

Effectiveness of CBITS in alleviating symptoms of Post-Traumatic Stress Disorder among Adolescents Living and Attending Schools in Informal Settlements in Kajiado North sub-country, Kenya

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ABSTRACT:

Living in informal settlements has been found to be replete with multiple traumatic events, which may lead to the development of psychological disorders such as posttraumatic stress disorder (PTSD). The purpose of this study was to determine the effectiveness of CBITS in alleviating symptoms of PTSD among adolescents who attend selected public primary schools and reside in informal settlements in Kajiado County, Kenya. Two purposively selected primary schools in Ngong Sub-County were studied. A total of 698 respondents met the criteria of being 10 to 14 years old in grades 5, 6, and 7. These respondents filled assent forms after which they were screened for PTSD using the Child PTSD Symptom Scale self-report (CPSS-SR-5). Out of a sample size of 212 achieved through simple random sampling from those who had 31 and above on the PTSD scale and were administered a Socio-demographic questionnaire, only 194 completed the study. Analyses of data revealed the mean PTSD scores for males ($n = 90$) as 42.02: 95% CI [40.18 - 43.91], while for females ($n = 104$) was 45.56: 95% CI [43.61- 47.50] with $[F(1,192) = 6.577, p = 0.011]$. Further, a decrease was noted in the mean scores for PTSD as follows: from 43.42 at baseline, 35.29 at midline, and finally 33.74 at end-line; while for the control group - the mean scores for PTSD increased as follows: from 44.28 at baseline, 45.12 at midline, and 45.08 at end-line. Additionally, when paired t -tests were carried out, there was a statistically significant reduction of -8.26 in the mean PTSD scores between the baseline and midline stages in the experimental group, with $t(94) = -6.09, p = 0.000$. Similarly, there was a statistically significant reduction of -9.82 in the mean PTSD scores between baseline and end line stages in the experimental group of participants, with $t(94) = -6.94, p = 0.000$. For the third pair, a reduction of -1.56 in the mean score for PTSD between midline and end line stages in the experimental group was observed, a change that was, however, not statistically significant, $t(94) = -1.24, p = 0.218$. The results of pair 1 and pair 2 are indicative of the fact that treating the participants with CBITS led to a statistically significant reduction in PTSD symptoms between baseline and midline stages. Finally, on carrying out an independent sample's t -test, a Cohen's d of 0.089 at the baseline stage demonstrated a very small effect size. For the midline and end line stages, Cohen's d was 0.79 and 0.82 respectively showing that in each case the effect size was large: an indication that the intervention was effective in treating PTSD among the adolescents. There is therefore need to implement CBITS in alleviation of symptoms of PTSD among adolescents attending primary schools, especially in the informal settlements where access to mental health is limited.

KEYWORDS: Post Traumatic Stress Disorder, CBITS and PTSD

INTRODUCTION

Exposure to trauma has been found to affect information processing, brain development and even academic performance among adolescents. This makes trauma and its

possible consequences such as PTSD an area of interest to mental health practitioners (Bonanno A, 2010). Other effects of trauma that have been identified among adolescents may include adoption of some behaviors such as irresponsible sexual behavior, drug abuse and joining criminal groups. Such risky behaviors are likely to put their health and lives at risk, resulting to social problems, disability, disease and possibly early death. Unfortunately, living in urban informal settlements such as where this study was carried out was found to increase childhood traumas. This is in agreement with an earlier study by that revealed the effects of growing up in poverty in an informal settlement. The study asserted

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that living in informal settlements was likely to lead to individuals developing negative personality characteristics, skill deficits and problems with motivation. With traumatic events being common in informal settlements, adolescents living in such environments are likely to develop not only skill deficits but also various mental illnesses such as PTSD resulting from exposure to traumatic events. According to some studies, 75% of individuals who survive traumatic events do not develop posttraumatic stress disorder while 25% develop PTSD and other co-morbid disorders. Statistically, a lifetime prevalence of PTSD was found by WHO to be 2.3% and 2.1% in upper middle-income and in the lower middle-income countries respectively. This confirms that there are individuals who still have to grapple with the side effects of PTSD. Studies have additionally confirmed that any traumatic exposure is likely to generate stress reactions in most individuals except that those who go on to develop PTSD often experience clinically significant disturbances in their daily functioning such as academic and interpersonal interactions. This infers that reaction to traumatic stressors can either be psychopathological (uncommon) or non-psychopathological (Bowler RM, 2017).

