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The CHILD Intervention for Living Drug-Free Comprehensive Assessment of Risk, Resilience, and Experience (CHILD CARRE) Measure: Initial Findings

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ABSTRACT

This paper summarizes the development and evaluation of an assessment instrument for children ages 7–12. The CHILD CARRE measure is a semi-structured interview with 7 domains. Children from the USA and Argentina ($N = 134$) completed baseline and follow-up assessments. Substance use occurred at an average age of 8. Almost 33% of the children were taking medications for medical issues, more than 50% of them said that medical problem gets in the way of doing things they like to do and almost 64% of the children stated that they would like to feel better. On average, children completed third grade in school, 56% of them knew how to read and 26% of the children started making money at age 8. Most children (74%) saw someone drunk or high and 23% of children reported alcohol or psychoactive substance use. Among these children using substances, such substance use occurred at an average age of 8, and in the past 30 days they used these substances an average for 5 days. The rating of level of risk on the part of the interviewer placed these children in the “risky” to “very risky” categories. Most children reported seeing their family members smoking (83%) or using alcohol (67%), and 49% reported seeing their family members high on drugs. Few children (10%) had conflicts with the law, while 46% of their family members had legal problems. Some children (30%) reported having serious problems getting along with family members, neighbors, or friends. These results suggest that this measure can serve as the first comprehensive measure to assess multiple life domains for young children at risk for or using psychoactive substances.


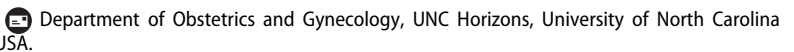
KEYWORDS


Children substance use; drug/alcohol use; family/social relationships; legal status; physical health; psychiatric status; school and social support status

Introduction

Alcohol, tobacco, and other psychoactive substance use often starts at an early age among children who live in difficult life circumstances (Morello et al., 2017). For example, in Argentina children less than 13 years of age reported alcohol (32%), tobacco (10%), and illegal substance use (8%) once in their lifetimes. Momand and colleagues found that both younger (i.e. 4–7 years of age) and older (i.e. 8–18 years of age) children in Afghanistan entering substance use treatment had widespread psychological and social problems that could be considered serious (Momand et al., 2017). Embleton and colleagues, on the basis of

their systematic review of the epidemiology of substance use among children in resource-constrained settings, estimated that among children in vulnerable conditions, such as street circumstances, 47% reported use of inhalants, 44% tobacco, 41% alcohol, 31% marijuana, and 7% cocaine (Embleton et al., 2013). In the USA, 4.1% (approximately 1 million: 1 in 24 adolescents) needed treatment for a substance use disorder in 2017 (Substance Abuse & Mental Health Services Administration, 2018). Research suggests that only 4% of adolescents with an opioid use disorder perceived the need for treatment (Wu et al., 2011). While validated tools exist for adolescent screening and assessment, such tools are

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lacking for children under 12 years of age (Brodey et al., 2005; Colica et al., 2019; Shenoj et al., 2019). The extent to which children 12 and younger use psychoactive substances is limited, because they are excluded from a national survey on substance use and health as well as from the overall adolescent treatment system (where the starting age for treatment is 13 years of age) (Substance Abuse & Mental Health Services Administration, 2018). A survey of adults admitted to treatment for substance use disorders in the USA showed that 10.2% reported substance use initiation at age 11 or younger (Substance Abuse and Mental Health Services Administration, 2018). Further, a literature search suggests that studies of child substance use in the USA was largely focused on child cannabis and opioid exposure. For example, for cannabis, the number of cannabis-related calls to poison control centers for children increased as commercial medical and recreational cannabis use expanded (Thomas et al., 2019; Wang et al., 2016; Washington Poison Center, 2017; Whitehill et al., 2019). Adolescent urgent care and emergency department visits related to cannabis increased between 2005 and 2015 as cannabis laws became more liberal (Wang et al., 2018). For opioids, a number of states reported between 2000 and 2015, 188,468 cases of child or adolescent prescription opioid exposure being reported to poison control centers (Allen et al., 2017). Moreover, between 1997 and 2012 there was a noted increase in pediatric hospitalizations for opioid poisonings (Gaither et al., 2016). Thus, it is possible that there are many US children younger than 13 who are exposed to, experimenting with, or actively using psychoactive substances.

While the incidence and prevalence of child substance use disorders is not fully known, there are clearly some children who are in need of treatment. As such, a system of treatment needs to include the conduct of a systematic and comprehensive assessment of the patient, both at treatment entry and throughout the course of treatment. To that end, treatment providers worldwide where child substance use is a growing concern are faced with a range of daunting challenges presented by their patients on multiple levels—individual, familial, social, and cultural.

Providers face a range of individual child needs that requires responses from multiple agencies that must be coordinated and actively managed over the course of treatment. Perhaps most challenging issue is how to determine not only a child's level of substance use severity but also the constellation of interpersonal, family and social factors that might either impair or facilitate the treatment process.

Because substance use impairs different domains of an adolescent's and adult's life, substance use disorders are best understood by examining multiple aspects of an individual's life domains (McLellan et al., 2006). We believe the same statement would be true for young children. An individual's substance use disorder cannot be adequately characterized by quantifying the amount, duration, and type of substance use. The Addiction Severity Index (ASI) for use with adults was introduced in the United States in 1980, and has found wide acceptance, both nationally and internationally (McLellan et al., 2006). The ASI assesses the severity of addiction and its effects on other domains of an adult's life (Denis et al., 2013). In 2009, the development of a Teen Addiction Severity Index (T-ASI) was reported. The T-ASI has seven domains similar in nature and scope to the adult ASI that are named "chemical use, school status, employment-support status, family relationships, peer-social relationships, legal status, and psychiatric status" (Kaminer et al., 1991). More recently, the T-ASI-2 was developed and tested and consists of domains that assess drug use (alcohol, marijuana, tobacco, and others), mental health issues such as depression, anxiety, attention deficit, hyperactivity, defiant behaviors, risky behaviors and mental health service utilization, treatment satisfaction, school difficulties, social functioning (family and peers), family member and peer substance use and readiness for change. All T-ASI domains have adequate to excellent internal consistency (0.54–0.88, median 0.80). The T-ASI has been successfully used to document changes in treatment over time (Brodey et al., 2008; Kaminer & Burleson, 2005).

