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Mental Health Crisis Screening in Youth with Autism Spectrum Disorder

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ABSTRACT

Objective: While a growing body of evidence suggests youth with autism are at increased risk of experiencing a mental health crisis, no study has screened for crises in an outpatient setting. The current study fills this gap by examining a) the feasibility and utility of conducting routine crisis screenings; b) the psychometrics of a brief crisis screener (the Mental Health Crisis Assessment Scale-Revised; MCAS-R); and, c) the prevalence of and types of behaviors associated with crises.

Method: This study was conducted at two different outpatient mental health clinics. Screenings were conducted using the MCAS-R, a 23-item parent report measure. A total of 406 youth with autism (76% Male; 72% White; M = 11.2y; SD = 3.5y), evenly divided across clinics, were screened. Seven clinicians conducted a clinical visit, which incorporated the results of the MCAS-R, to determine whether the child was in crisis.

Results: Eighty percent of youth were successfully screened, suggesting crisis screening is feasible. Most parents (73%) felt the MCAS-R helped communicate concerns with the clinician; few (<6%) felt the survey was too long or upsetting. All clinicians (100%) indicated that the MCAS-R was very helpful in facilitating communication and identifying/mitigating safety concerns; although, 33% reported screenings “sometimes” interrupted clinical flow. The MCAS-R strongly aligned with clinician ratings (88% correctly classified). Twenty percent of youth met the cutoff for crisis; aggression and self-injurious behaviors were the most common reasons for crises.

Conclusion: This study suggests that outpatient crisis screening via the MCAS-R is feasible, accurate, and well received by parents and clinicians.

Abbreviations: ASD: Autism Spectrum Disorder; MCAS-R: Mental Health Assessment Crisis Scale-Revised; DSM-5: Diagnostic and Statistical Manual, 5th Edition; ADOS-2: Autism Diagnostic Observation Schedule, Second Edition; ROC: Receiver Operating Curve

Introduction

A growing body of literature suggests that youth with autism spectrum disorder (ASD) are at increased risk for mental health crises due to their high rates of psychiatric and behavioral disorders, frequent psychiatric emergency room visits, and inpatient psychiatric hospitalizations (Kalb, Stuart et al., 2019; Simonoff et al., 2008; Vasa et al., 2020). The impact of mental health crises in youth with ASD is detrimental to both the child and family, resulting in polypharmacy, restraint, seclusion, as well as restrictive educational, and residential placements (Logan et al., 2015; O’Donoghue et al., 2020). Early identification, prevention, and treatment of mental health crises could mitigate these harmful outcomes, improve child and family quality of life, and reduce health-care costs.

Several measures have been developed to assess crises in typically developing individuals. Examples of these measures are the Color-Risk Psychiatric Triage Scale (Molina-

Lo’pez et al., 2016), the Crisis Triage Rating Scale (Bengelsdorf et al., 1984), the Triage Assessment Form (Hamm et al., 2010), and the Crisis Risk and Adaptive Functioning Tool (Stokoe, 2012). There are several notable limitations of these measures, however. This includes limitations in scope (e.g., a narrow focus on suicidality), application (e.g., clinician administration only), and utility (e.g., none are validated in children, much less those with ASD). Since youth with ASD have higher rates of aggression, self-injurious behaviors, and elopement – compared to neurotypical children – the phenomenon of mental health crises may differ in this group (Kiely et al., 2016; Lai et al., 2019; Simonoff et al., 2008).

Until recently, there has not been a unified or consistent approach to measuring crises in children with ASD. Most ASD investigators use informant-reported mental health measures that capture specific symptoms and/or behaviors. This includes measures such as the

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Aberrant Behavior Checklist and the Emotion Dysregulation Inventory (Aman et al., 1985; Mazefsky et al., 2018). Weiss et al. (2014) developed a novel approach to measuring crises via the Brief Family Distress Scale. This single item assesses the global state of the family as it relates to crisis but does not provide information on the child's psychiatric symptoms or the impact of such. Weiss and colleagues also conducted qualitative research to better conceptualize crisis in ASD (Weiss & Lunsky, 2011; Weiss et al., 2014; White et al., 2012). While this work suggests crises can be characterized by four features (acute behaviors of the child, impact of the child's behavior on the family, use of psychiatric emergency services, and greater need for parental supports), this work did not result in the development of a measurement tool to our knowledge.

Given the enormous toll of mental health crisis in ASD, it is imperative to continue efforts to develop ASD-specific crisis screening measures. In response to this need, Kalb et al. (2017) developed the Mental Health Crisis Assessment Scale (MCAS). This informant report scale employs the theoretical framework of crisis that is based on the American Psychiatric Association's (APA) definition of a psychiatric emergency. The APA definition states that a mental health crisis represents a lack of immediate resources available to manage an acute psychiatric or behavioral event that poses imminent danger (Allen et al., 2002). The MCAS operationalizes this APA definition through two constructs: a) acuity (i.e., dangerousness) and b) behavioral efficacy (i.e., caregivers' perceived ability to manage their child's behavior). The MCAS also identifies which particular challenging behaviors, known to be highly prevalent and impairing in ASD, that can result in crisis. In sum, the uniqueness of the MCAS is reflected in its design (a brief, informant-report), content (acuity and behavioral efficacy subscales), specificity (designed for ASD), and use (screening, treatment planning).

