

Research Article

Increasing Substance Use Disorder Treatment Professionals Knowledge: The Child Intervention for Living Drug-free (CHILD) Curriculum

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Abstract

Background: A worldwide and ever-growing population of children are using psychoactive substances. To slow this problem, the Child Intervention for Living Drug-Free (CHILD) Curriculum was created to train treatment providers on how to screen, assess, and treat children between the ages of 4-12 years of age exposed to or actively using psychoactive substances. The purpose of the present project was to evaluate the extent to which completion of a six-session training of the six courses of the CHILD Curriculum met the objective of increasing the participants' knowledge of the Curriculum's approach to treating children for substance use problems.

Methods: 71 participants from Africa, Asia, and South America were invited for training and 100% accepted the invitation. Trainees completed an in-person small-group course, occurring over 32 days and comprising 256 total hours. During the CHILD Curriculum training, they completed six separate, 20-item, multiple choice knowledge assessment measures, one for each of the six courses comprising the Curriculum.

Results: Significant ($p < .001$) improvement in knowledge in each course was associated with a multivariate measure of strength of the relationship that indicated the change was substantial for five courses ($R^2 > .5$) and moderate for a sixth course. Percentage change from baseline varied from a low of 17% to a high of 63%.

Conclusion: The CHILD Curriculum provides a useful educational framework to ensure knowledge gains by trainees. This curriculum content and evaluation provides a framework for future training of providers to pre-adolescent children who use psychoactive substances or are at risk for such use.

INTRODUCTION

Children are increasingly exposed to psychoactive substance use on the part of both their peers and adults in their lives, and many are actively engaged in psychoactive-substance-using behavior around the world. The use of such substances pose health and well-being threats to children given that children's brains, organs and immune systems are more vulnerable than adult brains to the harms of substances [1]. Further, the substances and their cutting agents that suppress the immune system are an especially ominous threats to child health [2].

The World Health Organization reports that up to 90% of children in street circumstances worldwide use a psychoactive substance [3]. In South Asia, reports of children living in street circumstances and using psychoactive substances is common. For example, India has between 10 and 21 million children living in street circumstances. Heroin, opium, alcohol, cannabis, and propoxyphene (narcotic analgesic) are the five most common psychoactive substances currently being used by children in street circumstances in India [4]. In Bangladesh, over 674,000 children are living and/or working on the streets [5] and the children usually start smoking before the age of seven, with 42% smoking heroin and 24% smoking cannabis [5]. In Pakistan, up to 1.5 million children are estimated to be living in street circumstances and smaller surveys report 67% of such children reported past

month substance use and 15.9% reported themselves as regular users of substances [6].

Similar to Asia, South America also has evidence of psychoactive substance use by pre-adolescent children. For example, in Brazil, mean ages of 9 and 11 years were reported for crack cocaine use among males and females, respectively [7]. Further, among youth attending a psychoactive substance treatment prevention program in Campinas, Brazil, 84% reported seeing children 4-8 years-old using crack in the city's open air psychoactive substance markets; 44% reported "friends" using crack; and 47% reported a family member using crack [7]. Other countries in South America including Chile, Paraguay and Peru also have reports of concerning numbers of children using psychoactive substances [8-11].

Children living in street circumstances are commonly engaged by drug sellers/traffickers to transport/sell psychoactive substances due to the fact that children are cheap labor, and there is frequent legal leniency for children [12].

Treatment providers who work in countries where child psychoactive substance use is a growing concern are faced with a range of daunting challenges. First, most such providers currently work within treatment systems that focus on the needs of adults or adolescents who use psychoactive substances; age-appropriate services for pre-adolescent children are generally not integrated into the treatment infrastructure. Second, while literature exists for how to address psychoactive in utero substance exposure in newborns and substance use problems in adolescents, there is scant guidance to help a provider coping on the front lines with a pre-adolescent child. Third, even in countries that recognize the urgency of establishing age-specific/developmentally responsive psychoactive substance treatment services for pre-adolescent children, a lack of evidence-based training materials and professional training opportunities has left most treatment providers unprepared to effectively address the unique needs of this highly vulnerable and growing population.

