0)
Unsure	<1% (0)	1% (1)	0% (0)	0% (0)	0% (0)	0% (0)
Other	14% (93)	20% (30)	12% (19)	10% (15)	11% (15)	22% (14)
Year Experience in ASD						
0–10 years	52% (348)	61% (94)	43% (69)	60% (89)	48% (69)	43% (27)
11–20 years	38% (254)	28% (44)	52% (84)	31% (46)	39% (56)	38% (24)
> 20 years	10% (70)	11% (17)	6% (9)	9% (14)	13% (18)	19% (12)
Doctoral Degree	20% (137)	24% (37)	17% (28)	32% (22)	14% (20)	32% (20)

<i>Patient/Student-Related Characteristics</i>	Total % (N)	Drexel n=155	Rush n=162	St. John's n=149	Michigan State n=144	Stony Brook n=63
< 30 Youth with ASD this year (n=656)	35% (229)	38% (59)	28% (43)	53% (78)	20% (28)	34% (21)
Percent Practice Focused on ASD (n=668)						
0–25%	29% (191)	40% (62)	17% (28)	41% (60)	17% (24)	27% (17)
26–79%	42% (284)	32% (49)	58% (93)	23% (34)	55% (78)	48% (30)
80–100%	29% (193)	28% (43)	25% (40)	37% (54)	29% (41)	24% (15)
Work Setting *						
Other	29% (198)	34% (52)	22% (35)	36% (54)	24% (34)	23 (37%)
Private Practice	24% (158)	22% (34)	27% (44)	15% (23)	27% (39)	29% (18)
Community Mental Health Center	11% (74)	20% (31)	7% (12)	3% (5)	15% (21)	8% (5)
Outpatient Clinic at Hospital	14% (97)	14% (21)	19% (30)	9% (13)	15% (21)	19% (12)
Outpatient Clinic in Research Center	2% (16)	3% (4)	3% (4)	1% (2)	4% (5)	2% (1)
Special School/ Classroom for ASD	32% (212)	32% (50)	21% (34)	38% (57)	40% (58)	21% (13)
University Counseling Center	4% (24)	1% (1)	9% (14)	1% (1)	5% (7)	2% (1)
Community Setting *						
Urban	64% (428)	70% (109)	69% (111)	54% (81)	64% (92)	56% (35)
Suburban	70% (473)	73% (113)	61% (99)	65% (97)	79% (113)	81% (51%)
Rural	12% (78)	15% (23)	7% (11)	5% (7)	20% (29)	13% (8)

* not mutually exclusive categories. ID = children with ASD and intellectual disability, SES = socioeconomic status.

Table 2.

Rates of trauma-related symptom (TRS) screening and treatment amongst community ASD providers from 5 sites in the United States (N=673)

<i>"In what proportion of your patients/students with ASD do you..."</i>	Proportion of Patient/Students				
	Unsure	None	Some	Most	All
Inquire About TRS	1% (7)	24% (166)	42% (281)	18% (119)	15% (100)
Screen for TRS	1% (9)	42% (285)	28% (188)	18% (123)	10% (68)
Treat TRS	2% (11)	44% (299)	34% (231)	15% (98)	5% (34)
<i>"In what proportion of your patients/students with ASD do you inquire about..."</i>	Unsure	None	Some	Most	All
Physical or Emotional Neglect	2% (13)	29% (197)	40% (265)	16% (110)	13% (88)
Parent Mental Illness	2% (16)	30% (198)	39% (264)	13% (88)	16% (107)
Emotional Abuse	2% (15)	37% (247)	36% (241)	13% (85)	13% (85)
Parent Substance Abuse	4% (24)	36% (248)	37% (246)	10% (68)	13% (87)
Domestic Violence	2% (17)	44% (296)	34% (228)	10% (65)	10% (67)
Physical or Sexual Abuse	2% (17)	45% (300)	30% (201)	11% (73)	12% (82)
Food Scarcity	3% (23)	48% (320)	33% (224)	9% (59)	7% (47)
Incarceration of Caregiver	4% (26)	50% (336)	29% (198)	8% (53)	9% (60)
					46% (311)

Table 3.

