

# Evaluating the HEADS-ED Screening Tool in a Hospital-Based Mental Health and Addictions Central Referral Intake System: A Prospective Cohort Study

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## ABSTRACT

**OBJECTIVES:** We evaluated the use of a mental health (MH) screening tool in a hospital-based centralized MH referral telephonic intake process. The tool is used to guide psychosocial screening in several domains: home; education; activities and peers; drugs and alcohol; suicidality; emotions, thoughts, and behaviors; and discharge resources (HEADS-ED). We wanted to understand the use of the tool to guide next step in care decision-making over the telephone.

**METHODS:** Intake workers used the HEADS-ED tool to guide the assessment processes, identified areas of MH need, and made decisions about next step in care. We completed a retrospective chart review of all callers to the intake system over 4 months to gather initial decision at intake and subsequent steps in treatment.  $\chi^2$  and analysis of variance tests were used to examine differences between HEADS-ED scores and next step in care.

**RESULTS:** A total of 674 patients aged 3 to 19 years (mean age = 11.7 years, SD = 0.6; girls = 50.0%) called for services. Significant mean differences were found on total HEADS-ED scores between treatment options ( $F_{4,641} = 75.76$ ;  $P < .001$ ). Decision validity indicated that 86% ( $n = 506$  of 587) of initial referrals matched treatments that were actually received. Uptake of the tool was 100%, and interrater reliability indicated strong agreement between raters (intraclass correlation coefficient = 0.82;  $P < .001$ ).

**CONCLUSIONS:** With our results, we support the use of the HEADS-ED tool in a telephone-based MH intake system to help guide the initial assessment and inform decision-making about fit of next step in care, both within the health center-based MH system and in the community.

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In recent comprehensive estimates of the prevalence of mental health (MH) disorders in children and youth ages 4 to 17 years, it is suggested that 12.6% have experienced clinically significant disorders that required intervention to reduce impairment associated with distress and symptom presentation.<sup>1</sup> When children and youth do not receive the MH care they require, the impact on their healthy development trajectory leads to significant complications.<sup>2-4</sup> Despite our understanding of the impact, <50% of youth and only 1 in 6 children with MH disorders receive specialized MH care.<sup>5,6</sup>

Wait times for receiving MH services are often identified as 1 reason for the significant hurdle to care. Processes related to accessing formal MH care are often unclear, cumbersome, and may not be built in a user-friendly manner for those attempting to access care. Delays to care often begin at intake, when the clients' needs are determined through preliminary assessments conducted by qualified intake workers. The intake process within MH systems requires assessment tools that are easy to use, capture the right information required to facilitate decision-making, and add value to each step of a treatment path for patients and families.<sup>7,8</sup> As demands for child and adolescent MH care and resources continue to increase, intake screening tools are needed to (1) make MH assessment and system navigation easier, (2) reduce the burden of repeated assessments on families, (3) improve communication between health care providers, and (4) support families to access the right care at the right time.

The HEADS-ED tool is an easy-to-use, brief, communimetric-based tool<sup>9,10</sup> that is used to guide the clinician psychosocial assessment in the areas of home; education; activities and peers; drugs and alcohol; suicidality; emotions, thoughts, and behaviors; and discharge resources (available at [www.heads-ed.com](http://www.heads-ed.com)).<sup>11</sup> Each item is rated as a score of 0 (no action needed), 1 (action needed but not immediate), or 2 (immediate action needed). The HEADS-ED tool has been used to help guide the referral process and for discussing the clinical needs of patients

between health care providers using a common action-oriented language.<sup>11</sup> The HEADS-ED tool has demonstrated good validity (concurrent, predictive, use, and decision validity) and interrater reliability in the emergency department (ED) setting.<sup>11,12</sup> This tool was also recommended in 2 recent systematic reviews for its strong psychometric properties and ease of use for screening MH and addictions concerns in the ED.<sup>13,14</sup> and is also being used across 4 Ontario EDs as part of an ED MH clinical pathway evaluation.<sup>15,16</sup>

Our objective in this study was to evaluate (1) the use and decision validity of the HEADS-ED tool in guiding the decision-making process and (2) the interrater reliability of the HEADS-ED MH screening tool within a hospital-based centralized MH referral telephonic intake system using the principles of communimetrics.<sup>9,10</sup> We expected that the total scores on the HEADS-ED tool would differ between next steps in care and that variability in functional impact of MH symptoms on their presentation would be demonstrated between next step in care options.

