THE CHILDHOOD TRAUMA QUESTIONNAIRE: VALIDITY, RELIABILITY AND FACTOR STRUCTURE AMONG ADOLESCENTS IN CALABAR, NIGERIA

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ABSTRACT

Introduction: Child abuse is a cause of increasing concern globally and is known to have significant negative effects on the physical and psychological well-being of children. Validated instruments for screening child abuse in Nigeria are scarce.

Aim: This study aimed to determine the validity, reliability and factor structure of the 28 item version of the Childhood Trauma Questionnaire among Secondary School students in Calabar South, Cross River state, Nigeria.

Methodology: In a cross-sectional study, a sample of 161 students was drawn from two secondary schools in Calabar South, Cross River State, using multi-stage technique. A socio-demographic questionnaire, the Childhood Trauma questionnaire (CTQ-28), the General Health Questionnaire (GHQ-12) and the Self-reporting Questionnaire (SRQ-20) were administered to the selected students. Convergent validity between CTQ and other scales, reliability using Cronbach alpha and the factor structure of CTQ using principal component analysis were assessed. The data was analyzed with the Statistical Package for Social Sciences, 21st edition (SPSS-21).

Results: Cronbach alpha was 0.80. Internal consistency for the subscales were 0.69 for emotional abuse, 0.60 for physical abuse, 0.60 for sexual abuse, 0.79 for emotional neglect and 0.21 for physical neglect. For convergent validity, correlation coefficients with the GHQ-12 and the SRQ-20 were 0.39 and 0.45 respectively ($p<0.05$). Principal Components Analysis yielded a four factor solution.

Conclusion: The 28 item version of the Childhood Trauma Questionnaire has acceptable reliability and validity and can be useful as a screen for child abuse among adolescents in Nigeria.

Key words: CTQ, validity, reliability, factor structure, adolescents
Running title: Validity and reliability of the Childhood Trauma Questionnaire

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INTRODUCTION

Globally, there has been a lot of focus on the well-being of children in recent years, with increased emphasis on child abuse and neglect. According to the World Health Organization (WHO), child abuse and child maltreatment are defined as "all forms of physical and/or emotional ill-treatment, sexual abuse, neglect or negligent treatment or commercial or other exploitation, resulting in actual or potential harm to the child's health, survival, development or dignity in the context of a relationship of responsibility, trust or power".[1] The WHO also recognises four forms of maltreatment, namely physical abuse, sexual abuse, emotional and psychological abuse; and neglect.[1]

The precise definition of what constitutes each form of abuse however varies across different cultures. While most of the Western world views hitting a child as abuse, Africans, including Nigerians will attest to the occasional spanking or slapping of an erring child as a necessary tool for discipline.[2,3] On the other hand, some superstitious harmful practices towards children are also fairly unique to Africa. Indeed, in Calabar, Nigeria and some of its neighbouring states, it is not unusual to hear of children being neglected, tortured or even killed, on the accusation of witchcraft.[4,5]

Although opinions of what can be termed child abuse may vary, there is a unanimous

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agreement as to its adverse effects on victims. These effects can be manifest in terms of physical and psychological illnesses. As the Adverse Childhood Experiences Study showed, abuse in childhood was linked to chronic physical illnesses as well as an increased rate of mental illnesses including depression, substance use and attempted suicides in adulthood. An increase in number of negative experiences was linked to a greater number and an increased severity of adverse outcomes later in life.[6,7]

There is a dearth of research on adverse childhood experiences in Nigeria.[8] Differences in cultural definitions of what constitutes child abuse and in methodological processes have contributed to this.

The Childhood Trauma Questionnaire was developed by Bernstein and Fink in 1998 as a 70-item screening inventory to assess self-reported experiences of abuse and neglect in childhood and adolescence.[9] In further studies, the length of the scale was reduced to 28 items based on exploratory and confirmatory factor analyses.[10] The short version of the CTQ is a self-report instrument assessing emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect.

The Childhood Trauma Questionnaire is one of the most validated and used instruments worldwide in assessing adverse childhood experiences.[11] Common uses of the CTQ are formulating treatment plans, conducting child custody investigations, and assessing special populations.[12] Its inherent properties including its ease of administration and brevity will be of great advantage to a low to middle income country like Nigeria, which has a high prevalence of childhood adversities but few mental health professionals.[13-16]

The purpose of this study is to validate the CTQ for use in this environment.

PARTICIPANTS AND METHODS

Study design and location

This study was cross sectional in design, conducted among Senior Secondary School students in Calabar, the capital of Cross River State. Calabar spans two local governments: Calabar South, which is the oldest part of the city and Calabar Municipality, which is the newer, rapidly developing region, formerly the outskirts of Old Calabar. There are eighty (80) senior secondary schools in Calabar, twenty-two (22) of them public while the rest are privately owned.

Sampling procedure

Secondary schools in Calabar South constituted the sampling frame. Data from the Ministry of Education revealed that there are 7 government owned schools and 27 privately owned schools in Calabar South. Multi stage sampling method was used. The schools were grouped on the basis of ownership (i.e. private or public) and one school was randomly selected from each group. Within the SS3 arms of each selected school, two classes were selected from the private school and three were selected from the government school, each class considered as a cluster from which all students were recruited. Using this approach, 161 students were recruited.