Odds Ratios (OR) and 95% Confidence Intervals (CI) for variables included in the four final multivariable logistic regression models.

Site	Any TRS Screening N=599, R ² = _{.38}	Universal TRS Screening N=359, R ² = _{.27}	Any TRS Treatment N=617, R ² = _{.38}	Frequent TRS Treatment N=343, R ² = _{.22}
Drexel	Reference	Reference	Reference	Reference
Rush	1.03 (0.56, 1.89)	0.04 (0.01, 0.17)	1.22 (0.68, 2.19)	1.95 (0.88, 4.31)
St. John's	0.45 (0.24, 0.83)	0.37 (0.16, 0.91)	0.48 (0.27, 0.87)	1.14 (0.44, 2.99)
SDSU	1.22 (0.65, 2.31)	0.26 (0.12, 0.59)	1.33 (0.73, 2.43)	2.83 (1.32, 6.10)
Stony Brook	0.92 (0.43, 1.96)	0.50 (0.19, 1.31)	1.13 (0.54, 2.38)	1.33 (0.49, 3.58)
<i>Patient/Student-Related Characteristics</i>				
Co-occurring ID	1.41 (0.72, 2.73)	-	-	-
Female Youth with ASD	1.69 (1.03, 2.77)	-	1.85 (1.14, 2.99)	2.08 (1.21, 3.57)
Black/African American	1.07 (0.68, 1.70)	-	-	-
Hispanic or Latino	1.47 (0.93, 2.33)	-	2.01 (1.31, 3.09)	-
Asian	0.48 (0.31, 0.75)	-	0.45 (0.29, 0.70)	-
Low SES	-	-	-	0.59 (0.35, 0.99)
Anxiety and Externalizing Problems*	0.94 (0.49, 1.80)	-	0.98 (0.51, 1.87)	0.94 (0.49, 1.80)
<i>Provider-Related Characteristics</i>				
Provider Type	Reference	Reference	Reference	Reference
Mental Health	Reference	Reference	Reference	Reference
Behavior Analysis	0.29 (0.16, 0.54)	0.62 (0.24, 1.57)	0.61 (0.34, 1.11)	0.71 (0.37, 1.35)
Special Education	0.13 (0.07, 0.26)	0.14 (0.02, 1.15)	0.24 (0.13, 0.44)	0.32 (0.12, 0.87)
Allied Health Professional	0.15 (0.08, 0.28)	0.25 (0.09, 0.71)	0.22 (0.12, 0.39)	0.63 (0.31, 1.28)
Other	0.17 (0.09, 0.32)	0.90 (0.37, 2.18)	0.26 (0.14, 0.47)	0.37 (0.14, 0.99)
Works in Urban Setting	1.92 (1.24, 2.96)	-	1.61 (1.07, 2.42)	-
Works in Community Mental Health Clinic	8.51 (2.88, 25.18)	-	4.96 (2.16, 11.38)	2.47 (1.28, 4.76)
Serves 30 with ASD	2.58 (1.68, 3.96)	-	2.66 (1.76, 4.02)	-
Years experience with ASD	Reference	Reference	Reference	Reference
<10 years	-	Reference	Reference	Reference
10-20 years	-	0.87 (0.43, 1.75)	1.87 (1.23, 2.84)	1.83 (1.06, 3.18)
> 20 years	-	2.52 (1.04, 6.15)	1.25 (0.64, 2.46)	1.62 (0.67, 3.95)

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Note: Bold font indicates a significant ($p < .05$) effect. ID = Intellectual Disability, SES = Socioeconomic Status. Empty cells reflect variables not included in the final analysis for each outcome due to a lack of significance in initial models. Medical providers (n=22) and marriage and family therapists (n=2) were excluded from analyses due to their low base rate in the sample.