To date, only one study has systematically examined mental health crises in youth with ASD using the MCAS (Vasa et al., 2020). This study, conducted among an online research registry, reported 32% of the sample met the cutoff for crisis in the past 3 months (the MCAS reporting period). The behaviors most likely to lead to crisis were elopement and self-injury, in young youth (3–11 years), and physical and verbal aggression, in older youth and young adults (12–25). Younger age, increased parental depressive symptoms, and lower family quality of life were all significantly associated with higher crisis total scores. While valuable, that study had several limitations. Chief among them were the low response rate and the use of an online recruitment source. Furthermore, the study did not examine

how the MCAS aligns with a clinician's determination of crisis in outpatient settings. The current study seeks to overcome these limitations.

Four aims were examined in this study. Aim 1 sought to determine the feasibility of implementing the MCAS as a screening tool in the outpatient clinic setting, as determined by the proportion of the sample successfully screened. Aim 2 was to examine the psychometric properties of a revised version of the MCAS, which was based on the findings from this study and will hereafter be referred to as the MCAS-R [Revised], including how well it aligned with clinician determination of crises in outpatient clinics. Aim 3 evaluated the prevalence of mental health crises in outpatient clinics and the types of behaviors that contributed to the crisis. Aim 4 examined parent and clinician satisfaction with the crisis screening protocol. We have no a priori hypotheses for these aims since this is the first study to conduct a crisis screening in ASD in the outpatient setting. Findings from this study are important for early detection and treatment of mental health crises, with the goal of improving quality of life for these youth and families.

Methods

Setting and Inclusion Criteria

Data for the study were gathered via telehealth, between February 2020 and April 2021, from two outpatient ASD specialty centers located in the mid-Atlantic region of the United States. The first setting is a psychiatric clinic that is staffed by child and adolescent psychiatrists. This clinic is nested within a larger university-affiliated multidisciplinary ASD center that also provides medical and developmental services to youth with ASD. Services provided by the psychiatric clinic include diagnostic and pharmacological management as well as referrals to social work, psychology, and other specialists to facilitate a coordinated multidisciplinary treatment approach to care. This ASD center is situated in an urban location and serves a racially and socioeconomically diverse clientele. Three children and adolescent psychiatrists from the psychiatric clinic took part in this study (including study authors F.D, R.M, and R.V).

The second clinic is a behavioral clinic that is staffed by masters-level behavioral therapists. This clinic is part of a larger developmental disability clinic, located in a rural setting, in a neighboring state that is about 80 miles north of the psychiatric clinic. This clinic uses a multidisciplinary team to deliver a coordinated team-based approach to care. Services provided by this clinic include but are not limited to psychiatric care, individual, family and group therapy, consultative services,

and applied behavior analysis. Our behavioral specialists took part in this study (including authors F.D., R.M., and R.V.).

To be included in this study, youth were established patients who were receiving ongoing mental health treatment at either of the outpatient clinics. At both clinics, the child's ASD diagnosis was based on expert clinician assessment using Diagnostic and Statistical Manual, Version-5 (DSM-5) (American Psychiatric Association, 2013) ASD criteria, and supplemented by the Autism Diagnostic Observation Schedule, 2nd Edition as needed (Lord et al., 2012). Patients with an established ASD diagnosis, versus those seeking a diagnostic evaluation for ASD, were included because it was important clinicians had existing therapeutic rapport when reviewing crisis scores. Clinicians also had knowledge about prior levels of crisis, which was necessary to validate the MCAS-R. Each child was only screened once during the study time frame. The sample size was determined based on recruitment targets set by the funding mechanism. This quality improvement study was conducted as part of routine clinical practice; thus, no incentive was provided. As such, the local Institutional Review Board at each site approved this project under a waiver of consent.

Participants

Table 1 presents the sample characteristics. A total of $N = 406$ youth were screened, which was equally divided across the two sites. Overall, most youth were less than 13 years of age (52%), male (76%), White (72%), not Hispanic (94%), and had commercial insurance (50%). The MCAS-R was usually completed by the mother (82%), and respondents most often had some college education or a Bachelor's degree (40%). Few youth had a prior hospitalization, ED visit for psychiatric reasons, or involvement with 911 in the prior 3 months (6%).

Procedures

Crisis Screening Process

Each clinic implemented the MCAS-R electronically through administration procedures that differed depending on each site. In the psychiatric clinic, the MCAS-R was emailed to the family via a survey link one week prior to the appointment. If caregivers did not complete the MCAS-R within 3 days of the appointment, the study coordinator provided an additional reminder via e-mail and telephone. Since the data were gathered pre-appointment, all caregivers who completed the MCAS-R were provided crisis contact information if they had any immediate concerns. For youth who screened positive

Table 1. Sociodemographic characteristics across sites.