Despite the fact that there are comprehensive measures available to assess substance use severity and associated problems in both adults and

adolescents, to date, a comprehensive measure of child substance use severity and associated problems that would assess risk, resilience and the experiences of children who use substances, or are at risk of using substances, is unavailable. A psychosocial protocol for treating children with substance use disorders called Child Interventions for Living Drug-free (CHILD) was developed (Momand et al., 2017) and originally implemented in Afghanistan, with subsequent implementation with treatment practitioners in India, Pakistan, Bangladesh, Kenya, South Africa and South America. Based on several years of experience and continuous contact with service providers who provide substance use disorders treatment to children age 7–12, the need for a comprehensive assessment instrument was apparent. Such an instrument would be helpful to determine the severity of needs in various life domains of children to aid treatment planning and measure treatment progress of the child.

The primary purpose of our ongoing research program is to develop and systematically evaluate a broadband child assessment measure that would be appropriate for use with children 7–12 years of age. Similar to the T-ASI, this instrument, the CHILD Intervention for Living Drug-free Comprehensive Assessment of Risk, Resilience, and Experience (CHILD CARRE) measure, assesses the domains of physical health, school and support status, alcohol and other psychoactive substance use, legal issues, family/social relationships, psychiatric status, and recreational activities. These domains were selected based on those used in the T-ASI, the literature suggesting policy aspects related to children living in street circumstances (Abdi et al., 2019), as well as clinical experience from the CHILD project (Momand et al., 2017). The purpose of the present paper is to report on our initial efforts at the development of such a measure, and summarize the responses available on the CHILD CARRE measure in USA and Argentinian samples of children entering intervention programs for children living in vulnerable situations. Samples from these two parts of the world were selected based on the ability to better explore substance use among children in the USA where this issue is less developed as well as in Argentina where the

issue is more widely recognized. The concept of risk and resilience for the purpose of this instrument is to characterize the many influences on children and see their strengths as well as areas in their lives that need help. Risk factors are commonly defined as characteristics statistically related to an increase in health risks but do not always cause the ill health. Resilience is commonly defined as the ability of people to remain healthy even in the presence of risk factors (National Center for Mental Health Promotion & Youth Violence Prevention, 2004). Thus, understanding where risks can be reduced and where resilience can be promoted may help children improve healthy living.

Methods

Overview

The CHILD Intervention for Living Drug-free Comprehensive Assessment of Risk, Resilience and Experience (CHILD CARRE) measure was developed for international use based on input from substance use disorders treatment experts on several different continents. The CHILD CARRE measure is a semi-structured interview and can be used by trained personnel who have completed high school and addiction treatment training. The instrument is designed for administration to children ages 7–12. The CHILD CARRE measure consists of seven section/domains: physical health status, school and support status, drug/alcohol use, legal status, family/social relationships, psychiatric status, and recreational activities. The domains of the CHILD CARRE were based, in part, on previous research with the adult ASI (McLellan et al., 2006) and teen ASI (Kaminer et al., 1991). The study was approved by the University of North Carolina at Chapel Hill IRB (# 18-2152).

Scale development process

As noted above, Jones and colleagues developed the CHILD psychosocial protocol for treating children who are at risk or actively using psychoactive substances that has been implemented in Afghanistan, as detailed by Momand and colleagues (Momand et al., 2017). Practitioners from

Asia (Afghanistan, Bangladesh, India, Pakistan and the Philippines), Africa (South Africa, Kenya) and South America (Argentina, Brazil, Chile, Paraguay and Peru) ($n=53$) have been trained on the intervention protocol. Our experience over the past several years training providers and working with children affected by psychoactive substance use allowed collection of qualitative data based on interviews with the children as well as interviews with treatment professionals and these data showed themes that children living in substance using circumstances were at risk for use of many types of substances, were often in poor health status, in need of education, often forced to work to support the family, had multiple interactions with law, as well as unstable family situation and psychological problems. These data indicated the obvious need for developing a measure for children who were impacted by psychoactive substance use, or at risk for such use. As a result, the CHILD CARRE measure was developed in three stages: (1) Consultation, (2) Initial Scale Development, and (3) Scale Revision.

Consultation

Initial consultations were undertaken with 53 treatment professionals who work with children and who had been trained on the CHILD protocol regarding the need for a comprehensive measure suitable for children ages 7–12. The goal was to obtain their ideas for such a measure, how it could best be structured, and areas it would be important to measure. Following receipt of this feedback, it was determined to assess detailed information about children in terms of substance use behavior and other life domains of functioning that may need remediation. The children's life domains that were viewed consistently as most important include physical (including dental) health status, school adjustment, ways children made money, interaction with the law, family functioning, peer relationships, substance use, psychiatric status, and recreation activity. The selection of final domains and questions were based on a set of qualitative interviews with children who have substance use disorders and staff who work with the children. We decided to develop a semi-structured measure rather than a self-report measure because children ages 7–12 in

risky life circumstances may not have the educational background and/or skills to read and understand the questions. Moreover, an interview format permits good rapport to be established with the child so that any unclear questions on the part of the child can be addressed and resolved and questions can be re-phrased for the child. Given the age range of the children, compromises in format and structure of the measure were necessary. The measure needed to be relatively short, and so was designed to capture the minimum information needed to evaluate the nature and severity of a child's problems in the domains deemed important for interventionists. Moreover, the measure had to be sensitive to change as a result of treatment. Therefore, the domains selected were physical health status, school and support status, drug/alcohol use status, legal status, family/social relationship, psychiatric status and recreational activities. In each domain the problems can be rated by child and interviewers because a child may give low rating to a serious problem or vice versa. Items for each domain that were reflective of this feedback were then written, with a goal of writing excess items in each domain, knowing that some items would not be informative, and so the measure would be pared down.