Study instruments

The Childhood Trauma Questionnaire (CTQ-28) is a 28 item self-report questionnaire designed by Bernstein et al, to retrospectively detect various childhood abuse experiences among adolescents or adults.[13] Domains of abuse assessed by the questionnaire include physical neglect, emotional neglect, emotional abuse, physical abuse and sexual abuse. Options for each question range from "never true" to "very often true", each rated on a 5-level likert scale according to the frequency of each assessed experience. The CTQ has been found to have good psychometric properties across many countries. It has been shown to have good reliability with internal consistencies ranging from 0.66 to 0.92 and good convergent

validity when compared to clinician rated interviews for child abuse.[9]

The Self Reporting Questionnaire (SRQ-20) is a 20 item questionnaire developed by a collaborative effort of WHO involving researchers in developing countries, designed for primary health care settings to screen for psychological distress.[17] It consists of 20 self-administered items which assess the symptoms experienced by an individual over the previous 30 days. The SRQ-20 items are scored 0 ('no', symptom absent) or 1 ('yes', symptom present). Item scores are summarized to obtain a total score. It has been validated for use in Nigeria.[18]

The 12-item General Health Questionnaire (GHQ-12) is the most widely used screening instrument for mental health problems and was designed by Goldberg et al.[19] The GHQ-12 comprises of 12 items which assess mood state and ability to function. There are four possible response options on each item which is described as follows; less than usual, no more than usual, rather more than usual, much more than usual. The 12 questions are scored on 4-point likert scale (0, 1, 2, 3) but during the analysis is collapsed to a dichotomous scale (0, 0, 1, 1). It has been validated for use in Nigeria.[20]

A sociodemographic questionnaire was administered to elicit variables such as age, sex, marital status of parents and educational attainment of parents.

Study procedure

Each selected school was approached for data collection after permission was previously obtained from the school principals, as well as consent from parents of students less than 18 years of age. Efforts were made to ensure that data collection would not interfere with academic activities of the student. During data collection period, each SS3 class was visited during the break period and objectives of the study were explained to the students. Voluntariness and strict confidentiality of data collection was emphasized. After sampling was done, study questionnaires were then administered to consenting students with the help of a trained research assistant. Data was collected over a period of 2 weeks. This procedure was repeated in each class of the selected school until data collection was complete.

Ethical consideration

Written approval to conduct the study was obtained from Cross River State Ministry of Education. Permission was also obtained from the Principals of the selected schools. Ethical approval was obtained from the Research Ethics Committee of Federal Neuropsychiatric Hospital, Calabar, Cross River state. Students less than 18 were given information forms and consent forms to take home to obtain parental consent for their participation in the study while those 18 years and above provided informed consent themselves. Participation was strictly voluntary and confidentiality both was assured and kept. This study was performed in accordance with the ethical principles enshrined in the Helsinki Declaration and the National Human Research Ethical code.

Data analysis

Internal consistency was determined by computation of Cronbach coefficient alpha. The minimum acceptable level of Cronbach alpha for a self-report questionnaire was assumed to be 0.6.[21]

For convergent validity, correlation of the Childhood Trauma Questionnaire with the General Health Questionnaire (GHQ-12) as well as the SRQ was examined using the Pearson product moment statistic (Pearson's correlation coefficient). Literature shows a correlation between childhood adversity and mental illness. A correlation between CTQ and measures of mental disorder screens (GHQ and SRQ) was therefore expected and would indicate convergent validity.[7]

To determine its factor structure, an exploratory factor analysis with direct varimax rotation was conducted. Statistical analyses were accomplished in IBM SPSS Version 22.

RESULTS

Most of the 161 respondents (62.1%) were between 12-15 years of age and 57.8% were female. The majority of students were from a government owned school (68.9%), were Christian (95.0%), had parents in monogamous marriages (76.4%) and had fathers (64.6%) or mothers (60.2%) who had attained at least tertiary education. This is displayed in table 1.

Table 1: Socio-demographic variables of all respondents.

VARIABLE	FREQUENCY n=161	PERCENTAGE (100%)
Age (yrs)		
12 – 15	100	62.1
16 – 19	61	37.9
Gender		
Male	68	42.2
Female	93	57.8
School type		
Public	50	31.1
Private	111	68.9
Religion		
Christian	153	95.0
Muslim	8	5.0
Marital status of Parents		
Married (monogamous)	123	76.4
Married (polygamous)	17	10.6
Separated/divorced	16	9.9
Not yet married	5	3.1
Father Education		
No Education	1	6
Primary	14	8.7
Secondary	38	23.6
Tertiary	104	64.6
I Don't Know	4	2.5
Mother Education		
No Education	1	6
Primary	17	10.6
Secondary	43	26.7
Tertiary	97	60.2
I Don't Know	3	1.9

Table 2 displays descriptive statistics for the CTQ in our sample. The mean score was 24.7 with a standard deviation of 10.6. The lowest score was 7 while the highest was 56. The 25th, 50th and 75th percentile scores were 16, 24 and 32 respectively. Cronbach alpha for the scale (also displayed in table 2) was 0.80. Internal consistency for the subscales were 0.69 for emotional abuse, 0.60 for physical abuse, 0.60 for sexual abuse, 0.79 for emotional neglect and 0.21 for physical neglect.