	Psychiatric Clinic	Behavioral Clinic	Total Sample
<i>N</i> (%)	202 (50)	204 (50)	406 (100)
Child age (%)			
1–8 years	25 (12)	66 (32)	91 (22)
9–12 years	53 (26)	67 (33)	120 (30)
13–18 years	91 (45)	71 (35)	162 (40)
18–32 years	33 (16)	0 (0)	33 (8)
Child sex (%)			
Male	152 (75)	150 (78)	302 (76)
Female	50 (25)	43 (22)	93 (23)
Race (%)			
White	116 (58)	134 (89)	250 (72)
Black	44 (22)	3 (2)	47 (13)
Asian	10 (5)	1 (1)	11 (3)
Multiracial	1 (1)	12 (8)	13 (4)
Other	27 (14)	0 (0)	27 (8)
Ethnicity (%)			
Not Hispanic	202 (100)	178 (87)	380 (94)
Hispanic	0 (0)	26 (13)	26 (5)
Respondent (%)			
Mother	158 (78)	174 (86)	332 (82)
Father	35 (17)	22 (11)	57 (14)
Other	9 (5)	6 (3)	15 (4)
Respondent educational level (%)			
High School-Trade	55 (28)	97 (48)	152 (38)
Some College-Bachelors	78 (40)	80 (40)	158 (40)
Graduate School	61 (31)	24 (12)	85 (21)
Child insurance (%)			
Medical assistance	114 (58)	11 (6)	125 (32)
Commercial	83 (42)	113 (58)	196 (50)
Both	0 (0)	69 (36)	69 (18)
Hospitalization, ED, 911 (%) ^a			
No	188 (93)	195 (96)	383 (94)
Yes	14 (7)	9 (4)	23 (6)

Note: ^aPrior psychiatric hospitalization, emergency department visit (ED), or involvement with 911 or the police in the prior 3 months.

for crisis risk, caregivers were offered an emergency social work evaluation. Nearly half (48%) of caregivers who screened positive requested the emergency evaluation.

For the behavioral clinic, clinicians provided a link to the MCAS-R for the parent to complete during virtual therapy appointments. Once the caregiver completed the MCAS-R, across both clinics, clinicians received an immediate e-mail that provided them with the results of the MCAS-R. At both clinics, clinicians were asked to incorporate the results of the MCAS-R into their clinical evaluation to determine the child's level of crisis.

MCAS-R

The electronic link to the MCAS-R first asked parents to provide basic demographic and clinical information about their child and family. After completion of this section, parents completed the MCAS-R, a 23-item parent report of crisis. The MCAS-R takes 5–10 min to complete, requires a 7th-grade reading level, is divided into three sections, and has a three-month reporting period. Section 1 asks parents to rate the

severity of 13 mental health behaviors commonly seen in ASD (e.g., physical aggression and elopement). If a parent does not rate any of these behaviors as moderate or severe, they do not complete the remainder of the MCAS-R as their child is not at-risk of crisis. Parents who rate at least one behavior as moderate or severe move on to Section 2, which asks them to select up to three of the 13 behaviors that could cause the greatest harm to the child. Section 3 then asks parents to complete eight questions about the dangerousness of the behavior(s) (termed the acuity subscale) selected in Section 2 (e.g., “I am concerned about my safety when my child acts this way, I am nervous about my child’s safety in these situations”). Section 3 also asks parents three questions about their ability to safely manage the child’s behavior(s) (termed the behavioral efficacy subscale) identified in Section 2 (e.g., “I can effectively handle my child’s behavior”). Response options for the acuity and behavioral efficacy subscales are based on a 5-point Likert scale. The MCAS-R score is the sum of the acuity and behavioral efficacy subscales. A score of 16 or higher suggests the child is at risk of crisis. Details regarding the classification of MCAS-R scores are reported below.

Results from the original MCAS development study found that the measure demonstrated strong internal construct validity (via exploratory and confirmatory factor analyses), external convergent validity (strong associations with parental stress and family distress), and reliability (via internal consistency; $\alpha = .88$; Kalb et al., 2018). Overall, 79% of youth were accurately identified as in crisis (vs. not) via the MCAS when compared to a semi-structured, masked interview. Additional psychometrics on the MCAS are provided below. The MCAS-R is free and publicly available. It can be obtained by emailing the first and/or last authors of this study.

Clinician Determination of Crisis

Prior to study onset, inter-rater reliability regarding the identification of mental health crisis was established among the clinicians. This was achieved through one to two-hour individual or group meetings with clinicians. The PI of the project (L.K.) presented a PowerPoint presentation that oriented clinicians to the definition of a mental health crisis and presented criteria to classify youth according to four levels: 1) no crisis (i.e., no safety issues and parents are generally effective at management), 2) low risk of crisis (i.e., safety concerns are minor and/or parent’s management strategies are ineffective), 3) high risk (i.e., safety concerns are present), and 4) in crisis (i.e., clear threat of harm). Once the clinicians felt comfortable with identifying a child’s

level of crisis, they independently scored five case vignettes online. All clinicians established a high level of agreement (80% or greater) with consensus rating of the vignettes, as determined by the study authors (L.K. and R.V).