## METHODS

### Setting

The Izaak Walton Killam Health Centre is a health center for women and children in Halifax, Nova Scotia. It provides MH services for the metropolitan area (population 403 390) for children and youth (ages 0–18 years) with moderate to severe symptom presentation and more intensive day, overnight, and inpatient services for children and youth from across the province, including the 4 Eastern Canadian Maritime Provinces (population 2 333 322).<sup>17</sup> The Central Referral intake system is telephone based and serves as the single entry for nonemergency referrals. Referrals are welcomed by self-referral (youth or caregiver), or physicians and provincial eligibility criteria are used to inform decision-making. Within the Central Referral system, access navigators answer the phone and either redirect families to services in the community or complete the intake process to inform next step in care within the MH and addiction program.

Three outpatient community-based ambulatory teams use the Choice and Partnership Approach<sup>18,19</sup> as their model for service delivery. In this model, the first appointment with a clinician focuses on understanding the presenting problem, setting goals for treatment, and making a decision about appropriate next step in care. Priority appointments are reserved for patients with high acuity of symptoms. After the first appointment, clients may leave the formal system and pursue self-management with recommendations of psychoeducation and community-based services or be booked to return for intervention, which may include individual psychotherapies or group treatments as appropriate. A decision is made at the first appointment as to whether clients presenting acuity require priority or regular intervention steps of care (see Fig 1).

## Participants

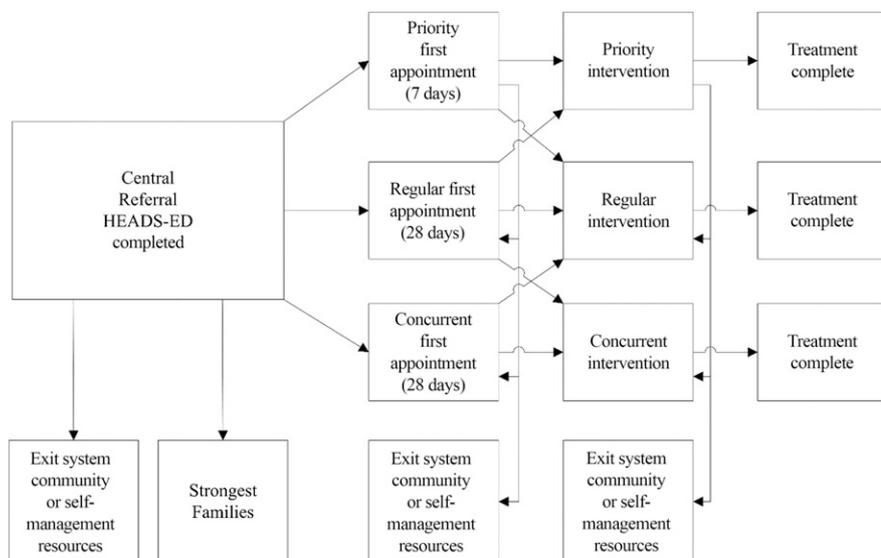
All caregivers or youth who contacted Central Referral themselves were included in the study. This study was approved by the hospital's research ethics board.

## Measures: The HEADS-ED MH Screening Tool

The HEADS-ED, which has been adapted from the HEADS (home; education and employment; activities; drugs; sexuality) interview,<sup>20,21</sup> is a communimetric tool that is used to capture key information and identify areas of need across 7 variables: home; education; activities and peers; drugs and alcohol; suicidality; emotions, thoughts, and behaviors; and discharge resources. Three nonarbitrary ordinal categories are used to indicate level of action required: no action needed (0), action needed but not immediately,<sup>1</sup> and immediate action required.<sup>2,11,12</sup> The screening tool provides a guided clinical severity and scoring system to aid in decision-making of appropriate next step of care.<sup>11</sup> A higher total score indicates a greater need for immediate action.

## Procedure

All referral calls between February 1, 2016, and May 31, 2016, were included in the analyses. The standard intake practice within Central Referral involved the access



**FIGURE 1** Flow of steps of care. Reference to days indicates the standard number of days between referral to expected contact.

navigators completing the HEADS-ED tool with the caller on the phone. Access Navigators used the HEADS-ED tool as a method for standardizing the collection of collateral information about a patient to inform their decision-making related to clinical “fit” of the required next step in MH and addictions care.