Finally, thousands of pre-adolescent children in life settings in which psychoactive substance use is prevalent are at high risk for trauma that includes physical, sexual, and emotional abuse

as well as neglect. Treatment providers who intervene with such children are routinely faced with unraveling the complex relationship between substance use and trauma. More often than not they are doing so without the benefit of either knowledge regarding trauma within this age group and/or trauma-specific interventions that might be effective with pre-adolescents, a challenge made even more daunting because treating the extent and severity of the effects of trauma is a complex, recursive, and dynamic process [7]. Treatment providers must not only be capable of addressing trauma in relationship to substance use, but also of understanding how to address it within the broader context of families and communities [7]. Finally, when issues family members have can be addressed outcomes for the children may be enhanced [13].

The Child Intervention for Living Drug-Free (CHILD) Curriculum represents the world's first evidenced-based training program for guiding treatment professionals on how to screen, assess, and treat children between the ages of 4-12 years of age exposed to psychoactive substance use or actively using such substances [14]. The guiding key concepts underpinning the Curriculum are seen in (Table 1). These concepts are based and adapted from the "Principles of Effective Treatment" established by the National Institute on Drug Abuse [15] and the "Convention on the Rights of the Child" established by the United Nations [16].

The purpose of the present project was to evaluate the extent to which completion of a 6-session training of the CHILD Curriculum met the objective of increasing the participants' knowledge in each of the six courses of the Curriculum for how to treat children for substance use problems. The overarching goal of the training was to provide professionals with the knowledge they needed to effectively implement child substance use disorder treatment (Table 2) describes the six course topics that included an overview and introduction to child identification, assessment and treatment, followed by a focus on special considerations and counseling with children, Motivational Interviewing for children, Attachment Theory and principles of treating children with substance use disorders affected by trauma and distress, pharmacological approaches to treatment, and finally the hands-on Suitcase For Life intervention that comprised the training

Table 1: Key Concepts Underlying the CHILD Curriculum.

- Substance use disorders range from problematic use to addiction and can be treated at any stage, and at any age.
- Children encounter adults in a variety of settings each day. These adults have the potential to influence risk behaviors such as substance use, and protective factors such as education.
- Treatment should address the needs of the whole child, rather than just focusing on his or her substance use. The best approach to treatment includes supporting the child's larger life needs, such as those related to medical, psychological and social well-being, as well as housing, school and other need based services.
- Families and the community are integral to successful interventions.
- Safety measures, such as promoting child rights and staff training on ethics to prevent children from neglect and abuse, are an essential aspect to be addressed at all levels of the intervention for children and families.
- Standards of ethical treatment should apply to the treatment of substance use disorders in children and families, as for any other health care conditions.
- Child substance use needs to be identified and addressed as soon as possible.
- Children exposed to and using psychoactive substances may have medical co-morbidities and/or psychiatric co-morbidities. They should receive comprehensive services including treatment for all health conditions.
- Substance use disorders and the associated social and health challenges can be treated effectively when children and families have access to the full continuum of prevention, treatment and rehabilitation services.
- Services provided to children should be founded on good medical practice, scientific knowledge and available research.
- Integrated systems must be structured and in place to accommodate the complex needs of children and families suffering from the challenges of substance use disorders.
- Legal systems must be taken into consideration to be sure that vulnerable children are protected within constraints of existing legal structure.

Table 2: CHILD Curriculum Course Descriptions.**Curriculum 1: Interventions for Children with Substance Use Disorders**

Addresses the uniqueness of treating children with substance use disorders, beginning with the need for treatment professionals to alter intervention techniques to accommodate the child's level of cognitive and emotional development. It introduces major topics for expansion in later courses, including basic counseling skills, motivational interviewing, treatments for children exposed to trauma, pharmacological options as a part of treatment, and ethical considerations.