According to Blaustein trauma in childhood is among some of the most significant and relevant psychosocial factors affecting children's education in the society today. This is supported by who asserted that students who are traumatized operate on a survival mode that affects their ability to socialize, learn, and develop other skill sets necessary for the negotiation of normal life challenges. In addition to this, asserted that Adverse Childhood Experiences (ACES) often result to lower academic achievement, higher rates of suspension, expulsion and drop-outs. As adults, these individuals are likely to have increased risks of general and mental health challenges such as diabetes, heart disease, obesity, liver disease, irresponsible substance use and abuse, depression and eventually suicide. Additionally, exposure to trauma has also been proven to cause prolonged changes in the structure of the brain such as a reduction in the overall size and underdevelopment of the cortex (Brewin CR, 2000). It also affects the brain function that leads to changes in behavior making an individual irritable, excitable and impulsive. Educationally, in addition to the evidence from the above studies, trauma was found to result to a decline in most areas of academic performance lower GPA decreased IQ and increased drop out rates. Additional behavioral consequences of traumatic stress according to and include attachment difficulties, skipping school, running away from home, involvement with the juvenile justice system, involvement with child welfare system, substance abuse, self-injury, suicidality and victim of sexual exploitation. The impact of trauma can also be viewed from a cognitive, behavioral, social or personal and mental perspectives. According to a study that was carried out in Chicago, by McCoy, Raver, and Sharkey an assessment of students' cognitive performance scores showed a statistically significant

decline when measured the week following a homicide that occurred in their block even when they had no connection to the victim. This could be supported by the fact that from a cognitive perspective, an individual exposed to trauma is often affected in their academic work because their memory, organization, concentration and comprehension are affected. Also affected is their ability to produce work, engagement in learning, and attending to classroom tasks and instruction. The language and grasping of cause-and-effect relationships are also impacted negatively (Cortina MA, 2012).

Behaviorally, these individuals struggle with self-regulation, attention, and emotions, leading to them acting out or withdrawing, feeling depressed and anxious. Socially and personally, an individual who has PTSD has lost trust and may have a challenge developing language and communication skills. They may also have difficulty processing social skills and may not be able to establish a coherent sense of self. Additionally, the mental health consequences of trauma include disorders of infancy and adolescence, anxiety disorders, mood disorders, adjustment disorders, substance use disorders, sleep disorders, and dissociative disorders. All these effects of traumatic stress originate from what it does to the brain. There is plenty of literature that confirms that the brain function and structure of the children and adolescents is adversely affected by the traumatic stress (Elklit A, 2014).

Biologically, according to the National Scientific Council on the Developing Child traumatic stress affects the neural circuits, especially of the young children and adolescents whose brains are still developing. They hypothesize that sustained activation of the neurobiological mechanisms (the hypothalamus-pituitary-adrenocortical axis, commonly known as the HPA axis) responsible for the stress response can damage the hippocampus. The stress response involves sustained levels of cortisol or Corticotropin-Releasing Hormone (CRH), whereas the hippocampus is the part of brain structure responsible for memory and learning. During a stress reaction, the body responds by activating hormones and neurochemical systems that include adrenaline and cortisol. Adrenaline is the hormone responsible mobilizing energy stores and altering blood flow to make the body ready to fight, flee or freeze during a stress reaction. Cortisol on the other hand aids in mobilizing energy stores too besides enhancing certain types of memories and activating the immune responses. These hormones need to be regulated to go back to normal levels once the stressor is removed. For this reason, continued elevated levels leads to damage to brain structure and functions which affects the behavior and functions of individuals continuously exposed to traumatic events (Foa EB, 2005).

In children, there are three areas of the brain that are adversely affected by early adversity. These include the Prefrontal Cortex (PFC) which is the thinking centre and is under activated, Anterior Cingulate Cortex (ACC) which is the

eotin regulation centre and is also under activated. Finally, the third part of the brain that is affected is the amygdala which is the fear centre and is overactivated in these children and adolescents. Considering the adverse effects that trauma imparts on those affected, and with the severity of the effects evidenced more on children and adolescents, it is important and urgent that effective treatment be found to mitigate these effects (Harder VS,2012). In the treatment of trauma, support groups, Cognitive Behavior Therapy (CBT), prolonged exposure, and Eye Movement Desensitization Reprocessing therapy (EMDR) have been empirically proven to reduce the symptoms of trauma . Prolonged exposure therapy consists of survivors recounting and re-experiencing memories and emotions related to traumatic events. It has consistently resulted in significant reductions of PTSD, depression as compared to control conditions. However, 20-50% of individuals with PTSD who go through exposure based cognitive therapies have been found to continue to meet criteria for PTSD. According to survivors of complex trauma as would be the case of adolescents in informal settlements may find it more difficult to tolerate exposure than clients dealing with simple fears and phobias (Hobfoll SE, 2002).