Decision on next step in care included the following 5 treatment options on the basis of the patient’s functional impairment: (1) recommendation to access appropriate community resources without formal MH system involvement, (2) referral to a distance-based telephone coaching parenting treatment called Strongest Families, (3) booked regular initial appointment with an MH clinician (regular appointment seen within 28 days for moderate MH and/or addiction symptom

report), (4) booked for priority initial appointment with an MH clinician (priority appointment seen within 7 days because of a high level of symptom acuity on report), or (5) concurrent appointment (seen by a clinician with expertise in substance misuse because of a high level of concurrent symptomatology).

A trained research assistant used electronic patient files to gather steps in treatment the patient received after attending the first appointment. The possible next steps in treatment were categorized in a standard manner by using common definitions of the next step in care options. The research assistant reviewed the electronic patient chart and completed the HEADS-ED for a random set of 10% of the patients to assess interrater reliability.

## Data Analysis

Data were analyzed by using IBM SPSS Statistics version 19.0 (IBM SPSS Statistics, IBM Corporation).<sup>22</sup> Missing data were evaluated through sensitivity analyses. Descriptive statistics were obtained by frequency analysis and measures of central tendency. Usage validity was used to assess how useful the HEADS-ED measure was and encompassed several things such as uptake, as measured by the proportion of clients that had a HEADS-ED completed by an access navigator, and relationship to subsequent action.<sup>10</sup> Relationship to subsequent action was assessed by (1)  $\chi^2$  analyses to examine the proportion of patients recommended to different outcomes, (2) a 1-way analysis of variance to determine if there were mean score differences on each of the HEADS-ED items by service type, and (3)  $\chi^2$  analyses to compare the initial decision made at point of referral to actual treatment received. Referrals to specialized care ( $n = 27$ ) were not included in these analyses because these referrals do not originate with Central Referral. Intraclass correlations were used to assess interrater reliability between the access navigators’ ratings and the research assistant.

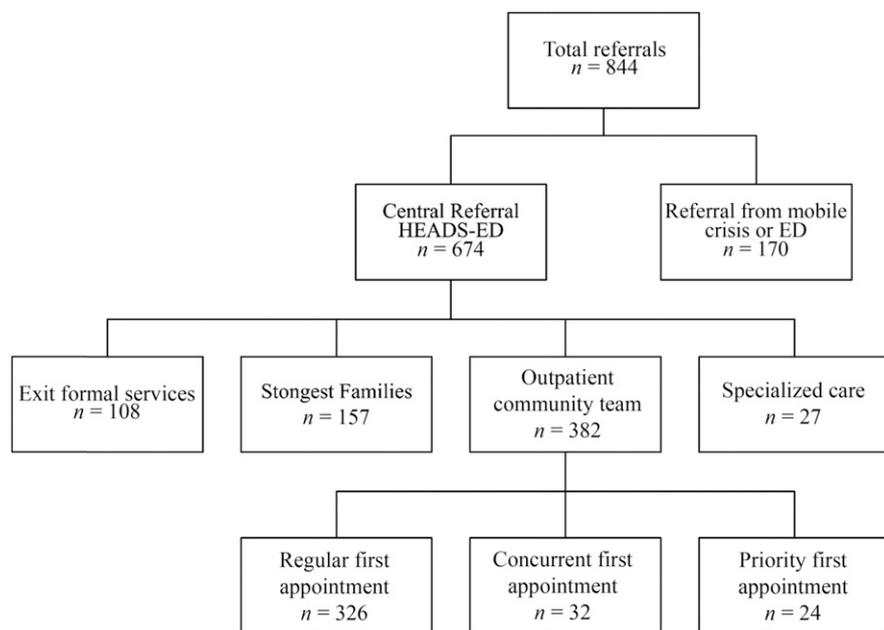
## RESULTS

A total of 844 patients were referred by phone to the Central Referral, and access navigators completed the HEADS-ED tool for 674 potential patients (80% of total sample). See Table 1 for demographics. The 20% ( $n = 170$ ) who did not have a HEADS-ED completed had bypassed the access navigators’ intake telephone interview because they were booked directly for an

**TABLE 1** Demographic and Clinical Characteristics of the Total Sample and by Age Groupings

	Total ( $N = 674$ )	0–5 y ( $n = 60$ )	6–12 y ( $n = 314$ )	$\geq 13$ y ( $n = 300$ )
Age at time of referral in y, mean (SD)	11.7 (0.6)	4.6 (0.6)	9.0 (1.9)	15.6 (1.7)
Missing, $n$ (%)	15 (2.2)	15 (25)	0	0
Sex, $n$ (%)				
Female	337 (50.0)	21 (35.0)	123 (39.2)	193 (64.3)
Male	335 (49.7)	37 (61.7)	191 (60.8)	107 (35.7)
Missing	2 (0.3)	2 (3.3)	0	0
HEADS-ED total score, mean (SD)	3.8 (1.8)	2.8 (1.5)	3.4 (1.4)	4.4 (2.0)

Total is the number of referrals that received a HEADS-ED at intake; 170 were not applicable.