The draft instrument was then shared with both the same and additional US and international experts who provided feedback regarding the format, instructions, and particularly the items themselves. The measure was pilot-tested with children between the ages of 7–12 in English to ensure that they could comprehend the items and to determine the length of administration of the measure. This process resulted in revising some items, adding new items, and dropping other items.

Initial development stage

As part of usual care, the initial CHILD CARRE measure was administered to 40 children living with their mothers who were in treatment for substance use disorders at UNC Horizons. All parents provided consent for their child to be assessed and to collect both baseline and post-treatment data at 45–90 days (*mean* 61.53) into their intervention. The individual items were

analyzed examining measures of location (means, medians), spread (range, *SD*, *SIQR*), and item-total correlations for items within each domain. The goal of these analyses was simply to determine if items might be suffering from floor or ceiling effects, range restriction, or excessive variability (suggesting difficulty or ambiguity in interpreting the meaning of the item), and whether items were sensitive to change from baseline to post-treatment. Based on the results of these analyses, items were dropped or re-written, and feedback was again obtained from experts who reviewed the results of the analyses, and further item revisions were undertaken.

Revised scale

Based on the above results, a revised CHILD CARRE measure was developed to measure the same 7 domains of child behavior as in the initial version: Physical Health Status (9 items), School and Support Status (16 items), Drug/Alcohol Use (19 items), Legal Status (4 items), Family/Social Relationships (24 items), Psychiatric Status (10 items), and Typical Recreational Activities (36 items). (A copy of the CHILD CARRE measure can be found in [Supplementary Figure 1](#)) Item selection was based on measuring different aspects of a child's life and how substance use might affect these aspects of child development and functioning. Attention was paid to the wording of each CHILD CARRE question to make the measure quite simple and easy for even young children to understand. The CHILD CARRE measure was developed in order both to determine the severity of needs in various life domain that can benefit from treatment and help with treatment planning and to measure the progress made in the treatment of a child with substance use behavior. It provides for standardization of assessment that will enable the comparison of behavior change within the child and between children and programs. Following revision, the English measure was translated into Spanish and then underwent back translation into English to review for corrections. The Spanish translation accuracy was checked and refined using three independent translators fluent in Spanish who were familiar with the topic area. Finally,

Table 1. Demographic information ($N = 134$).

Site	<i>n</i>	Girls	Boys	Age [mean (SD)]
Chapel Hill	20	9	11	9.8 (1.6)
Foundation Convivir	64	39	25	8.9 (1.5)
Manos De La CAVA	50	24	26	9.0 (1.8)

interviewers were trained on how to administer the measure to children (see below).

Sites

The CHILD-CARRE measure was piloted as a part of usual care in three treatment sites, Foundation Convivir and Manos De La Cava in Argentina and UNC-Horizons in Chapel Hill, NC USA. Each site has multi-disciplinary teams (psychologists, and social workers, and educators, among other specialists) (Table 1).

Foundation convivir

Foundation Convivir has an outpatient treatment center providing treatment to both adults and children with problematic use of psychoactive substances, specializing in dual diagnosis. Patients in the program must take an active role in the treatment process. Convivir counselors work on the change of personal and family dynamics and the patients are encouraged to build their lives through the development of skills and strengths during the entire time in treatment. Treatment components for children include group and individual treatment, family support groups, and life skill activities including school support. The treatment team consists of professionals specializing in the field of health and work in coordination with various public and private sectors.

Manos De La cava in Argentina

Manos De La Cava provides general psychosocial and case management support for children and their family members. The program takes a preventive approach that is integral to the entire process. The team works using community outreach and engagement and to help families fulfill basic needs such as food, clothing, shelter and education. Intervention components for children include outreach, education on site, family education and life skill activities. The treatment team consists of para-professionals who work in coordination with various public and private sectors.

UNC horizons

UNC Horizons offers outpatient and residential treatment for women with substance use disorders and their children. The UNC Horizons program is based primarily on the relational model of female development, and utilizes evidence-based curricula and state-of-the-science practices in women responsive treatment. Programing focuses on substance use disorder education, relapse prevention, parenting, healthy relationships, health and safety, family planning, trauma recovery, employment services, life skills and budgeting. Women and children can receive individual evaluations, individual counseling, case management services, outreach, home visits, maternal and child psychotherapy, individual parenting and attachment based treatment and psychiatry services. Horizons provides comprehensive assessments for all of the residential children, and a full range of intervention services such as screening, assessment and treatment for speech, language, hearing and physical, social, emotional and cognitive development (UNC Department of Obstetrics and Gynecology, 2020).

Interviewer training

Potential CHILD CARRE interviewers were trained on the use of the measure by Dr. Jones, who had developed the CHILD intervention protocol. The interviewer was trained in didactic and role play modalities to first understand the intent of each question, and how to deal with questions and lack of understanding on the part of a child. The interviewer was assessed for being able to form a positive rapport with children from diverse social and cultural backgrounds. She/he must be able to help the child separate the problem areas and to examine them individually using the questions provided. As per the guidance by the developer, each question does not need to be asked exactly as stated, use words appropriate to the particular child. Any added information is recorded in the “comments” section in each domain. Some children may have short attention spans, and thus breaking the assessment into parts collected over several days is currently acceptable (pending further research in this regard). The interviewer has to have the

CHILD-CARRE measure, a calendar showing days and weeks in the month before and the current month, and response cards as well as snacks and water for the child to consume during the interview. Training consisted of completing an eight-hour training by the developer of the measure that included a review of overall purpose of the measure, item-by-item review, role play practice, and then feedback on interviews completed with children.

Administration of the revised CHILD CARRE measure

Parents of the children were asked for permission to administer the CHILD-CARRE measure. All parents granted permission and all children who met the age criteria were invited to complete the CHILD-CARRE measure. Of the 134 children requested to be interviewed none of them declined. The time of administration varied depending on a child’s problems and comprehension. On average, the administration of CHILD CARRE measure took 1½ hours.

The final sample consisted of 134 children ages 7–12 who were administered the CHILD CARRE measure at intake into their respective treatment program, with 129/134 (96%) administered the measure following treatment. The length of time to the follow-up assessment, which was after completion of treatment, varied between 1½ and 3 months.