Additionally, there is growing evidence supporting the use of behavior therapies that are contextual such as Behavioral Activation (BA), Acceptance and Commitment Therapy (ACT), Functional Analytical Psychotherapy (FAP) and Dialectical Behavior Therapy (DBT). A study done with 18 female participants diagnosed with Borderline Personality Disorder (BPD) and PTSD showed that after one whole year of DBT treatment, the duration of outpatient stays decreased by 65%, whereas the duration of inpatient stays decreased by 45 % with a 70% increase in how the participants attended their work school (Idemudia ES, 2013).

With regard to biological treatments, the Institute of Medicine released a report in 2008 on PTSD treatments that came to a conclusion that no drugs, including the selective serotonin inhibitors could be considered effective for the treatment of trauma. Further, in a systematic review, more recent studies found that the impact of interventions for trauma such as EMDR, CBT, narrative exposure therapy for children (KIDNET), and classroom-based interventions were more or less similar to each other. Considering the effects of PTSD outlined above, it is crucial to find and apply interventions that will be effective in alleviating symptoms of PTSD, especially among the adolescents whose brains are still developing. This would stop the grievous side effects that PTSD impacts upon these adolescents, since they have a higher risk of developing PTSD due to the environmental factors they are exposed to. Therefore, with evidence arising to support the application of behavior therapies to alleviate symptoms of PTSD, this study applied CBITS among the adolescents with PTSD living in informal settlements. This study adopted Cognitive Behavioral Intervention for Trauma in Schools (CBITS) developed by Lisa Jaycox to be applied among 11-15 year olds exposed to violence or

traumatic events. CBITS was developed in collaboration with Los Angeles Unified School District (LAUSD) to be administered by psychologists, social workers, and psychiatrists. This intervention could also be used by school counselors who have mental health experience. During the development of CBITS, it was pilot tested in one clinic in Los Angeles to assess its effectiveness (Jenkins R, 2015).

The CBITS manual has since been updated based on the feedback form the social workers, parents and students who were involved in the pilot study. CBITS was modified in the past to be used specifically with immigrants under the name Mental Health for Immigrants .It was also modified by the original researchers into Support for Students Exposed to Stress (SSET). Further, CBITS was designed to teach six behavioral techniques such as psycho-education about how people are likely to react to trauma and skills to help one relax during exposure or memories of trauma or simply relaxation skills training. The other behavioral techniques are real life exposure where the participant is encouraged to practice the coping skills learned, trauma exposure where the participant is taken through imagination and finally social problem solving skills. Psycho-education has been purported to help individuals understand what the normal and the abnormal reactions to stressful situations are so that they can be empowered to better manage the trauma. Consequently, the psycho-education component of CBITS therefore, would offer an empowering training of groups with the objective of promoting individual's awareness and proactivity in managing their environment. In addition to this, psycho-education is meant to not only equip the adolescents with tools to manage, but to cope and live with a chronic traumatic condition if they are to continue living within the same environment facing the same exposure. Psycho-education will also help in destigmatizing the symptoms that accompany traumatic stress such as anger, grief and anxiety (Le Minh TH,2016).

According to Jaycox this intervention is therefore appropriate in reduction of PTSD symptoms for adolescents with moderate to severe level of PTSD symptoms which is represented as scores of 21- 40 and 41 – 60 respectively in the scale of CPSS-SR-5. The CBITS protocol provides for the participants with PTSD scores of 41-60 indicating severe PTSD. These individuals who are diagnosed with severe PTSD will still benefit from the group sessions of CBITS but may need one to three sessions of individual therapy running concurrently with the group sessions. This is an integral feature of this treatment protocol since it caters for severe cases, and only advocates for referral of PTSD scores that are above 60. However, in this study, the adolescents with scores of 41-60 were not be exposed to individual therapy to avoid them having skewed outcome in comparison to other participants (Mbayo AW, 2019).

The symptom that this intervention targets are depressive symptoms and general anxiety symptoms, which is often

what is underneath the PTSD symptoms. The specific PTSD symptoms targeted by this intervention are the re-experiencing in the form of nightmares and recurrent thoughts, avoiding the cues, feelings thoughts, and even situations that may remind the individual of the traumatic event. Other symptoms of PTSD addressed by CBITS are arousal that presents in the form of irritability, difficulty in sleeping, hyper vigilance, and poor concentration. Jaycox added that these symptoms may result to problems with everyday functioning, adding that PTSD is also often comorbid with depression, substance abuse and behavioral problems (Nielsen MB, 2015).

According to the theoretical rationale of CBITS was that exposure to traumatic events in itself had several negative effects such as depression, poor performance in school, decreased IQ, reduced grade point average, and reading ability, behavioral and problems in development, even in cases where the adolescents have not developed PTSD. This intervention therefore seeks to reduce symptoms of PTSD through cognitive restructuring, acquisition of skills, and social learning. This is postulated to result to improved psychosocial functioning and school attendance. The adolescents are also expected to achieve posttraumatic growth exhibited through the five domains in their lives (Olf M, 2017).