**FIGURE 2** Distribution of referrals received in Central Referral intake over a 4-month period.

initial appointment with the outpatient teams from the mobile crisis service or ED. The 4% ( $n = 27$ ) who were referred to specialized care clinics were not included in subsequent analyses because the HEADS-ED score was not the definitive criteria for referral, and other information was used to inform this referral pathway (eg, body weight for referral to eating disorders clinic; see Fig 2).

### Usage Validity

We examined the usage validity<sup>10</sup> of the HEADS-ED tool by (1) usage penetration and (2) relationship to subsequent action by determining how well the tool corresponded with the next step in care received. Usage penetration was demonstrated by the proportion of clients in which the HEADS-ED tool was used by the access navigators, which was 100% uptake ( $N = 674$ ). In Table 2, we present the frequency distribution of the HEADS-ED items by action level for the total sample, and in Table 3, we present the proportion of patients referred for next step in care by HEADS-ED action level. By using  $\chi^2$  analyses, significant associations were found between treatment options and action levels on each item of the HEADS-ED (see Table 3). A 1-way between-subjects

analysis of variance test was conducted to compare the mean total HEADS-ED score for each treatment option ( $F_{4,641} = 75.76$ ;  $P < .001$ ), which indicated an overall statistically significant difference in mean HEADS-ED scores for the treatment groups. Post hoc analyses were used to compare each level of intervention to the mean score of those in the lower level of intervention (ie, concurrent to regular first appointment, priority to regular first appointment, regular first appointment to Strongest Families, Strongest Families to exit) by using the least significant difference test. Significant differences between each level of treatment were obtained.

### Decision Validity

Decision validity was reported in Table 4, which compared the initial referral decision to the actual service received. The concordance rate between all matched services was 86.2% ( $n = 506$  of 587) or 78.2% ( $n = 506$  of 647, if no shows and cancelled appointments were included in the denominator). The biggest shift between the original decision made and the action taken occurred with those referred to the Strongest Families program. Overall, 56.7% ( $n = 89$  of 157 referred) attended the program, and 42.7% exited ( $n = 67$  of 157; ie, did not feel they required system-level care after speaking to an access navigator) and did not receive treatment from this service. The no-show rate (eg, those who had a booked appointment and did not show up) for the first appointment was 5.4% ( $n = 35$  of 647), and 3.9% ( $n = 25$  of 647) called to cancel the appointment before arrival.

### Interrater Reliability

The overall interrater reliability analysis of the HEADS-ED tool between the original score assigned by 1 of the 5 access navigators and the research assistant's reliability scores indicated strong agreement ( $r = 0.82$ ; average measures the intraclass correlation coefficient [ICC] ICC,  $P < .001$ ). The HEADS-ED items that revealed highest interrater reliability on the basis of 70 ratings were as follows: drugs and alcohol (ICC = 0.964,  $P < .001$ ), followed by suicidality (ICC = 0.863;  $P < .001$ ), education (ICC = 0.773;  $P < .001$ ), activities and peers (ICC = 0.611;  $P < .001$ ), home (ICC = 0.364;  $P = .031$ ), discharge

**TABLE 2** Frequency Distribution of the HEADS-ED Items by Action Level for the Total Sample ( $N = 674$ )

	0: No Action Needed	1: Needs Action but Not Immediately	2: Needs Immediate Action
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Home	454 (67.4)	191 (28.3)	29 (4.3)
Education	412 (61.1)	214 (31.8)	48 (7.1)
Activities and peers	421 (62.5)	239 (35.5)	14 (2.1)
Drugs and alcohol	611 (90.7)	32 (4.7)	31 (4.6)
Suicidality	579 (85.9)	83 (12.3)	12 (1.8)
Emotions and behaviors	65 (9.6)	527 (78.2)	82 (12.2)
Discharge resources	21 (3.1)	474 (70.3)	179 (26.6)