Data entry and management

Data was entered into a REDCap database and analysis was conducted by SAS version 9.4.

Statistical analysis

Descriptive statistics are presented on each item on the revised CHILD CARRE.

Results

Participants

Participants were 134 children (53% girls, 47% boys) recruited in three sites: 64 children (38 girls, 26 boys) were recruited for the study by

Foundation Convivir in Argentina, 50 children (24 girls, 26 boys) were recruited by Manos De La Cava in Argentina and 20 children (9 girls, 11 boys) were recruited in Chapel Hill, USA. The average age of the children was 9.1 years ($SD = 1.7$).

CHILD CARRE domains

For each domain, the items and their frequencies (percentages) or means (SD s) can be found in Tables 2–8. What follows is a summary of the important points for each domain. In certain cases, frequencies or proportions are provided in the paper that summate across multiple possible response categories for a given item; such that information cannot be found in the tables.

Physical health status

This domain has 9 questions (see Table 2). According to the interviewer rating, 56% of children were rated in the moderate or more need of medical treatment and over half of children (64%) report that they would like to feel better. Almost one-fourth (23%) of children were

Table 2. Physical health status domain item responses ($N = 134$).

Item	[n (%) or [mean (SD)]
Have you ever seen doctor? (1 = Yes, 0 = No) [n (%)]	122 (91.1%)
How many times have you been in the hospital? [n (%)]	
Once	29 (23.4%)
Twice	13 (10.5%)
Three times	10 (8.1%)
Four times	4 (4.1%)
Five times	4 (3.2%)
Six times	1 (0.8%)
Seven times	2 (1.6%)
Ten times	1 (0.8%)
Do you take any medication for medical issue? [n (%)]	43 (23.3%)
Do your teeth or gums hurt? [n (%)]	89 (66.4%)
Have you ever been to a dentist? [n (%)]	69 (51.9%)
For female, have you ever been pregnant? [n (%)]	2 (2.9%)
How much do your medical problems get in the way with doing things you like to do? (Scale: 0 = "Not at all," 1 = "Slightly," 2 = "Moderately," 3 = "Considerably," 4 = "Extremely") [mean (SD)]	1.1 (1.1)
How much do you like to feel better? (Scale: 0 = "Not at all," 1 = "Slightly," 2 = "Moderately," 3 = "Considerably," 4 = "Extremely") [mean (SD)]	1.7 (1.6)
How much do you rate the child's need for medical treatment? (Scale guidelines: 0–1 = "No real problem, treatment not indicated," 2–3 = "Slight problem, treatment probably not necessary," 4–5 = "Moderate problem, some treatment indicated," 6–7 = "Considerable problem, treatment necessary," 8–9 = "Extreme problem, treatment absolutely necessary") [mean (SD)]	4.2 (2.5)

currently taking medication for a medical issue, meaning that they have had at least some limited access to healthcare services. Three percent of the female participants reported that they been pregnant which indicates that there is need for sexual education and information regarding use of contraceptives as early as possible among both older girls and boys in this age range. It is likely that these children need more education on oral hygiene and/or greater access to dental services, as 66% of the children indicated that their teeth or gums hurt.

School and social support status

This second domain has 16 questions, one of which is a multi-part question (see Table 3). Almost without exception, the children (98%) were provided food and place to sleep by a biological parent or other family members. Although 92% of the children were enrolled in school, school absenteeism would be an issue for them because more than half (61%) of the children reported that they missed school one or more days each week and 12% of the children had been suspended or expelled from school. Some children (26%) responded that they made money and the average age at which they started making money was 8. Almost half of the child made money through working for family (51%) although working on street (31%), and begging (29%) were also common sources of income. Most children (94%) reported that going to school was important for them and according to the interviewer rating, 77% were moderately or more in need of school help and 77% were moderately or more in need of economic support.

Drug/alcohol use

This domain has 19 questions, with the questions regarding substance use history being multi-part questions (see Table 4). Seeing someone drunk or high was common (74%) among children while 11% had seen injecting drug use. Almost one-quarter (24%) of children reported having ever tried alcohol or other psychoactive substances. Among these 32 (24%) children, the most common types of psychoactive substance use reported were alcohol (91%), cannabis (56%), and inhalants (31%). More than half (62%) of the children

Table 3. School and social support status domain item responses ($N = 134$).

Item	[<i>n</i> (%) or [mean (SD)]
What is the last grade you completed in school? [mean (SD)]	3.4 (1.6)
Do you know how to read? [<i>n</i> (%)]	76 (56.7%)
Are you currently enrolled in school? [<i>n</i> (%)]	123 (91.8%)
How many days do you miss school each week? [mean (SD)]	1.2 (1.2)
How many times have you changed schools? [mean (SD)]	0.9 (1.2)
How many times have you repeated a grade? [mean (SD)]	0.21 (0.6)
Have you ever been suspended or expelled or told not to come to school? [<i>n</i> (%)]	16 (11.9%)
Do you know how to use a computer? [<i>n</i> (%)]	105 (78.4%)
Is there someone who provides you food and place to sleep?	
Biological mother or father [<i>n</i> (%)]	104 (77.6%)
Other family member [<i>n</i> (%)]	28 (20.9%)
One or more friends [<i>n</i> (%)]	1 (0.7%)
no one, I am on my own [<i>n</i> (%)]	1 (0.8%)
Have you made money? [<i>n</i> (%)]	10 (29.4%)
At what age did you first start to make money? [mean (SD)]	8.0 (1.7)
About how much money do you make each week? [mean (SD)]	180.3 (170.4)
I Keep it. [<i>n</i> (%)]	10 (29.4%)
I have to spend it quickly [<i>n</i> (%)]	20 (58.8%)
I give it to a caregiver [<i>n</i> (%)]	2 (5.9%)
I give it to someone else [<i>n</i> (%)]	2 (5.9%)
How important is it to you to go to school? (Scale: 0 = "Not at all," 1 = "Slightly," 2 = "Moderately," 3 = "Considerably," 4 = "Extremely") [mean (SD)]	2.8 (1.1)
How would you rate the child's need for school help? (Scale guidelines: 0-1 = "No real problem, treatment not indicated," 2-3 = "Slight problem, treatment probably not necessary," 4-5 = "Moderate problem, some treatment indicated," 6-7 = "Considerable problem, treatment necessary," 8-9 = "Extreme problem, treatment absolutely necessary") [mean (SD)]	5.4(2.5)
How would you rate the child's need for economic support help? (Scale guidelines: 0-1 = "No real problem, treatment not indicated" 2-3 Slight problem, treatment probably not necessary" 4-5 = "Moderate problem, some treatment indicated" 6-7 = "Considerable problem, treatment necessary" 8-9 = "Extreme problem, treatment absolutely necessary") [mean (SD)]	5.7 (2.8)

Table 4. Drug/Alcohol use status domain item responses ($N = 134$).