Curriculum 2: Treating Children with Substance Use Disorders: Special Considerations and Counseling with Children

Develops an in-depth understanding of the conceptual foundations for treating children with Substance Use Disorders. It sets forth "Key Underlying Concepts of Effective Treatment with substance use disorders" and discusses them in practical detail for application in the field. The curriculum addresses a broad range of topics, including how to identify risk and protective factors, substance use disorders as a health issue, what elements comprise different models of treatment, and how to apply these elements in practical action, a model of service delivery which includes a continuum of care, evidence-based practices, screening, assessment, and referral practices, how to form and maintain boundaries involved in healthy therapeutic relationships, and how to practice ethical guidelines for exercising professional practices.

Curriculum 3: Motivational Interviewing with children with substance use disorders

The course identifies the MI key concepts and the application of MI techniques, including FRAMES, OARS, EARS and DARN-CATS. It also guides participants towards assessing and determining the level of motivation in the child as well as how to respond to children in different stages of change.

Curriculum 4: Attachment Theory and Principles of Treating Children with Substance Use Disorders Affected by Trauma and Distress

The critical premise of this extensive course is that relationships form a child's world, including relationships with the mother, the family, and the community. It addresses relationships in the context of "Attachment Theory" and "Styles of Attachment" and further explores the complex link between a child's "style of attachment" and psychoactive substance use. This course offers specific interventions for working with children whose relationships are disrupted as well as practical tools for providers to examine if their staff is trauma-informed and their program trauma-specific.

Curriculum 5: Principles of Pharmacological Treatment for Children with Substance Use Disorders: A Menu of Options

Focuses on pharmacology as one part of a holistic and "systems approach" to managing child substance use disorders. The course presumes that not all children will need pharmacological treatment. However, for those children for whom medications can interrupt the disease process and ease symptoms, the course offers practical guidance on the management of medications. The course discusses psychoactive substance use in the context of the child's developing brain and defines "use" based on a child's active use and passive exposure.

Curriculum 6: The "Suitcase for Life" Intervention Tool

The intervention is composed of separate modules that are intended to provide basic knowledge and develop strengths and skills in the child in eight areas of functioning: Artistic Expression; Communicating and Relating; Dealing with Stress; Understanding Harms of Drugs; Keeping the Mind and Body Healthy; Personal Safety; Being a Good Citizen; and Dreaming About the Future. Each module is expected to be tailored to each unique cultural context (e.g., words, pictures and activities need to reflect the local community).

Curriculum. It was hypothesized that completion of this in-person small-group course, occurring over 32 days and comprising 256 total hours, would improve knowledge in all six areas from pre-training to post-training assessment in a sample of experienced mental health professionals.

METHODS

Curriculum Development

CHILD is a comprehensive psychosocial intervention built on multiple prevention and treatment platforms and so employs motivational interviewing techniques, contingency management, skill-building education, traditional education, trauma-informed care, and art therapy techniques. It was developed for use with children either at risk for or actively using psychoactive substances. Following pre and post-treatment evaluation of the 6 courses comprising the CHILD Curriculum, described in a previous publication [14], it was determined that a more in-depth and multifaceted training was needed to fully equip providers with the knowledge to provide treatment to pre-adolescent children (4-12 years of age) at risk or actively using psychoactive substances. Thus, an international panel of experts from Brazil, Paraguay, Pakistan, India, Afghanistan, Australia, the United States, the United Nations and the Colombo Plan were convened to identify which training topics that were in need or revision and/or expansion. They then reviewed an outline, as well as initial and final drafts of the Curriculum that included all six courses (see Table 2). The experts represented a wide range of fields and specializations, including substance use prevention and

treatment, psychology, education, pharmacology, public health, pediatric medicine, psychiatry, human rights, public policy, social integration, and community development. This highly qualified group of experts was selected due both due to eminence in their respective fields and for their first-hand experience in working directly with children using psychoactive substances and their caregivers in a variety of socioeconomic conditions and cultural settings. The final set of the six courses were then printed and participants trained using the printed material as a basis for the in-person group courses between April, 2015 and April, 2018.