**TABLE 3** Proportion of Patients Referred for Next Step in Care by Level of HEADS-ED

	Rating	Total	Exit	Strongest Families	Regular First Appointment	Priority First Appointment	Concurrent First Appointment	$\chi^2$ Significance
<i>N/n</i> (%)		647 (100)	108 (16.7)	157 (24.3)	326 (50.4)	24 (03.7)	32 (4.9)	
Home, <i>n</i> (%)								***
Supportive	0	432 (66.9)	83 (13.5)	116 (18.9)	207 (33.7)	12 (2.0)	14 (3.2)	
Conflicts	1	185 (28.6)	18 (2.9)	39 (6.4)	106 (16.3)	11 (1.8)	12 (6.5)	
Chaotic and/or dysfunctional	2	29 (4.5)	7 (1.1)	2 (0.3)	13 (2.1)	1 (0.2)	6 (20.7)	
Education, <i>n</i> (%)								***
On track	0	394 (61.0)	86 (14.0)	112 (18.2)	182 (28.1)	8 (1.3)	7 (1.8)	
Grades dropping	1	205 (31.7)	17 (2.8)	44 (7.2)	122 (19.9)	10 (1.6)	12 (5.9)	
Failing and/or not attending school	2	47 (7.3)	5 (0.8)	1 (0.6)	22 (3.6)	6 (1.0)	13 (27.7)	
Activities and peers, <i>n</i> (%)								***
No change	0	401 (62.0)	96 (15.6)	111 (18.1)	179 (27.7)	8 (01.3)	8 (2)	
Reduced	1	232 (35.9)	10 (1.6)	46 (7.5)	143 (23.3)	11 (1.8)	22 (9.5)	
Withdrawn	2	13 (2.0)	2 (0.3)	0 (0.0)	4 (0.7)	5 (0.8)	2 (15.4)	
Drugs and alcohol, <i>n</i> (%)								***
None or infrequent	0	587 (90.9)	101 (16.4)	157 (25.6)	308 (47.6)	20 (3.3)	2 (0.3)	
Occasional	1	29 (4.4)	4 (0.7)	0 (0.0)	14 (2.3)	3 (0.5)	8 (27.6)	
Frequent and/or daily	2	30 (4.6)	3 (0.5)	0 (0.0)	4 (0.7)	1 (0.2)	22 (73.3)	
Suicidality, <i>n</i> (%)								***
No thoughts	0	558 (86.3)	105 (17.1)	149 (24.3)	270 (41.7)	9 (1.5)	26 (2.7)	
Ideation	1	77 (11.9)	3 (0.5)	8 (1.3)	52 (8.5)	10 (1.6)	4 (5.2)	
Plan or gesture	2	11 (1.7)	0 (0.0)	0 (0.0)	4 (0.7)	5 (0.8)	2 (18.2)	
Emotions and behaviors, <i>n</i> (%)								—
Mildly anxious, sad and/or acting out	0	64 (9.9)	42 (6.8)	12 (2.0)	9 (1.5)	0 (0.0)	1 (1.6)	
Moderately anxious, sad, and/or acting out	1	503 (77.9)	59 (9.6)	136 (22.1)	269 (41.5)	13 (2.1)	27 (5.4)	
Significantly distressed, unable to function, and/or out of control	2	79 (12.2)	7 (1.1)	9 (1.5)	48 (7.8)	11 (1.8)	4 (5.1)	
Discharge resources, <i>n</i> (%)								—
Ongoing and/or well-connected	0	20 (3.1)	17 (2.8)	2 (0.3)	1 (0.2)	0 (0)	0 (0)	
Some and/or not meeting needs	1	453 (70.1)	58 (9.4)	113 (18.4)	241 (37.2)	16 (2.6)	26 (5.7)	
None and/or on waitlist	2	173 (26.8)	33 (5.4)	42 (6.8)	84 (13.7)	8 (1.3)	6 (3.5)	
Total score, mean (SD)	—	3.79 (1.80)	2.62 (1.72)	3.15 (1.10)**	4.0 (1.51)***	6.12 (2.01)***	6.91 (1.59)***	

\*\*  $P < .01$ ; \*\*\*  $P < .001$ .