Item	[<i>n</i> (%) or [mean (SD)]
Have you ever seen someone drunk or high by smoking? [<i>n</i> (%)]	99 (73.9%)
Have you ever seen someone use a needle to administer any of these drugs to herself/himself? [<i>n</i> (%)]	15 (11.3%)
Have you ever tried alcohol or drugs? [<i>n</i> (%)]	32 (23.9%)
Have you passed out/blacked out after using alcohol or drugs? [<i>n</i> (%)]	15 (46.9%)
How much money would you say you spent during the past 7 days on alcohol? [mean(SD)]	15.8 (58.3)
How do you most often use drugs?	
Alone [<i>n</i> (%)]	6 (20.0%)
Friends [<i>n</i> (%)]	20 (66.7%)
Family [<i>n</i> (%)]	3 (10%)
Friends and family [<i>n</i> (%)]	1 (3.3%)
How many times have you been treated for drug use? [mean (SD)]	0.3 (0.9)
How many days in the past 7 days has alcohol or drug use stopped you from doing things you like to do or gotten you in trouble? [mean (SD)]	0.2 (0.5)
How would you rate the child's need for alcohol or drug treatment? (Scale guidelines: 0-1="No real problem, treatment not indicated," 2-3="Slight problem, treatment probably not necessary," 4-5="Moderate problem, some treatment indicated," 6-7="Considerable problem, treatment necessary," 8-9= "Extreme problem, treatment absolutely necessary") [mean (SD)]	2.6 (3.2)
Age at first use of psychoactive substance use ($n = 32$) [mean (SD)]	8.4 (2.5)
Number of days use psychoactive substances in the past 30 days ($n = 24$) [mean (SD)]	5.0 (5.3)
Number of years of psychoactive substance use in lifetime ($n = 18$) [mean (SD)]	1.6 (0.9)
Risk level among psychoactive substance users ($n = 26$) [mean (SD)]	3.7 (1.4)

reported first having consumed alcohol between 6-9 years of age while 35% had consumed alcohol for the first time between 10 and 12 years of age. Similarly, 50% of children who reported using cannabis had first used between 6 and 9 years of age while the inhalant use was more common (80%) between 6 and 9 years of age. Over half (59%) of the children started using psychoactive

substances between 7 and 9 years of age. The average age of starting psychoactive substances was 8.41 ($SD = 2.49$). In the past 30 days, children used psychoactive substances a mean of 5.0 days in the past month ($SD = 5.32$). This group of children using substances had used psychoactive substances a mean of 1.6 years ($SD = 0.9$) in their lifetimes. The interviewer rated that half (50%) of

Table 5. Legal status domain item responses ($N = 133$).

Item	[<i>n</i> (%)] or [mean (SD)]
Have you had any conflict with police or law? [<i>n</i> (%)]	14 (10.5%)
Have people in your family had problems with the law? [<i>n</i> (%)]	63 (47.1%)
Have you ever been taken away from your family by police or government? [<i>n</i> (%)]	25 (18.8%)
How would rate the child's need for legal help? (Scale guidelines: 0–1="No real problem, treatment not indicated," 2–3="Slight problem, treatment probably not necessary," 4–5="Moderate problem, some treatment indicated," 6–7="Considerable problem, treatment necessary," 8–9="Extreme problem, treatment absolutely necessary") [mean (SD)]	2.4 (2.9)

these children had inhalant use that was risky to very risky, while 43% had risky to very risky alcohol use, and 41% had risky to very risky cannabis use. The mean for the highest risk level rating among all psychoactive substances use for this group of children was 3.7 ($SD = 1.35$) with 4 being "very risky." Of those children who had ever tried psychoactive substance use, only 17% had received treatment, while 58% were in need of treatment according to the interviewers rating, with 32% of them in moderate or more need of treatment. Fourth (25%) of them reported that alcohol or substance use stopped them from doing something they liked to do.

Legal status

This domain has four questions (see Table 5). A minority of children (10%) reported having had conflict with police or law enforcement, while 47% reported that a family member had problems with the legal system. Almost one-fourth (19%) of the children had been taken away from their family by police or the government. According to the interviewers rating, 31% of children were moderately or more in need of legal help.

Family/social relationships

This domain has 24 questions with two of the questions being multi-part (see Table 6). In terms of their living circumstances, 35% of the children were living with both parents, 43% with a single parent, 5% with a step-parent, and 15% were living with other relatives. Almost 26% report that they have run away from home in the past. More than three-fourths of the children (86%) reported spending most of their time with family or friends and 79% were satisfied spending their time this way. A relative small percentage (10%) of children reported that they ever been a member of gang. In the past 30 days, they reported

that they had participated in sport or recreational activities on average for 5 days. Almost 20% of children reported that their close friends use alcohol or drugs. Among children 83% reported that they have seen family members smoking, 67% of children reported seeing family members using alcohol and 49% of children reported that they saw family members using drugs. Violence is common in the lives of children as 58% of them reported that their family were violent toward them. According to the interviewers rating, 77% of children were moderately or more in need of family and/or social counseling.