After the MCAS-R was submitted online by caregivers, each clinician immediately received the patient’s score and reviewed results prior to or during their appointment. The clinicians then conducted their own crisis assessment during the appointment. Clinician assessment and the MCAS-R were not independent given that this study occurred during clinical practice (i.e., the goal was to inform clinical practice via the MCAS-R). Prior research in an online sample established a strong association between the MCAS-R and masked clinical assessment (see Kalb et al., 2018 for details).

After the visit, each clinician integrated the results of the MCAS-R with their own clinical evaluation to provide an individual rating of the child’s level of crisis according to the four levels described above. For the analysis, clinician level of crisis was dichotomized as Low vs. High Risk since so few youths were deemed actively “in crisis” (2%). The Low group was comprised of youth in no crisis or low risk of crisis and the High group included youth at high risk or in crisis.

Parent and Clinician Satisfaction with the Screening Process

After the clinical appointment, parents received a three-question anonymous electronic survey. The questions asked if the parent felt the MCAS-R was “too long,” “made them upset,” and helped “communicate your child’s needs with your provider.” Response options included No, Somewhat, Yes, and Unsure. After study completion, clinicians also filled out an anonymous electronic survey about their experience with the MCAS-R. Questions asked if the MCAS-R “helped facilitate communication with parents,” “identified or mitigated safety concerns,” “identified treatment needs that would have been otherwise missed,” “interrupted the clinical flow,” “upset parents,” and “was ultimately useful for clinical practice.”

Analysis

Descriptive and bivariate (e.g., chi-square and ANOVA) statistics were used to examine the proportion of youth successfully screened, prevalence of crises, perceived utility of the screening program, and differences across sites. Classification statistics were used to examine the alignment of the MCAS-R with clinician determination of crisis risk. This included Receiver Operating Curves (ROC), which produced sensitivity, specificity, and

positive and negative predictive validity (PPV, NPV) values (Laracy et al., 2016). Chronbach's alpha was used to assess internal consistency, and confirmatory factor analysis (CFA) was employed to evaluate the factor structure using a series of fit indices (Curran et al., 1996). These included root mean square error of approximation (RMSEA), the comparative fit index (CFI), the Tucker-Lewis index (TLI), and Standardized Root Mean Square Residual (SRMR). A CFI and TLI of ≥ 0.9 is considered an acceptable fit, whereas ≥ 0.95 reflects a good fit. RMSEA < 0.10 and SRMR < 0.08 are considered a good fit (Hu & Bentler, 1999). Overall, there was little missing data ($< 4\%$), except for race (14%). All analyses were run on STATA 16.0 (College Station, TX).

Results

Screening Response Rate (Aim 1)

During the study period, 61% (202/303) and 100% (204/204) of eligible youth were screened using the MCAS-R in the psychiatric and behavioral clinics, respectively. This resulted in a total response rate of 80% (406/507). Differences were not examined between respondents and non-respondents; most sociodemographic characteristics were captured in the same survey as the MCAS-R.

MCAS-R Psychometrics and Alignment with Clinician Crisis Ratings (Aim 2)

Internal consistency values for the MCAS-R acuity ($\alpha = .85$), behavioral ($\alpha = .78$), and total ($\alpha = .85$) scores were high. From the 2-factor CFA, the MCAS-R demonstrated strong fit statistics for RMSEA (.08), CFI (.95), TLI (.93), and SRMR (.06). Clinician ratings were available for 93% ($N = 377$) of screened youth. Using a cutoff of ≥ 16 for the MCAS-R total score, 88% of youth were correctly classified. This resulted in an ROC = .86, Sensitivity = 83%, Specificity = 89%, NPV = 96%, and PPV = 64%. The cutoff was determined by the highest ROC value.

MCAS-R Descriptives and Clinician Crisis Ratings (Aim 3)

Table 2 displays descriptive data from the MCAS-R. The most common behavioral challenges, from Section 1, included tantrums, oppositional behavior, physical and verbal aggression, self-injurious behaviors, and property destruction. The top five behaviors that parents identified as most dangerous, in Section 1, are shown in Table 2. Most of these were externalizing problems, except for depression. In the psychiatric and behavioral

Table 2. MCAS-R and clinician crisis scores across sites.