Cognitive behavioral intervention for trauma in schools is structured in three parts that has 10 group sessions for the adolescents, 1-3 individual sessions for those with severe PTSD, 2 optional sessions of parent education programs and 1 session of teacher education program as outlined in table 2.1. Each session is required to last for 45 to 60 minutes. In this study however, the individual sessions will not be offered to ensure that there is no bias due to some participants getting more individualized attention. Further, CBITS has been noted to have some advantages over other interventions according to that include the fact that it is well structured and therefore allows the therapist to set agenda for the session. The structure includes activities, new skills and opportunity to practice the old ones, and activities assignment. Some of the skills that are learned from CBITS include relaxation skills, cognitive restructuring by combating negative thoughts, addressing fears, developing a trauma narrative, social problem solving, and reducing avoidant coping strategies (Ossa FC, 2019).

Secondly, the therapist is required to collaborate with the client and to act as a 'coach' to assist the client in developing new skills through didactic representation, so they learn to practice them effectively. The adolescents were also given age-appropriate examples and introduced to games that help solidify the concepts learned. The third advantage that this intervention has over other interventions is that it emphasizes on new techniques during sessions and even between sessions to help consolidate skills learned in the group. This intervention also incorporates both group and

individual sessions, in addition to parents and teachers sessions. Finally, this intervention is short and therefore enables the client to continue to practicing on their own even after the intervention is completed. The structure of the CBITS manual therefore seems to be designed to encourage deliberate rumination which is a key factor in alleviating the symptoms of PTSD. On the other hand, according to a process of cognitive processing occurs through the activities with the participants accommodating new positive assumptions resulting to a new assumptive world which is critical for restructuring the negative assumptions associated with PTSD (Paul O, 2019).

The objective of using this model was to support and strengthen the natural resiliency of young adolescents who are continuously under exposure to traumatic events due to the nature of their living environment. The manual was designed to provide the children impacted by trauma with information to enhance sharing of experiences, ideas and thoughts about the traumatic experiences, and to help the children build coping skills. These skills were intended to empower them to handle life's adversities, besides improving their self confidence and self-esteem (Sareen J, 2014).

This model has another advantage tied to the fact that it is offered in a school setting. According to a review about responding to students with PTSD in schools, it was reported that school-based services may be important for communities that are less likely to access this type of services, besides enhancing the completion of the intervention. This study was carried out in an informal settlement where the accessibility of mental health care may be a challenge and therefore such an intervention was purported to be practical in offering solutions to this population. Since the adolescents in informal settlements are continuously exposed to traumatic events, it would not be enough just to treat or reduce the symptoms of PTSD, but to equip them with coping skills to help them manage future traumatic events. A cognitive behavior intervention for trauma in schools-model would therefore be appropriate to give the adolescents information about the trauma they are exposed to, why they react the way they do, and how they can cope better. CBITS is an evidence-based intervention that uses skills building and early intervention approach and was seen to be effective in a randomized controlled study. It was evaluated by the National Registry of Evidence-based Programs and Practices receiving ratings in its outcome of 3.4 out of 4.0 for psychosocial dysfunction, 3.0 out of 4.0 for Depression and 3.1 out of 4.0 for PTSD. The first use of CBITS was in school year and has since been used with different populations to alleviate symptoms of varied traumas. The studies that have been carried out on CBITS were with students from schools located in areas that had a socioeconomic disadvantage. These areas had a population consisting mostly of African American and Latino adolescents who had been exposed to different forms

of violence that led them to having symptoms of PTSD of clinical levels. One study by revealed an improvement in school attendance and academic performance by the end of the school year among the adolescents.

As an intervention, CBITS was noted to produce moderate to large effect sizes of -.25 and -.63 on Anxiety and Posttraumatic stress among adolescents in a study that was done in San Francisco. The same study revealed moderate to large effect sizes of -.22 to -1.35 on internalizing and externalizing behaviors among the same population. With the evidence of CBITS programs resulting to statistically significant reduction in PTSD symptoms, functional problems, anxiety and somatic complaints, it was therefore postulated that after a CBITS intervention with adolescents in an informal settlement, there would be a reduction in PTSD symptoms and an increase in posttraumatic growth.