Psychiatric status

This domain has 10 questions (see Table 6). While only 8% of the respondents reported they had taken medication for mental problems, according to the interviewer, 35% of respondents were deemed by the interviewer to have a mental health issue that needed treatment (9% had a moderate problem, 16% had a considerable problem, and 10% had an extreme mental health problem). Sadness and a sense of hopelessness were prevalent in the sample, with 40% of respondents indicating they had experienced these feelings a few times to many times, while 41% indicated feeling very tense, uptight and unreasonably worried a few times to many times, and 24% reported trouble in understanding, concentrating or remembering a few times to many times. This level of endorsement of these items suggest that symptoms of depression and anxiety were common in the sample. However, only 3% of respondents indicated that they had cut themselves, harmed themselves, or thought seriously of suicide, and no respondent had attempted suicide.

Table 6. Family/Social relationships domain item responses ($N = 134$).

Item	[<i>n</i> (%)] or [mean (SD)]
What is your current living environment?	
Both parents [<i>n</i> (%)]	47 (35.1%)
Single parent [<i>n</i> (%)]	58 (43.3%)
Other relative [<i>n</i> (%)]	21 (15.7%)
Public care facility [<i>n</i> (%)]	1 (0.7%)
Parent/stepparent [<i>n</i> (%)]	7 (5.2%)
How many times in the past year have you moved? [mean (SD)]	0.9 (1.8)
Have you ever run away from home? [<i>n</i> (%)]	34 (25.9%)
With whom do spend most of your free time?	
Family [<i>n</i> (%)]	57 (42.8%)
Friends [<i>n</i> (%)]	58 (43.6%)
Alone [<i>n</i> (%)]	18 (13.5%)
Are you satisfied spending your free time this way? [<i>n</i> (%)]	104 (79.4%)
Have you ever been a member of gang? [<i>n</i> (%)]	14 (10.5%)
How many days in the past 30 days did you participated in sports or other recreational activities with other? [mean (SD)]	5.6 (5.6)
How many close friends do you have? [mean (SD)]	4.8 (4.1)
How many of these friends use alcohol or drugs? [mean (SD)]	0.6 (1.5)
Which of these issues have you seen happen with your mother:	
Use alcohol or get drunk? [<i>n</i> (%)]	4 (32.6%)
Get high on drugs? [<i>n</i> (%)]	35 (26.3%)
Smoke cigarette? [<i>n</i> (%)]	75 (56.8%)
Work all the time? [<i>n</i> (%)]	27 (20.3%)
Gamble? [<i>n</i> (%)]	3 (2.3%)
Suicide? [<i>n</i> (%)]	1 (0.7%)
Mental illness? [<i>n</i> (%)]	8 (6.0%)
Violence? (Yells a lot at another, pushes and shoves in an argument, hits someone in the family) [<i>n</i> (%)]	53 (40.2%)
Which of these issues have you seen happen with your father:	
Use alcohol or get drunk? [<i>n</i> (%)]	52 (41.9%)
Get high on drugs? [<i>n</i> (%)]	28 (22.6%)
Smoke cigarette? [<i>n</i> (%)]	61 (49.2%)
Work all the time? [<i>n</i> (%)]	27 (21.8%)
Gamble? [<i>n</i> (%)]	4 (2.3%)
Suicide? [<i>n</i> (%)]	1 (0.8%)
Mental illness? [<i>n</i> (%)]	1 (0.8%)
Violence? (Yells a lot at another, pushes and shoves in an argument, hits someone in the family) [<i>n</i> (%)]	46 (37.1%)
Which of these issues have you seen happen with your brother/sister:	
Use alcohol or get drunk? [<i>n</i> (%)]	31 (24.8%)
Get high on drugs? [<i>n</i> (%)]	18 (14.4%)
Smoke cigarette? [<i>n</i> (%)]	34 (26.9%)
Work all the time? [<i>n</i> (%)]	5 (3.9%)
Gamble? [<i>n</i> (%)]	2 (1.6%)
Suicide? [<i>n</i> (%)]	1 (0.8%)
Mental illness? [<i>n</i> (%)]	4 (3.2%)
Violence? (Yells a lot at another, pushes and shoves in an argument, hits someone in the family) [<i>n</i> (%)]	33 (26.2%)
Which of these issues have you seen happen with your aunt/uncle:	
Use alcohol or get drunk? [<i>n</i> (%)]	48 (39.1%)
Get high on drug? [<i>n</i> (%)]	35 (28.5%)
Cigarette smoker? [<i>n</i> (%)]	47 (38.2%)
Work all the time? [<i>n</i> (%)]	18 (14.6%)
Gamble? [<i>n</i> (%)]	2 (1.6%)
Suicide? [<i>n</i> (%)]	1 (0.8%)
Mental illness? [<i>n</i> (%)]	1 (0.8%)
Violence? (Yells a lot at another, pushes and shoves in an argument, hits someone in the family) [<i>n</i> (%)]	37 (29.8)
Which of these issues have you seen happen with your grandmother/grandfather:	
Use alcohol or get drunk? [<i>n</i> (%)]	27 (21.4%)
Get high on drug? [<i>n</i> (%)]	12 (9.5%)
Cigarette smoker? [<i>n</i> (%)]	45 (35.7%)
Work all the time? [<i>n</i> (%)]	20 (15.9%)
Gamble? [<i>n</i> (%)]	4 (3.2%)
Mental illness? [<i>n</i> (%)]	2 (1.6%)
Violence? (Yells a lot at another, pushes and shoves in an argument, hits someone in the family) [<i>n</i> (%)]	27 (21.4%)
Which of these issues have you seen happen with yourself:	
Use alcohol? [<i>n</i> (%)]	13 (10.5%)
Get high on drugs? [<i>n</i> (%)]	11 (8.9%)
Smoke cigarette? [<i>n</i> (%)]	9 (7.3%)
Gamble? [<i>n</i> (%)]	1 (0.8%)
Mental illness? [<i>n</i> (%)]	1 (0.8%)
Violence? (Yells a lot at another, pushes and shoves in an argument, hits someone in the family) [<i>n</i> (%)]	11 (8.8%)
Number of family members who you have seen use alcohol or get drunk in the past 30 days? [mean (SD)]	1.5 (1.4)
Number of family members who you have seen get high on drugs in the past 30 days? [mean (SD)]	0.9 (1.4)

(continued)

Table 6. Continued.