	Psychiatric Clinic	Behavioral Clinic	Total Sample
MCAS-R Section 1 (% moderate/severe)			
Self-injurious behavior	37 (18)	30 (15)	67 (16)
Physical aggression	48 (24)	51 (25)	99 (24)
Verbal aggression	52 (26)	77 (38)	129 (32)
Property destruction	29 (14)	34 (17)	63 (15)
Elopement	19 (10)	24 (12)	43 (11)
Dangerous impulsivity	13 (6)	16 (8)	29 (7)
Depression	39 (19)	39 (19)	78 (19)
Suicidal thoughts/behaviors	6 (3)	11 (5)	17 (4)
Tantrums	70 (35)	85 (42)	155 (38)
Oppositional	65 (32)	11 (35)	76 (33)
Psychosis	14 (7)	11 (5)	25 (6)
Sudden, worrisome change	33 (16)	35 (17)	68 (17)
PICA	9 (5)	8 (4)	17 (4)
No behaviors as moderate/severe	89 (44)	56 (27)	145 (36)
MCAS-R Section 2 (%)			
Physical aggression	19 (17)	38 (26)	57 (22)
Self-injurious behavior	21 (18)	18 (12)	39 (15)
Verbal aggression	11 (10)	21 (14)	32 (12)
Tantrums	14 (12)	14 (9)	28 (11)
Depression	8 (7)	17 (11)	25 (10)
MCAS-R Section 3 (M, SD)			
Acuity subscale	9.1 (5.1)	8.1 (4.9)	8.6 (5.0)
Behavioral efficacy subscale	5.7 (2.5)	5.3 (2.5)	5.5 (2.5)
Total score	14.9 (6.6)	13.4 (6.4)	14.1 (6.5)
MCAS-R cutoff (%)			
0–15 (low risk)	159 (79)	163 (80)	322 (80)
16+ (at risk)	43 (21)	41 (20)	84 (21)
Clinician determination of crisis (%)			
Low risk	153 (83)	152 (78)	305 (81)
High risk	31 (17)	41 (21)	72 (19)

Note: MCAS = Mental Health Crisis Assessment Scale.

clinic, 44% and 27% of parents did not rate any behavior as moderate or severe, respectively.

Roughly one in five youth met the MCAS-R cutoff for crisis. A similar proportion was observed for clinician determination of crisis. Except for verbal aggression, which was more prevalent in the behavioral clinic ($p = .005$), the types of behaviors that lead to crisis (Section 1) were similar across the sites. Additionally, the MCAS-R scores (Section 3) and clinician determination of crisis were not significantly different across sites (all $p > .05$). See [Table 2](#) for details.

Parent and Clinician Satisfaction Ratings (Aim 4)

Response rates for the parent satisfaction survey were 33% ($N = 68$) and 45% ($N = 92$) across the psychiatric and behavioral clinics, respectively. The only significant factors in [Table 1](#) associated with non-response were site (which was lower for the psychiatric clinic) and parental education (both $p < .05$), although the latter was inconsistent (e.g., 33%, 49%, and 29% of those with a High School education, Some College/BA, or Graduate Degree responded, respectively). MCAS-R total scores were not associated with survey response ($p > .05$). Nearly all parents reported that the survey was not “too long” (95%) and/or did not make them “upset” (94%). Most parents felt the MCAS-R helped them communicate concerns with the clinician (73% Yes, 17% Somewhat, and 6% No). No site differences in ratings were present (all $p > .05$).

Six of the seven clinicians responded to the provider survey (86% response rate). All responding clinicians (100%) indicated that the MCAS-R was very/extremely helpful in facilitating communication with the parent and identifying or mitigating safety concerns. One clinician (17%) reported concerns by the parents about the MCAS-R screening project. Their concern was that the survey did not clearly explain the reason behind the screening, and the nature of the questions was exclusively deficit-focused. Slightly more than half (67%) of clinicians reported the MCAS-R never/rarely interrupted clinical flow (33% reported “sometimes”). Clinicians who reported the interruption stated, “some families had other things they needed to discuss” and “it took time from a session.”

All clinicians (100%) reported that the MCAS-R was useful (or very useful) for clinical practice. For instance, clinicians stated having the MCAS-R promoted transparency and shared discussion of concerns. They commented it was valuable for treatment planning as it helped to ensure the focus of treatment was aligned with areas of concern, as identified by the parent. Lastly, clinicians remarked that the MCAS-R was useful

in collaborating with other team members when discussing the need for higher levels of care.

Discussion

This is the first study to examine the utility and feasibility of implementing a mental health crisis screening measure in youth with ASD in the outpatient setting. Most outpatient clinics screen for psychiatric and behavioral problems using measures that assess DSM-5 symptoms. Those measures rarely provide information about whether an individual is experiencing a mental health crisis, which can arise as a byproduct of any psychiatric or behavioral disorder. The MCAS-R provides complementary information on two critical factors, which are not included in routine psychiatric measures, that can guide treatment planning: 1) mental health acuity and 2) perceived parental efficacy in managing their child’s behavior. Hence, the MCAS-R provides a valuable tool to address these domains in the pursuit of detecting high-risk patients. This measure is freely available, quick to administer, is easy to use/ requires low literacy, and is available upon request (by emailing the first and/or last study authors).