**TABLE 4** Decision Validity Table

Initial Decision Made at Referral	Services Patient Actually Received After Intake					Other Outcomes			Total
	Exit	Strongest Families	Regular First Appointment	Priority First Appointment	Concurrent First Appointment	No Show	Cancelled	Other Care	
Exit	107	—	1	—	—	—	—	—	108
Strongest families	67	89	1	—	—	—	—	—	157
Regular first appointment	—	—	265	1	—	30	20	10	326
Priority first appointment	—	—	—	23	—	1	—	—	24
Concurrent first appointment	—	—	—	—	22	4	5	1	32
Total	174	89	267	24	22	35	25	11	647

—, not applicable.

resources (ICC = 0.302;  $P = .069$ ), and emotions and behaviors (ICC = 0.292;  $P = .077$ ).

## DISCUSSION

With the results of this study, we provide evidence of the usefulness of the HEADS-ED tool for use in an MH and addictions intake setting to guide standardized assessment of youth seeking MH care. Access navigators used the HEADS-ED tool 100% of the time over 4 months to help guide their MH assessment and assist with matching their patient's identified needs with the next steps in care. This rate is higher than what has been cited for other intake tools at 80% completion,<sup>23</sup> possibly because of ease of use<sup>14</sup> and providing sufficient information to make decisions about fit of care. In addition, using the HEADS-ED as an intake tool assisted access navigators with matching youth with services that met their identified needs because there was a high concordance rate between the recommended service at intake for next step in care and with obtaining the recommended service.

In previous research, authors have supported the predictive validity of the tool in an ED setting.<sup>11,12</sup> The results of this work have revealed the usefulness of this tool for the centralized telephone-based MH intake system. The mean total scores on the HEADS-ED were significantly higher for children and youth who were referred for care within the system and were different from those who were provided resources to support self-management or were recommended to seek support from community-based interventions. In addition, those youth who were recommended to be

scheduled for priority appointments because of their acuity of symptom presentation had higher HEADS-ED mean scores than those booked for regular first appointments. The results further reveal the validity of the tool for intake settings in identifying the level of actionable need of MH symptoms, which helped navigators make informed decisions about appropriate patient disposition.

As anticipated, children and youth who were most functionally impacted in multiple domains of the HEADS-ED assessment were those who came into the formal system for MH care. Matching the fit of the intensity of service with the severity of the patient's symptoms and level of functioning is the cornerstone of a stepped-care approach and is empirically supported.<sup>24–26</sup> Using the HEADS-ED tool within an intake system facilitated decision-making related to the “right” step of care, as is recommended within the National Institute for Health and Care Excellence guidelines.<sup>27</sup>

The reliability between the access navigators' scores and the research assistant was strong for areas concerning drugs and alcohol, suicidality, education, activities and peers, and home. Agreement in ratings for emotions and behaviors and discharge resources was not as high, possibly because of access navigators reporting a hesitation to apply a rating of 2 for symptoms captured within the emotions category if the wait for an appointment felt too far off to meet symptom need. To improve agreement among the access navigators' scoring on needs that require nonimmediate or immediate action, we recommend that the

label for the score of 2 be expanded to include a description of the functional impact (ie, mild or moderate to severe). This would capture the difference in practice associated with an intake system or a general practitioner's office, which is different from decision-making in the ED setting where access to care can be immediately responsive. Ongoing interrater reliability checks will further support continuous improvement in the use of this tool between practitioners.

A limitation of this study is that our sample is from 1 site within a universal health care system, and results may not generalize to other settings and health care systems. In addition, the HEADS-ED tool was originally validated with children and youth ages 6 to 18 years old.<sup>11,12</sup> In this sample, the tool was used for those seeking care from 0 to 18 years old, and ~9% of our sample was seeking services for children from 0 to 5 years old. Given that general MH screening tools for this age range are limited, the results of this study will add to that current body of literature.

To create a smooth continuum of MH and addictions service delivery, interventions offered to families should be necessary, and the tasks that navigators invest time and resources into must be value added to the patient's and family's experience of accessing services. In the results of this work, our assertion is supported that the HEADS-ED tool can be used to assist in the provision of a higher standard of care by facilitating improved clinical decision-making. Identifying the needs of patients who require action or the degree of functional impairment allows for better matching of patients to clinical services

that meet their identified needs at the point of entry into an MH service. Early identification and timely matching needs may facilitate the provision of high-quality care by reducing wait times for care, increasing fit of service to treatment needs, reducing unnecessary interventions, and improving the patient's and family's treatment outcomes and their experience with the care they receive. Matching patient needs with the services that meet their needs is important to ensure families are not waiting for services that are inappropriate for their level of need and that they are not extending the wait for others. Expanded use of this HEADS-ED tool will help to facilitate timely access to MH services, therefore ensuring the right level of care is provided at the right time.

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