Item	[<i>n</i> (%) or [mean (SD)]
Number of family members who you have seen smoke cigarettes in the past 30 days? [mean (SD)]	1.9 (1.3)
Number of family members who you have seen gamble in the past 30 days? [mean (SD)]	0.1 (0.5)
Number of family members who you seen suicide in the past 30 days? [mean (SD)]	0.03 (0.2)
Number of family members who you seen was violent in the past 30 days? [mean (SD)]	1.5 (1.5)
Number of family members who you seen have mental illness in the past 30 days?	0.1 (0.2)
How many siblings do you have? [mean (SD)]	3.3 (2.1)
Have you had times when you have experienced serious problems getting along with mother? [<i>n</i> (%)	38 (28.6%)
Have you had times when you have experienced serious problems getting along with father? [<i>n</i> (%)	30 (23.3%)
Have you had times when you have experienced serious problems getting along with brother/sister? [<i>n</i> (%)	31 (22.9%)
Have you had times when you have experienced serious problems getting along with other family members? [<i>n</i> (%)	25 (18.8%)
Have you had times when you have experienced serious problems getting along with friends? [<i>n</i> (%)	27 (20.3%)
Have you had times when you have experienced serious problems getting along with neighbors? [<i>n</i> (%)	19 (14.3%)
Have you had times when you have experienced serious problems getting along with teachers? [<i>n</i> (%)	12 (9.1%)
Have you had times when you have experienced serious problems getting along with mentor? [<i>n</i> (%)	4 (3.1%)
Have you had times when you have experienced serious problems getting along with others? [<i>n</i> (%)	2 (1.7%)
How much do members of your family support and/or help one another? (Scale: 0 = "Not at all," 1 = "Slightly," 2 = "Moderately," 3 = "Considerably," 4 = "Extremely") [mean (SD)]	2.5 (1.2)
How much do members of your family fight and/or have conflicts with one another? (Scale: 0 = "Not at all," 1 = "Slightly," 2 = "Moderately," 3 = "Considerably," 4 = "Extremely") [mean (SD)]	2.1 (1.3)
How much do members of your family participate in activities together? (Scale: 0 = "Not at all," 1 = "Slightly," 2 = "Moderately," 3 = "Considerably," 4 = "Extremely") [mean (SD)]	2.1 (1.6)
How much are you able to confide in your parent/caretaker? (Scale: 0 = "Not at all," 1 = "Slightly," 2 = "Moderately," 3 = "Considerably," 4 = "Extremely") [mean (SD)]	2.2 (1.4)
How much are you able to express yourself and be heard in your family? (Scale: 0 = "Not at all," 1 = "Slightly," 2 = "Moderately," 3 = "Considerably," 4 = "Extremely") [mean (SD)]	2.1 (1.3)
How would you rate the child need for family and/or social counseling? (Scale guidelines: 0–1 = "No real problem, treatment not indicated," 2–3 = "Slight problem, treatment probably not necessary," 4–5 = "Moderate problem, some treatment indicated," 6–7 = "Considerable problem, treatment necessary," 8–9 = "Extreme problem, treatment absolutely necessary") [mean (SD)]	5.6 (2.6)

Recreational activities

This domain has 35 questions (See Table 8 for a list of the activities reviewed by the respondent, and their rates of endorsement). Questions in this domain ask "What kind of things would a Child like to do if he or she was not using drugs." Children (40%) were interested in indoor activities (watching tv, games, watching movie, going to movies, cooking, eating out, computer, reading, arcades, pinball, museum, religious, chess, and making clothes). Another 34% of children were interested in creative art (painting, listening to music, dancing, acting, crafts, learning magic, singing, using clay, carpentry, circus and photography) and 26% were interested in physical activity (football, swim, play sports, play outside, boxing, martial arts, exercise, camping, and fishing).

Discussion

Participants

Collectively, children have both risk and resilience features. For risks, they appeared disenfranchised from the greater medical system, in many cases lacking a stable and functioning family,

living in the context where they observe active substance use and living in need of school stability. In terms of resilience, most students were enrolled in school and they reported knowing how to use a computer and being interested in variety of recreational activities. Overall, findings reveal that children affected by substance use have been facing with multiple risks/issues in different aspects of life. The average age of children at first use for most drugs was 8 years which indicates that drug prevention and treatment program is needed to target children and their families as early as possible. Health education and sexual education is also needed to prevent unwanted pregnancies in these vulnerable population. School help and family/social counseling services are crucial for these children. These findings underscore the multiple challenges children face that have been highlighted in other samples of children at risk for or using substances before age 12, such as domestic violence, maltreatment, loss of nuclear families, running away from home, and working (Bhattacharjee et al., 2016; Pagare et al., 2004).

Table 7. Psychiatric status domain item responses ($N = 134$).

Item	[n(%)]/[mean SD]
Have you ever taken medications to treat your mental problems? [n (%)]	10 (8.3%)
The following 7 questions were answered using the following 4-point scale: 0 = "Never," 1 = "Once," 2 = "A few times," 3 = "Many times"	
Felt very sad and had a sense of hopelessness? [mean (SD)]	2.2 (1.2)
Felt very tense, upright and unreasonably worried? [mean (SD)]	2.1 (1.2)
Saw things or heard voices that others did not see or hear? [mean (SD)]	1.1 (0.4)
Had trouble understanding, concentrating or remembering? [mean (SD)]	1.7 (1.1)
Cut self in some way? [mean (SD)]	1.2 (0.6)
Harmed self in some way? [mean (SD)]	1.1 (0.5)
Thought seriously about suicide? [mean (SD)]	1.1 (0.3)
How would rate the child's need for psychiatric treatment? (Scale guidelines: 0–1 = "No real problem, treatment not indicated," 2–3 = "Slight problem, treatment probably not necessary," 4–5 = "Moderate problem, some treatment indicated," 6–7 = "Considerable problem, treatment necessary," 8–9 = "Extreme problem, treatment absolutely necessary") [mean (SD)]	2.7 (3.1)

Table 8. Recreational activities: endorsement rates ($N = 134$).