Training Participants

CHILD Curriculum trainees were adult treatment providers working with children with psychoactive substance use and use disorders. The participants were selected for training based on the following criteria: successfully completing at least one previous training with the Colombo Plan, having at least 3 years of experience working with children with substance use disorders, being from countries in Africa, Asia or South America. Of 84 applicants, 71 participants were invited for training and 100% accepted the training invitation. The 71 resulting participants were from Africa (Kenya n=1 and South Africa n=1), Asia (Afghanistan n=14, Bangladesh n=10, India n=9, Pakistan n=8, Philippines n=1, and Singapore n=1), and South America (Argentina n=13, Brazil n=5, Chile n=2, Paraguay n=3, and Peru n=3). The participants were physicians (n=34), nurses (n=4), psychologists (n=6), social workers, educators or peer support/para-professionals (n=23), and treatment center administrators with clinical experience (n=4). They were 51% male and 49%

female with an average age of 38.8 (SD=7.7) and 7.8 (SD=5.8) years of experience in the field of substance use treatment.

Curriculum Training

Training was led by the lead author (HEJ) and a team of six co-trainers. The training was in person, for 8 hours per day in time spans of 10-12 days each for a total of 32 days total over the course of approximately a year. Two cohorts were trained, one in Asia and the other in South America. The training format comprised of short segments of didactic lecture followed by interactive activities that included art work demonstrating how to apply the material presented, role-plays, development of written products based on case studies and completion of group problem-based learning tasks.

Knowledge assessment

At the start of each course, before receiving any materials, the participants completed a pre-course assessment consisting of six measures, one for each CHILD content area. Following completion of the course, the participants completed a post-course assessment with the same six measures. The measures were presented in one of two orders at both pre- and post-assessment. The two possible orders were chosen at random prior to the administration of the measures.

There were six separate knowledge assessment measures, one for each course. Each measure consisted of 20 questions specific to the content of that course. Each question has four multiple choice answers, one of which is correct. A correct answer was awarded 5 points, while an incorrect answer was scored a 0, resulting in a possible range of scores between 0 and 100, inclusive, for each of the 6 measures.

Statistical analysis

The rating scales were assumed to follow a normal distribution in the population, so a linear mixed model with a fixed effect for time (pre- vs. post-course administration) and an unstructured covariance matrix was used to analyze the data. A measure of multivariate association (a generalization of the ordinary least squares univariate measure of explained variance, R^2 , with a theoretical range of 0-1, inclusive) between the fixed Time main effect and the respective repeated outcome in the statistical model [18] was calculated to assess the magnitude of the pre-post change. In addition to the test of the Time main effect, a post hoc test of whether the post-administration means for each of the six courses were significantly different from 100, which is a test of whether, on average, there was a ceiling effect to post-course performance in each of the CHILD content areas, either because a given measure lacked discrimination at post-assessment, or knowledge of course contents following completion of the training had obtained the maximum learning expected by training. All analyses were conducted with SAS version 9.4 software.

RESULTS

The Time effect was significant for all 6 CHILD Curriculum course content measures (see Table 3). The multivariate measure of strength of association indicated the change in knowledge of the course contents was substantial for Courses 1-5 ($R^2 > .5$) and

moderate for Course 6, The Suitcase for Life. Percentage change from baseline varied from a low of 17% for The Suitcase For Life to a high of 63% for the Introductory Course. All 6 of the post-administration means were found to be significantly ($p < .001$) lower than 100.

DISCUSSION

This study examined the extent to which completion of a six-session training of the CHILD Curriculum met the objective of increasing the participants' knowledge of the Curriculum for how to treat children for substance use problems. Consistent with the hypothesis, completion of this in-person small-group course improved knowledge scores in all six courses from pre-training to post-training in a sample of experienced mental health professionals. The use of this pre-post assessment methodology could allow future course directors to understand the impacts of future training of the CHILD Curriculum. Such a finding is important given that the evaluation of the CHILD Curriculum in Afghanistan showed promising results in that children who received an intervention built on the CHILD Curriculum showed improved mental and physical health and pro-social behavior [14]. Further, the fact that an intervention built on the CHILD Curriculum has been implemented in many countries around the world including Afghanistan, Pakistan, India, Bangladesh, Argentina, Peru, Paraguay, Brazil and research is ongoing regarding its efficacy in India (NIH- NIDA R01DA042822) underscores the need to ensure it can be effectively trained.