Two studies were also carried out to test the effectiveness of CBITS in alleviating PTSD symptoms among adolescents. In the first study, 31 % of 879 Spanish-speaking immigrants had PTSD and only 152 completed the study, and were found to have improved PTSD symptoms compared with 46 participants in the waitlist at three month follow-up. In the second study that consisted of 769 children who were 10-12 years old, 21 % of the participants exhibited positive symptoms of PTSD. The participants at the end of the study were 126 and they reported reduced PTSD and depression symptoms posttest. The parents also reported reduced behavioral problems post-test. Several other programs have been implemented to curb this dire situation of PTSD where mostly girls are empowered and taught life skills. In addition to life skills, the girls are taught topical issues on puberty and sex, changing gender roles and norms, sports and physical activity. The girls are also educated on how to reduce child marriages especially in communities where the girls are more vulnerable, improving mental health and nutrition, and financial education. Some of these programs include; 'Bright Future' in urban Ethiopia, 'Girls Awaken' in urban Burkina Faso, 'SAFE' in urban Bangladesh, 'Parivartan' in urban India, and lastly 'AGI-Kenya' in rural and urban Kenya. AGI- Kenya is an acronym for adolescent girls initiative in Kenya who concentrate on training the girls on how to prevent violence, how they can be more healthy and how they can create wealth to improve the overall well-being of adolescent girls in Kibera slums and the marginalized area of Wajir. These programs however, do not concentrate on the specific effects of PTSD and may not be effective if the underlying problems such as PTSD, depression, and anxiety are not addressed first.

This study was conducted as a group intervention in groups of 10 to 15 participants without the additional individual sessions offered to the participants with severe symptoms of PTSD to ensure uniform exposure to the intervention. Furthermore, school-based universal programs have been proposed to potentially serve as effective and significant

components of mental health policies especially for populations that are continuously exposed to trauma. It is for this reason that a group-based CBITS model to facilitate growth after the traumatic events the adolescents in informal settlements experience would be necessary. This would complement the available programs making them more effective and to fill the gap that exists of limited interventions to cater for the mental health of the adolescents in the informal settlements.

Therefore, the purpose of this study was to determine the effectiveness of CBITS in the treatment of PTSD among adolescents who attend selected public primary schools in informal settlements in Kajiado County, Kenya. This would contribute to the knowledge on effective school-based psychological interventions that can be applied among adolescents living in informal settlements in Kenya to help alleviate the symptoms of posttraumatic stress disorder.

METHODOLOGY

The research design adopted by the study was a quasi-experimental design to determine the effectiveness of CBITS in treatment of posttraumatic stress disorder among adolescents living and attending primary schools in informal settlements in Kajiado County, Kenya.

SAMPLE: Two primary schools were purposively selected for the study due to their location in informal settlements and the large population of students they had. Additionally, they were both located in Kajiado North sub-county and the respondents had similar socio-demographic characteristics. The total population of the two schools was 2345 from pre-primary to grade 8 with only 943 being in the target category of grade 5 to 7 according to school records.

Approvals for this study were sought from Daystar University Ethics and Review Board, Daystar University department of Human and Social Sciences, National Council for Science and Technology (NACOSTI) and the Kajiado County Commissioner in Kenya. Permission was also sought from the Head teachers of the two schools where the study was carried out.

A special assembly was then called separately in each school where the administration informed the students of the research. Following this, a meeting was organized where the researchers explained to the respondents the details of the research and they were given the opportunity to ask questions.

A total of 698 respondents met the criteria of being 10 to 14 years old in grades 5, 6, and 7. These respondents filled assent forms, were screened for PTSD using the Child PTSD Symptom Scale self-report (CPSS-SR-5). The school administrator provided informed consent for the respondents since they were all below 18 years. The mean age of the participants (N= 698) was 12.2 years (SD= 1.2), with 360

boys (51.6%) and 338 girls (48.4%). Out of a sample size of 212 achieved through simple random sampling from those who had 31 and above on the PTSD scale and were administered a Socio-demographic questionnaire, only 194 completed the study and their data applied in the analysis.

PROCEDURE AND METHODS: In the first school, the respondents were put in classrooms by streams with 9 groups having 40 respondents and one group had 30 respondents. Five research assistants who had been taken through prior training were each assigned two groups to administer questionnaires one after the other. The research assistants distributed the assent forms and explained to the respondents who then signed the forms if they were willing to take part in the study. The CPSS-SR-5 questionnaires and the SDQ were then distributed to the participants. The questions were each read out loud to the respondents who were then given time to answer each question. This method was adopted to ensure that the participants understood each question, asked for clarification, had enough time to answer the questions and to ensure there were no missing values.

SOCIO-DEMOGRAPHIC INFORMATION: The socio-demographic variables that were queried by the use of the SDQ included the age, gender, grade, religion, and school attendance. The participants were also asked what their primary language of communication was and the number of friends they had in school and at home. With regard to the family set up, the questionnaire asked whether both biological parents were living together, or they were living with a step parent. It also enquired if the parents were separated, divorced or whether they were living with a single parent or a guardian. To gather information on exposure to violence, the participants were asked if they had witnessed violence at home, at school or any other place. Further they were asked if they had personally experienced physical violence and if so, how frequently they had experienced the violence.