Activity	n (%)
Watch TV	67 (50.8%)
Draw or paint	63 (47.7%)
Listen to music	51 (38.6%)
Dance	46 (34.8%)
Play Football	41 (31.1%)
Play video games	41 (31.1%)
Watch a movie	38 (28.8%)
Go to the movies	36 (27.3%)
Swim	34 (25.7%)
Cook	32 (24.2%)
Go out to eat/to a cafe	26 (19.7%)
Computers	24 (18.2%)
Play Sports	23 (17.4%)
Play outside	23 (17.4%)
Drama or acting	23 (17.4%)
Crafts	22 (16.7%)
Boxing	21 (15.9%)
Martial arts (Karate, etc.)	21 (15.9%)
Exercise	20 (15.1%)
Read	20 (15.1%)
Learn magic tricks	17 (12.9%)
Singing/Choir	16 (12.1%)
Go camping	15 (11.4%)
Making things out of clay	14 (10.6%)
Go to arcades	14 (10.6%)
Carpentry/furniture making	11 (8.3%)
Circus	11 (8.3%)
Go fishing	11 (8.3%)
Pinball	8 (6.1%)
Go to museum	6 (4.5%)
Photography	5 (3.8%)
Religious activities	5 (3.8%)
Chess	4 (3.1%)
Make clothes	4 (3.1%)

Domains

The following 7 paragraphs highlight the important findings within each domain, with an emphasis on what might be the behaviors that would be considered high risk.

Physical health status

There are two important findings regarding physical health status questions. First, findings suggest that children need regular well-child medical visits. Such need is in line with other studies of

children living in risky life situations. (Respiratory and skin diseases were the major morbidity problems among children in street circumstances in Egypt.) (Rizk et al., 2017). Second, even in this early-age population, our findings indicate a need for early accurate reproductive life planning that includes education about sexually transmitted diseases and trauma reduction, and access to contraceptive practices.

School and support status

Missing school is an important issue, which needs to be brought to the attention of families, as well as possibly recruiting school personnel to help with school attendance. With regard to school, an aspect of resilience is that almost all children saw the need and value of school. An area for intervention is that not all children could read and many regularly miss days of school each week. The fact that such young children are working for money for their family, often on the street and/or begging, underscores the need to treat the whole family and address the economic struggles that the families face and need support to overcome.

Drug/alcohol use

Almost a quarter of the children reported use psychoactive substances, and among those children, 47% reported that they had passed out/blacked out after such use. This finding was which means that they need treatment interventionists need to provide information about harm of drugs to children and need to work with friends and family of the child. The age at first use of drug was 6 for alcohol, cannabis and inhalants, the age at first use of cocaine and

barbiturate was 8 and for opiates the age at first use was 10, however, 6% reported that they have been exposed to barbiturate and alcohol at 1 year. This finding indicates that substance use prevention interventions are needed as early as possible to target children and families. Within the domain of psychoactive use, most children reported witnessing substance use by their caretakers. Given that the interviewers reported that one third (32%) were in moderately or more need of substance use disorder treatment help, suggests that children might be under-reporting their use.

Legal status

The fact that 10% reported conflict with the law suggests an opportunity to work collaboratively with police and the justice system to provide ways to address the needs of an at-risk group of children.

Family and social relationships

Areas of resilience included the fact that the majority of children spend most of their time with family or friends and that they were satisfied spending their time this way. The areas in need of possible intervention included the conflicts that children reported with family and other social contacts and the likely traumatic exposure to violence. Family problems are critical to assess and treat, as issues related to family have been repeatedly shown to be important factors that both increase risk for mental health symptoms as well as serve as predictors of substance use among children (Bhattacharjee et al., 2016; Maciel et al., 2013; Pagare et al., 2004).

Psychiatric status

The results that 35% of respondents were deemed by the interviewer to have a mental health issue that needed treatment is similar to other reports of children in stressful life situations (e.g. 49% of children ages 5–17 who faced forced separation from their parents due to immigration had emotional problems; 67% of a Brazilian sample of children working in the streets having presenting mental health problems and 51.2% of an Iranian sample of children living on the streets had depression (MacLean et al., 2020; Hoffmann et al., 2017; Abdi

et al., 2019). As such, symptoms of depression and anxiety were common in respondents, indicating a likely need for a mental health intervention in this population of at-risk young children.

Recreational activities

The most common five activities children like to do were watching TV (51%), painting (48%), listening to music (39%), dancing (35%) and football (31%) and the least common activities children would like to do were make clothes (3%), chess (3%), religious activity (4%), and photography (4%). These activities can show that what kinds of activities could be considered for fun for children while providing services for them.

Limitations

Several limitations to the findings should be noted. First, the sample is from only two different countries with small samples. Thus, future research is needed to determine the extent this measure is useful in other cultures and contexts. Second, the data are from the child's self-report and were not verified with collateral or objective data sources. Thus, the CHILD CARRE instrument needs further testing to establish each domain scores and its reliability. Finally, future studies will need to examine the extent to which CHILD CARRE domain scores can predict treatment effectiveness, and reflect change before and after an intervention. Nonetheless, this study provides an important first step forward to developing a comprehensive assessment measure for this vulnerable population.

Conclusions

Results indicate that it is feasible to develop and implement a comprehensive assessment for children at risk for and/or actively using substances that are between 7 and 12 years of age. Such an assessment fills an important gap in the complete treatment process as it could aid in guiding more accurate treatment planning. This aim seems relevant because there are many effective interventions for children in risky life situations but no assessment instrument to guide them (Coren et al., 2013). Our findings suggest that

the CHILD CARRE measure can determine issues and strengths in different domains of a child's life, including behavioral, family, and social problems as well as resilience in these same areas. The information collected using the CHILD CARRE measure may serve to help the interventionist to tailor the individual treatment plan according to the needs and problems of a child. Future research will need to be conducted to address this promise. Moreover, the CHILD CARRE measure may also prove helpful in determining the outcome of interventions. Again, future research needs to address this issue.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Data availability

The data file used to support the findings of this study are available from the corresponding author upon request.

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