Data from this study demonstrated that implementing the MCAS-R as a screening tool was feasible and of perceived benefit to both clinicians and caregivers of youth with ASD. Response rates were high across clinics, and both caregivers and clinicians reported the MCAS-R was helpful in facilitating communication, addressing safety concerns, and treatment planning. While our crisis screening data is consistent with the broader literature, suggesting measurement-based care is valuable to both caregivers and providers (Lewis et al., 2018), a few of the clinicians identified some disruption with clinical flow. This is not surprising considering that the introduction of a new tool and procedure may slow or alter typical practice, as noted by clinicians in this study. Our approach in the psychiatry clinic attempted to minimize interruption during the patient’s appointment by electronically emailing the crisis screening results (in graphical form) to providers before the appointment. Nevertheless, the integration of crisis screening must be tailored to the milieu and flow of each clinic to optimize efficiency for caregivers, staff, and physicians. Unique to the literature, the MCAS-R provides an opportunity for clinicians to explicitly use the term mental health crisis. This allows clinicians to objectively acknowledge severe distress in the patient and/or family while recommending the appropriate clinical course of action.

In each clinic, 20% of the sample met criteria for crisis. The consistency of this estimate is striking given

the differences between location (urban vs. rural), informants (clinician vs. parent), and services (psychiatry vs. behavioral health). This finding is lower than the 32% prevalence of crisis reported in an online sample of youth with ASD (Vasa et al., 2020). The elevated rate may be due to selection bias, where families who were at increased risk for crisis enrolled in the online registry-based study. Ultimately, these data suggest that many youth with ASD who are seeking outpatient mental health care are at risk of crises. Future research is needed to examine the prevalence and characteristics of crises in the ASD population in other settings (e.g., general child psychiatry clinics where individuals may receive care). The use of epidemiologically defined samples is particularly needed.

Clinical Implications

The findings of this study suggest that the MCAS-R holds promise as a screening tool that can be implemented in outpatient ASD clinics. Early identification of crisis could lead to diversion of visits to the emergency room for behavioral escalation, a known issue in ASD (Kalb et al., 2019). If screening is implemented, clinical protocols should be developed to support the children and families who have been identified to be in crisis. In the clinic, this includes having crisis response teams and designated safe spaces available throughout the day. For families, this involves equipping them with safety plans (e.g., Autism Speaks Toolkits), connecting them with local resources (e.g., emergency contact numbers), and providing clinical guidance on how to manage a crisis (for specific recommendations, see Vasa et al., 2020).

At present, no evidence-based crisis interventions exist for families of youth with ASD. Evidence-based behavioral management strategies for youth with ASD can be offered to parents to reduce challenging behavior. This includes both the RUBI (Research Units in Behavioral Intervention) and AIM HI (An Individualized Mental Health Intervention for ASD) programs (Bearss et al., 2015; Brookman-Frazee et al., 2019). Community services can also aid in managing mental health crisis. One successful crisis prevention and intervention program that has been implemented across 13 states is START (Systemic, Treatment, Assessment, Resources, and Treatment; Kalb et al., 2019). START is a life-span, multidisciplinary crisis prevention and intervention program for persons with Intellectual/Developmental Disabilities. START has shown promising outcomes through the provision of 24/7 crisis response services, diagnosis and treatment, cross-systems linkages, and community-based training (Kalb, Beasley et al., 2019).

This study opens several avenues for future research. First, the finding of 20% of youth with ASD in crisis suggests that new intervention models are needed to prevent and treat crisis. Relying on the emergency departments and/or inpatient systems to manage these youth and families is neither affordable, reliable, or acceptable (Kalb et al., 2019). The behavioral intervention models described above are also lengthy and expensive. Thus, brief interventions that can provide parents with immediate tools to prevent and manage crisis behaviors at home are needed. Second, understanding differences in developmental, educational, and mental health trajectories, among youth who have/have not experienced crises, is another important research horizon. This is important in establishing both the predictive validity of the MCAS-R and if new evaluations present with a different, more acute risk profile, than clients who are actively engaged in services (which was the case in the present study). Thirdly, further research is needed to develop self-report tools that will allow us to better understand the perceptions of autistic individuals regarding crisis. Fourth, given the high rates of pediatric mental health crisis in neurotypical children, the MCAS-R could be considered for use in non-ASD populations (Kalb, Stapp et al., 2019). This would require small adaptations of the specific behaviors that constitute a crisis (Section 1 of the MCAS-R). More importantly, validation of the measure in this group is needed. Lastly, given that crisis screening typically occurs in mental health settings, it may be particularly valuable to consider implementing this tool in educational and primary care settings, under the guidance of school psychologists and physicians, to identify children at-risk of crisis who are not receiving mental health care.