PTSD: The CPSS-SR-5 was applied to screen, diagnose and assess the presence and severity of PTSD among the participants. The 20 PTSD symptom items on the questionnaire were rated on a 5-point scale measuring frequency and severity with '0' indicating 'not at all' to '4' indicating '6 or more times a week'. In addition to this, there are 7 functioning items rated on 'yes' or 'no'. To calculate the total score of symptom severity, the 20 symptom items are used with scores of 0 to 10 indicating minimal PTSD, 11 to 20, mild PTSD, 21 to 40, moderate PTSD, 41 to 60, severe PTSD and 61 to 80 indicating very severe PTSD. The study included participants with scores of 31 to 60 at baseline indicating moderate to severe PTSD.

The CPSS-SR-5 was found to have a very good internal consistency for total symptom severity (Cronbach's alpha = .924) and a good test-retest reliability ($r = .800$). Further, the CPSS-SR-5 demonstrated a convergent validity with CPSS-I-5 ($r = .904$), and discriminant validity with the

Multidimensional Anxiety Scale (MASC) for Children and Child Depression Inventory (CDI). To identify probable PTSD diagnosis among children who had been assessed, a cut off score of 31 was recommended to be used. According to the past studies, the CPSS-SR-5 was therefore found to be a reliable and valid self-report instrument for diagnosing and assessing the severity of PTSD for children and those adolescents between the ages of 8 to 18, as per the symptoms outlined in the fifth edition of the DSM.

DATA ANALYSIS: To evaluate the effectiveness of CBITS, a paired-samples t-test was used to find out whether there was a statistically significant change in the mean scores for PTSD between the baseline, midline, and end line stages of the study. Three paired samples were created. The first pair compared midline PTSD scores against baseline PTSD scores, the second pair compared the PTSD scores at end-line against those at baseline, and pair 3 compared the end line and midline PTSD scores. The data was split into experimental and control groups to establish whether the treatment that was offered to the experimental group was effective.

RESULTS: This study had 698 respondents aged between 10-14 years where 48.4% were female, while 51.6% were male. Out of these, 212 were selected for the study through sampling with only 194 completing the study. With regard to their ages as shown in Table 1 below, 10.2% of them were aged 10 years, 18.6% were 11 years old, whereas 12 and 13 years olds were 28.2% each with 14 year olds being 14.8% of the screened respondents. The respondents in the study were attending the primary schools in classes 5 to 7, with 75 respondents (38.7%) from class 5, while 34% and 27.3% of the respondents were in grades 6 and 7 respectively. The responses revealed that 38.1% of the respondents were Protestant followed by Catholics and other denominations at 25.3% each. Of the remaining respondents, 7.2% belonged to the Seventh Day Adventist church while 4.1% were Muslims. This indicates that majority of the respondents were Christians (95.9%) with a Muslim minority of 4.1%. Among the respondents who were Christians, there were more protestant than the other denominations with Seventh Day Adventists being the least in numbers (Table 1).

Analyses were carried out to determine the effectiveness of CBITS in treatment of PTSD. The data showing the means and standard deviations at all stages of the study were analyzed as shown in the subsequent (Table 2).

Table 2 reveals a decrease in the mean scores for PTSD from 43.42 at baseline, 35.29 at midline, and finally 33.74 at end line for the experimental group. On the other hand, the control group had the means scores for PTSD increasing from 44.28 at baseline, 45.12 at midline and 45.08 at end line.

To evaluate the effectiveness of CBITS, a paired-samples t-test was used to find out whether there was a statistically

Table 1.
Socio-demographic Characteristics.

		Count (N)	Percentage (%)
Gender	Male	90	46.40%
	Female	104	53.60%
Age	10	21	10.80%
	11	40	20.60%
	12	52	26.80%
	13	51	26.30%
	14	28	14.40%
Grade	5	75	38.70%
	6	66	34.00%
	7	53	27.30%
Religion	Catholic	49	25.30%
	Protestant (PCEA, ACK, AIPC)	74	38.10%
	Seventh Day Adventist	14	7.20%
	Muslim	8	4.10%
	Others	49	25.30%
	Total	194	100.00%

Table 2.
Means and standard deviation of PTSD.