Table 4.
Frequency of Screening and Treatment of Trauma Related Symptoms (TRS) by Provider and Patient Characteristics

	% (n) Any TRS Screening	% (n) Universal TRS Screening	% (n) Any TRS Treatment	% (n) Frequent TRS Treatment
<i>Patient/Student Related Characteristics</i>				
Co-occurring ID				
No	42% (25)	7% (4)	41% (23)	13% (7)
Yes	60% (351)	11% (64)	58% (338)	21% (125)
Some or Most Patients/Students Female				
No	53% (267)	10% (52)	51% (256)	15% (76)
Yes	70% (109)	10% (15)	68% (105)	35% (54)
Asian				
No	60% (276)	11% (48)	58% (264)	22% (102)
Yes	50% (103)	10% (20)	48% (99)	15% (30)
Hispanic or Latino				
No	51% (155)	13% (38)	46% (137)	18% (53)
Yes	62% (224)	8% (30)	62% (226)	22% (79)
Low SES				
No	57% (165)	7% (20)	55% (158)	45% (71)
Yes	57% (214)	13% (48)	55% (205)	30% (61)
<i>Provider-related Characteristics</i>				
Provider Type				
Mental Health Providers	81% (169)	19% (39)	73% (210)	32% (68)
Behavior Analysts	59% (62)	7% (7)	64% (68)	24% (25)
Special Education Teachers	28% (26)	1% (1)	33% (94)	6% (6)
Allied Health Professionals	46% (63)	4% (5)	42% (57)	14% (19)
Work in Urban Settings				
No	46% (111)	9% (21)	45% (108)	13% (31)
Yes	63% (268)	11% (47)	61% (255)	24% (101)
Work in Community Mental Health Clinic				
No	53% (310)	8% (46)	51% (297)	17% (98)
Yes	95% (69)	30% (22)	89% (66)	46% (34)

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	% (n) Any TRS Screening	% (n) Universal TRS Screening	% (n) Any TRS Treatment	% (n) Frequent TRS Treatment
# Youth with ASD Served in Past Year				
< 30 youth with ASD	38% (85)	10% (22)	34% (76)	10% (23)
30+ youth with ASD	67% (282)	11% (45)	65% (273)	25% (103)
Years Experience in ASD				
<10 years	52% (177)	10% (35)	47% (158)	12% (42)
10–20 years	65% (162)	8% (19)	67% (251)	30% (75)
> 20 years	57% (39)	20% (14)	53% (37)	20% (14)

Table depicts the percentage and number of providers who endorsed TRS screening, universal TRS screening, TRS treatment and frequent TRS treatment per the characteristics of their patient population (Patient/student Related Characteristics) and provider characteristics. Note: total Ns (not presented) varied for each cell due to missing data on some provider and patient-related characteristics. Percentages (n) for each cell reflect these varied totals. Medical providers (n=22) and marriage and family therapists (n=2) were excluded from the provider type category due to their low base rate in the sample.

Table 5. Provider’s beliefs regarding the need and barriers to identifying trauma-related symptoms in ASD (N=673)

<i>“How much do you agree or disagree with the following statement:”</i>	Agree	Disagree	Neutral	Unsure
Identifying trauma symptoms is a needed service for youth with ASD	75%	7%	15%	3%
It is not possible to identify trauma-symptom in ASD	9%	78%	11%	3%
<i>“Rate how much you agree or disagree that the following are barriers to identifying trauma-related symptoms in ASD:”</i>	Agree	Disagree	Neutral	Unsure
Lack of training in identifying trauma symptom in ASD	76%	7%	14%	3%
Lack of training in treatment of trauma in symptoms in ASD	75%	7%	14%	4%
Lack of effective treatments for trauma in ASD	51%	12%	24%	13%