The findings should be interpreted in light of the study's strengths and limitations. For strengths, the sample was large, diverse, multisite, and employed multiple informants. In addition, the screening response rate was high, and the findings were novel and important to research and practice. For limitations, data on child characteristics were limited although the purpose of the study was not to identify patient groups at risk but rather to assess the implementation and outcomes of the MCAS-R. Survey response rates were variable across sites and low for the satisfaction survey. Importantly, this study was not independent of clinician bias. Three of the study authors served as clinicians, which may have led to overestimating the value of the crisis screening and influenced the satisfaction survey. The agreement between the MCAS-R and clinician determination of crisis was also not independent, given this study (and the screening) took place in the context of routine clinical care. While a benefit of this

approach is that the findings reflect real-world practice, it is partially offset by not having true independence between clinician and parental observation. Lastly, while the samples were diverse, the results may not generalize to other settings.

Conclusions

In summary, this study found that the MCAS-R is a useful, feasible, and accurate parent-report measure to identify youth at risk of crisis. Both parents and clinicians found the MCAS-R to be acceptable and beneficial in the clinical setting. Using this measure, one in five youth with ASD receiving treatment in an outpatient setting were at risk of a mental health crisis. Greater work is needed to understand effective ways to support these youth and their families.

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References

- Allen, M., Forster, P., Zealberg, J., & Currier, G. (2002). *Report and recommendations regarding psychiatric emergency and crisis services*. American Psychiatric Association. Retrieved April 21, 2021, from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.473.167&rep=rep1&type=pdf>
- Aman, M. G., Singh, N. N., Stewart, A. W., & Field, C. J. (1985). The aberrant behavior checklist: A behavior rating scale for the assessment of treatment effects. *American Journal of Mental Deficiency, 89*(5), 485–491.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). <https://doi.org/10.1176/appi.books.9780890425596>
- Bearss, K., Johnson, C., Smith, T., Lecavalier, L., Swiezy, N., Aman, M., McAdam, D. B., Butter, E., Stillitano, C., Minshawi, N., Sukhodolsky, D. G., Mruzek, D. W., Turner, K., Neal, T., Hallett, V., Mulick, J. A., Green, B., Handen, B., Deng, Y., & Scahill, L. (2015). Effect of parent training vs parent education on behavioral problems in children with autism spectrum disorder: A randomized clinical trial. *Jama, 313*(15), 1524–1533. <https://doi.org/10.1001/jama.2015.3150>
- Bengelsdorf, H., Levy, L. E., Emerson, R. L., & Barile, F. A. (1984). A crisis triage rating scale: Brief dispositional assessment of patients at risk for hospitalization. *Journal of Nervous and Mental Disease, 172*(7), 424–430. <https://doi.org/10.1097/00005053-198407000-00009>
- Brookman-Frazee, L., Roesch, S., Chlebowski, C., Baker-Ericzen, M., & Ganger, W. (2019). Effectiveness of training therapists to deliver an individualized mental health intervention for children with ASD in publicly funded mental health services: A cluster randomized clinical trial. *JAMA psychiatry, 76*(6), 574–583. <https://doi.org/10.1001/jamapsychiatry.2019.0011>
- Curran, P. J., West, S. G., & Finch, J. F. (1996). The robustness of test statistics to nonnormality and specification error in confirmatory factor analysis. *Psychological Methods, 1*(1), 16. <https://doi.org/10.1037/1082-989X.1.1.16>
- Hamm, M. P., Osmond, M., Curran, J., Scott, S., Ali, S., Hartling, L., Gokiert, R., Cappelli, M., Hnatko, G., & Newton, A. S. (2010). A systematic review of crisis interventions used in the emergency department: Recommendations for pediatric care and research. *Pediatric Emergency Care, 26*(12), 952–962. <https://doi.org/10.1097/PEC.0b013e3181fe9211>
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: a Multidisciplinary Journal, 6*(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Kalb, L. G., Beasley, J., Caoili, A., & Klein, A. (2019). Improvement in mental health outcomes and caregiver service experiences associated with the START program. *American Journal on Intellectual and Developmental Disabilities, 124*(1), 25–34. <https://doi.org/10.1352/1944-7558-124.1.25>
- Kalb, L. G., Hagopian, L. P., Gross, A. L., & Vasa, R. A. (2018). Psychometric characteristics of the mental health crisis assessment scale in youth with autism spectrum disorder. *Journal of Child Psychology and Psychiatry, 59*(1), 48–56. <https://doi.org/10.1111/jcpp.12748>
- Kalb, L. G., Stapp, E. K., Ballard, E. D., Hologue, C., Keefer, A., & Riley, A. (2019). Trends in psychiatric emergency department visits among youth and young adults in the US. *Pediatrics, 143*(4). <https://doi.org/10.1542/peds.2018-2192>
- Kalb, L. G., Stuart, E. A., Mandell, D. S., Olfson, M., & Vasa, R. A. (2017). Management of mental health crises among youths with and without ASD: A national survey of child psychiatrists. *Psychiatric Services, 68*(10), 1039–1045. <https://doi.org/10.1176/appi.ps.201600332>
- Kalb, L. G., Stuart, E. A., & Vasa, R. A. (2019). Characteristics of psychiatric emergency department use among privately insured adolescents with autism spectrum disorder. *Autism, 23*(3), 566–573. <https://doi.org/10.1177/1362361317749951>
- Kiely, B., Migdal, T. R., Vettam, S., Adesman, A., & Martinuzzi, A. (2016). Prevalence and correlates of elopement in a nationally representative sample of children with developmental disabilities in the United States. *PloS one, 11*(2), e0148337. <https://doi.org/10.1371/journal.pone.0148337>
- Lai, M. C., Kasse, C., Besney, R., Bonato, S., Hull, L., Mandy, W., Szatmari, P., & Ameis, S. H. (2019). Prevalence of co-occurring mental health diagnoses in the autism population: A systematic review and meta-analysis. *The Lancet Psychiatry, 6*(10), 819–829. [https://doi.org/10.1016/S2215-0366\(19\)30289-5](https://doi.org/10.1016/S2215-0366(19)30289-5)
- Laracy, S. D., Hojniski, R. L., & Dever, B. V. (2016). Assessing the classification accuracy of early numeracy curriculum-based