Group Statistics	Grouping	N	Mean	Std. Deviation	Std. Error Mean
PTSD Score at Baseline	Experimental	95	43.42	8.717	0.894
	Control	99	44.28	10.623	1.068
PTSD Score at Midline	Experimental	95	35.29	12.422	1.274
	Control	99	45.12	12.251	1.231
PTSD Score at Endline	Experimental	95	33.74	13.122	1.346
	Control	99	45.08	14.527	1.46

significant change in the mean scores for PTSD between the base line, midline and end line stages of the study by creating three paired samples. The first pair compared midline PTSD scores against baseline PTSD scores, while the second pair compared the PTSD scores at end line against those at baseline, with pair 3 comparing the end line and midline PTSD scores. The data was split into experimental and control groups to reveal whether the treatment that was offered to the experimental group was effective as indicated in the table that follows (Table 3).

From the results in Table 3, there was a statistically significant reduction of -8.263 in the mean PTSD scores between the baseline and midline stages in the experimental group, with $t(94) = -6.091$, $p = 0.000$. Similarly, there was a statistically significant reduction of -9.821 in the mean PTSD scores between baseline and end line stages in the experimental group of participants, with $t(94) = -6.935$, $p = 0.000$. For the third pair, there was a reduction of -1.558 in the mean score for PTSD between midline and end line stages in the experimental group, however this change was not statistically significant, $t(94) = -1.24$, $p = 0.218$. The results of pair 1 and pair 2 are indicative of the fact that treating the respondents with CBITS led to a statistically

significant reduction in PTSD symptoms between baseline and midline stages.

Additionally, treating the respondents with CBITS also led to a statistically significant reduction of PTSD between baseline and end line stages. It can therefore be concluded that CBITS was effective in reducing the severity of PTSD as seen in the reduction of PTSD scores in the experimental group. Finally, the results of Pair 3 confirm that there was no statistically significant change in the PTSD scores between the midline and end line stages. This can be interpreted to mean that the levels of PTSD did not change much between midline and end line, indicating that the respondents maintained the gains they had garnered during the intervention.

However, for the control group of respondents, there was a statistically insignificant increase of 0.838 in the mean scores for PTSD between the baseline and midline stage, with $t(98) = 0.688$, $p = 0.493$. Similarly, there was a statistically insignificant change of 0.798 in the mean scores for PTSD between baseline and end line stages, $t(98) = 0.501$, $p = 0.617$. This was indicative of the fact that without treatment, there was no significant change in the severity of PTSD among the participants in the control group. To

Table 3.

Paired samples Test for changes in the mean PTSD scores.

Grouping			Paired Differences					T	df	Sig. (2 tailed)
			Mean	SD	Std. Error Mean	95% Confidence Interval of the Difference				
						Lower	Upper			
EXP	Pair 1	PTSD Score at Midline - PTSD Score at Baseline	8.3	13.2	1.4	-11	-6	-6.1	94	0
	Pair 2	PTSD Score at	-9.8	13.8	1.4	-13	-7	-6.9	94	0
		End line – PTSD Score at Baseline								
	Pair 3	PTSD Score at End line – PTSD Score at Midline	-1.6	12.2	1.3	-4	0.9	-1.2	94	0.2
CON	Pair 1	PTSD Score at Midline - PTSD Score at Baseline	0.8	12.1	1.2	-2	3.3	0.7	98	0.5
	Pair 2	PTSD Score at End line - PTSD Score at Baseline	0.79	15.9	1.6	-2	3.9	0.5	98	0.6
	Pair 3	PTSD Score at End line - PTSD Score at Midline	0	11.3	1.1	-2	2.2	0	98	0.9

Table 4.

Independent samples t-test for PTSD scores.

t-test for Equality of Means									
		T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
							Lower	Upper	Cohen's d
PTSD Score at Baseline	Equal variances assumed	-0.6	192	0.5	-0.9	1.4	-3.6	1.9	0.09
	Equal variances not assumed	-0.6	187.5	0.5	-0.9	1.39	-3.6	1.9	
PTSD Score at Midline	Equal variances assumed	-5.6	192	0	-9.8	1.8	-13.3	-6.3	0.8
	Equal variances not assumed	-5.6	191.4	0	-9.8	1.8	-13.3	-6.3	
PTSD Score at Endline	Equal variances assumed	-5.7	192	0	-11.3	1.9	-15.3	-7.4	0.8
	Equal variances not assumed	-5.7	191.4	0	-11.3	1.9	-15.3	-7.4	

further evaluate the effectiveness of CBITS and to determine the effect size of the intervention, an independent sample t-test was run as indicated in the table that ensues (Table 4).

As indicated in Table 4, a Cohen's d of 0.09 at the baseline stage shows that the effect size was small. For the midline and end line stages, Cohen's d was 0.8 and 0.8 respectively showing that in each case the effect size was large, an indication that the intervention was effective in treating PTSD among the adolescents.