Our results are similar to other in-person training evaluations of adult trainees and medical students gaining knowledge about substance use disorders and their treatment [19-20]. Moreover, other studies of adult trainees receiving education on the topic of substance use disorders and their treatment have found that multiple-choice questions are an effective method for assessing critical-thinking skills [21]. This evaluation adds to the literature in that this is the first publication of outcomes of training courses on the topic of treating children for substance use disorders. By design, our course responds to the increased importance to educate and train health professionals to be care providers who are knowledgeable, empathetic, and engaging to children in order to meet the treatment needs of a growing patient population with SUDs.

This evaluation has several limitations. First, this examination had no control group, so the effect of repeated testing cannot be entirely discounted – although given the magnitude of the pre-post changes, such an interpretation seems unlikely. Second, the trainee cohort was composed of a convenience sample of providers with at least three years of experience with children; thus, the extent to which similar outcomes would be found with less or more experienced trainees and trainees from different countries beyond the ones included is unknown. Third, the aim of the examination was knowledge and not skills. However, now that a change in knowledge has been demonstrated, future evaluations should include a skills-based assessment. Fourth, the training was time-intensive and it is unknown to what extent the same level of knowledge would be gained with shorter or virtual training methods. Fifth, the parameters of the linear mixed model were estimated by restricted maximum likelihood methods, so the measure of multivariate association should be interpreted as

Table 3. Test statistics, p values, R^2 , least squares means (standard errors) for the Time main effect ($N=71$)

Outcome	Test statistic (df_n, df_d)	p	R^2	Least Squares Means (Standard Errors)	
				Assessment	
				Pre-	Post-
C1: Interventions for Children with Substance Use Disorders	$F(1, 65) = 184.8$	<0.001	.74	49.9(1.8)	81.1(2.1)
C2: Treating Children with Substance Use Disorders: Special Considerations and Counseling with Children	$F(1, 61) = 162.9$	<0.001	.73	65.5(1.7)	88.1(1.4)
C3: Motivational Interviewing for Children with Substance Use Disorders	$F(1,43) = 82.4$	<0.001	.66	54.4(2.3)	79.2(1.9)
C4: Attachment Theory and Principles of Treating Children with Substance Use Disorders Affected by Trauma and Distress	$F(1,43) = 85.9$	<0.001	.66	59.2(2.7)	81.9(1.8)
C5: Principles of Pharmacological Treatment for Children with Substance Use Disorders: A Menu of Options	$F(1,57)=67.9$	<0.001	.54	49.9(2.1)	70.0(2.0)
C6: The 'Suitcase for Life' Intervention Tool	$F(1,57)=28.2$	<0.001	.33	67.9(2.1)	79.3(1.3)

Notes. df_n, df_d are the numerator and denominator degrees of freedom associated with the F test statistic. Denominator df estimated by the Kenward-Rodger method. R^2 (with a theoretical range of 0-1, inclusive) is a measure of multivariate association between the fixed Time main effect and the respective repeated outcome in the statistical model.

the ability of the Time effect to explain the respective repeated outcome relative to a model that does not include a Time effect, and not as the maximum amount of variance explained in the outcome by the Time effect.

Limitations withstanding, this evaluation demonstrates that the CHILD Curriculum provides a useful educational framework to ensure knowledge is gained by trainees. Through participation in the courses, trainees touched each the domains of counseling, Motivational Interviewing, trauma and attachment, pharmacology and specific ways of working with children to improve their mental and physical health and well-being. This course content and evaluation may serve as a framework for future training of providers to pre-adolescent children who use psychoactive substances or are at risk for such use.

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