- measures using receiver operating characteristic curve analysis. *Assessment for Effective Intervention*, 41(3), 172–183. <https://doi.org/10.1177/1534508415621542>
- Lewis, C. C., Puspitasari, A., Boyd, M. R., Scott, K., Marriott, B. R., Hoffman, M., Navarro, E., & Kassab, H. (2018). Implementing measurement based care in community mental health: A description of tailored and standardized methods. *BMC Research Notes*, 11(1), 1–6. <https://doi.org/10.1186/s13104-018-3193-0>
- Logan, S. L., Carpenter, L., Leslie, R. S., Garrett-Mayer, E., Hunt, K. J., Charles, J., & Nicholas, J. S. (2015). Aberrant behaviors and co-occurring conditions as predictors of psychotropic polypharmacy among children with autism spectrum disorders. *Journal of Child and Adolescent Psychopharmacology*, 25(4), 323–336. <https://doi.org/10.1089/cap.2013.0119>
- Lord, C., Luyster, R. J., Gotham, K., & Guthrie, W. (2012). *Autism diagnostic observation schedule, second edition (ADOS-2) manual (Part II): Toddler module*. Western Psychological Services.
- Mazefsky, C. A., Yu, L., White, S. W., Siegel, M., & Pillkonis, P. A. (2018). The emotion dysregulation inventory: Psychometric properties and item response theory calibration in an autism spectrum disorder sample. *Autism Research*, 11(6), 928–941. <https://doi.org/10.1002/aur.1947>
- Molina-Lo'pez, A., Cruz-Islas, J. B., Palma-Corte's, M., GuizarSa'nchez, D. P., Garfias-Rau, C. Y., Ontiveros-Urbe, M. P., & Fresa'n-Orellana, A. (2016). Validity and reliability of a novel color-risk psychiatric triage in a psychiatric emergency department. *BMC Psychiatry*, 16(1), 30. <https://doi.org/10.1186/s12888-016-0727-7>
- O'Donoghue, E. M., Pogge, D. L., & Harvey, P. D. (2020). The impact of intellectual disability and autism spectrum disorder on restraint and seclusion in pre-adolescent psychiatric inpatients. *Journal of Mental Health Research in Intellectual Disabilities*, 13(2), 86–109. <https://doi.org/10.1080/19315864.2020.1750742>
- Simonoff, E., Pickles, A., Charman, T., Chandler, S., Loucas, T., & Baird, G. (2008). Psychiatric disorders in children with autism spectrum disorders: Prevalence, comorbidity, and associated factors in a population-derived sample. *Journal of the American Academy of Child and Adolescent Psychiatry*, 47(8), 921–929. <https://doi.org/10.1097/CHI.0b013e318179964f>
- Stokoe, N. (2012). *Enhancing the appraisal of acute mental health crisis: The crisis risk and adaptive functioning tool (CRAFT)* [Dissertation Abstracts International]. The Sciences and Engineering.
- Vasa, R. A., Hagopian, L., & Kalb, L. G. (2020). Investigating mental health crisis in youth with autism spectrum disorder. *Autism Research*, 13(1), 112–121. <https://doi.org/10.1002/aur.2224>
- Weiss, J. A., & Lunskey, Y. (2011). The brief family distress scale: A measure of crisis in caregivers of individuals with autism spectrum disorders. *Journal of Child and Family Studies*, 20(4), 521–528. <https://doi.org/10.1007/s10826-010-9419-y>
- Weiss, J. A., Wingsiong, A., & Lunskey, Y. (2014). Defining crisis in families of individuals with autism spectrum disorders. *Autism: the International Journal of Research and Practice*, 18(8), 985–995. <https://doi.org/10.1177/1362361313508024>
- White, S. E., McMorris, C., Weiss, J. A., & Lunskey, Y. (2012). The experience of crisis in families of individuals with autism spectrum disorder across the lifespan. *Journal of Child and Family Studies*, 21(3), 457–465. <https://doi.org/10.1007/s10826-011-9499-3>