DISCUSSION

The study set to determine the effectiveness of CBITS in treatment of PTSD. A statistically significant reduction in the mean PTSD scores between the baseline and midline stages, and similarly between baseline and end line stages were established in the experimental group of participants. This was indicative of the fact that treating the respondents with CBITS led to a statistically significant reduction in PTSD symptoms between baseline and midline stages. The levels of PTSD did not change much between midline and end line, indicating that the respondents maintained the gains they had garnered during the intervention. With regard to

effect size, a Cohen's d of 0.089 at the baseline stage showed that the effect size was small. For the midline and end line stages, Cohen's d was 0.79 and 0.82 respectively showing that in each case the effect size was large, an indication that the intervention had a large effect size on the PTSD.

Similarly, a review of psychological therapies for treatment of PTSD among children and adolescents found CBT to have the best evidence of effectiveness for upto one month after treatment ended. In support of this was a systematic review in Brazil that confirmed the efficacy of cognitive behavior therapies for the treatment of posttraumatic stress disorder. Yet another review of therapies was carried out to address childhood PTSD that confirmed cognitive behaviorally-based therapies to be more effective in reducing symptoms of PTSD than non CBT interventions. In agreement with the findings, further systematic analysis of intervention for posttraumatic stress with children exposed to violence revealed that individual CBT interventions showed the most promise in alleviating symptoms of PTSS. Similarly, a meta-analysis of interventions for children and adolescents with PTSD found psychological interventions specifically TF-CBT, to be effective in reducing PTSD symptoms with medium to large effect sizes.

In addition to this, an adaptation of CBITS in American Indian communities in southwest exhibited reduced symptoms of depression and PTSD among the students. Congruent to these findings were the results of a study carried out in San Francisco among adolescents where CBITS produced moderate to large effect sizes of -.25 and -.63 on Anxiety and Posttraumatic stress . Further supporting these findings, a drive to implement CBITS in schools in USA had 350 children from diverse racial and ethnic backgrounds go through the CBITS intervention. The results agreed with those of this study revealing significant reduction in PTSD symptoms (42%, $d = .879$).

In Germany, a trauma-focused group intervention that is cognitive-behavior based named Mein Weg (My Way) was adapted and applied among young unaccompanied young refugees (UYR). The outcome of the study yielded significant reduction in posttraumatic stress symptoms (pre-intervention mean = 27.6, SD = 7.9; post-intervention mean = 20.7, SD = 6.3; $t(28) = 4.2$, $p = .001$, Cohen's $d = 0.97$) indicating the efficacy of the intervention with regard to reduction of PTSD symptoms . Another study among refugees with PTSD in Copenhagen reported positive outcomes of reduced PTSD symptoms when subjected to a highly structured CBT that incorporated mindfulness and acceptance therapy. Similarly in Iran, a study was carried out to examine the effectiveness of CBT in treating child victims of domestic violence that found CBT to be effective in relieving the symptoms of psychological effects of the abuse on the measured variables ($p = .001$). Moreover, a randomized controlled trial of teaching techniques of recovery among adolescents in rural Palestine revealed similar outcome. After the intervention, the adolescents had significantly fewer posttraumatic stress symptoms when compared to the waitlist group.

This organismic theory further posits that after one is exposed to a traumatic event, the cognitive-emotional processing may lead to assimilation, positive accommodation or negative accommodation. At baseline before the intervention, it is assumed that the adolescents who had gone through traumatic experiences accommodated the new information and therefore had trauma-related information that was not consistent with their pre-existing beliefs. This led them to revise their assumptions to take into account, the trauma-related information. Those who accommodated the information negatively with perceptions such as 'there will always be bad things happening and we have no control over them neither can we prevent them', were likely to develop depression and PTSD symptoms. This negative accommodation is often changed through cognitive processing drawn from interventions such as CBITS which may lead to the individuals assimilating the new trauma related information.

It is evident that CBITS facilitated the cognitive emotional processing leading to the alleviation of the PTSD symptoms as observed in this study. when assimilation occurs, trauma-

related information is perceived to be consistent with the pre-existing beliefs an individual had about the self and the world . This may explain the reduced symptoms of PTSD recorded in this study.

CONCLUSION

The findings of this study are indicative of the intervention, CBITS, being effective in reducing the PTSD symptoms with a high effect size (Cohen's $d=0.79$). Further, there was a statistically significant reduction in PTSD score (94)=[6.091, $p=0.000$] between baseline and midline. The findings of this study consequently revealed a positive outcome of CBITS on the symptoms of PTSD. This calls for the need to scale up school-based interventions, especially among adolescents who are at risk, such as those living in informal settlements, in order to cushion them against developing PTSD. Since the population in this study was very specific to the adolescents in informal settlements, it may restrict the generalizability of the study. However, the study applied a strict methodology and a standardized tool, the CPSS-SR-5 to measure PTSD. This improves the credibility of this study such that it can be generalized among similar and related populations such as adolescents in general.

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