Table 2: Descriptives

Mean		24.7516
Std. Error of Mean		.83893
Median		24.0000
Mode		16.00
Std. Deviation		10.64485
Variance		113.313
Range		49.00
Minimum		7.00
Maximum		56.00
Sum		3985.00
Percentiles	25	16.0000
	50	24.0000
	75	32.0000
Reliability (Cronbach)		0.81

For convergent validity, correlation coefficients with the GHQ-12 and the SRQ-20 were 0.39 ($p<0.05$) and 0.45 ($p<0.05$) respectively. This is displayed in table 3.

Table three: Correlation statistics between CTQ-28, GHQ-12 and SRQ-20

Variables		**CTQ**
GHQ	Pearson correlation	0.39
	Sig. (two-tailed)	p = 0.000
SRQ	Pearson correlation	0.45
	Sig. (two-tailed)	p = 0.000

Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.75, suggesting that the items were appropriate for principal components analysis.[22] Rotation method was varimax. We used Catell's scree test, and parallel analysis using mean eigenvalues[23, 24] to determine the number of factors to retain, both of which suggested the retention of four factors, accounting for 43% of the variance.

Examination of simple structure indicates that five items (8, 17, 18, 24 and 26) had cross-loadings greater than 0.3 on more than one factor. Interpretation of factors based on item content suggested that Factor 1 most strongly reflects emotional neglect, Factor 2 reflects emotional abuse and physical abuse, Factor 3 reflects sexual abuse, and Factor 4 reflects physical neglect. Alpha coefficients for the factors were 0.83 (Factor 1), 0.78 (Factor 2), 0.62 (Factor I), and 0.50 (Factor 4).

Table four: Factor structure of the CTQ-28 after principal components analysis

ITEM	Factor 1	Factor 2	Factor 3	Factor 4
CTQ1				.458
CTQ3		.620		
CTQ4				.701
CTQ6				.702
CTQ8		.336		.476
CTQ9				.513
CTQ11		.616		
CTQ12		.527		
CTQ14		.705		
CTQ15		.626		
CTQ17		.462	.324	
CTQ18		.581		.307
CTQ20			.802	
CTQ21			.450	
CTQ23			.702	
CTQ24		.447	.390	
CTQ25		.556		
CTQ27		.384		
CTQ2	.630			
CTQ5	.650			
CTQ7	.769			
CTQ13	.718			
CTQ19	.722			
CTQ26	.563		.331	
CTQ28	.791			

DISCUSSION

Traditionally, the African society was thought to have very few, if any cases of child abuse. It was assumed that the loving and protective environment fostered by the extended family system practiced in Africa was a deterrent to the abuse of children.[25] Urbanisation and migration have led to an

erosion of the extended family system, possibly leaving in its wake child abuse and maltreatment as one of its consequences.

A UNICEF report painted a grim image as to child abuse in Nigeria, stating that 6 out of 10 Nigerian children experience some kind of violence, and 80% of these have repeated exposure to violent acts.[26] A large scale Nigerian study reported the prevalence, impact and antecedents of mental health disorders in a representative sample of adult Nigerians, aged 18 years and over. Their results showed a high prevalence of adverse childhood experiences as well as a strong association between these experiences and the development of mental disorders.[14] This was however a large, capital-intensive and interviewer-based study. There remains a need for a brief instrument that can be quickly administered in busy settings as a screen for childhood adversity. It was in a bid to bridge this gap that we investigated the reliability and validity of the Childhood Trauma questionnaire in a local population of adolescents.

In reliability analysis, the scale as a whole and all subscales except physical neglect, demonstrated acceptable internal consistency. Similar to our finding, several studies have almost consistently found the physical neglect scale to be the weakest, with low internal consistency.[10, 13, 27, 28] It has been suggested that the weakness of this subscale is related to problems inherent in the original construction of the CTQ.[29]

CTQ exhibited acceptable convergence with two screening tools for probable mental disorder, GHQ-12 and SRQ-20. Correlation coefficient was similar to the finding in a previous study which reported a correlation of 0.42 with the GHQ-12.[30] The CTQ has also been found to have significant correlations with other measures of mental disorder.[30]

We found a four factor solution on exploratory factor analysis, similar to other authors.[30-32] Items 2 and 28 loaded on Emotional neglect instead of physical neglect, as has been reported by some studies.[29, 33] The physical neglect factor which loaded 3 out of 5 from the original subscale, also loaded one item from the physical abuse scale (I got hit so hard by someone in my family that I had to see a doctor or go to the hospital) and another from the emotional abuse scale (I thought that my parents wished I had never been born) which also had significant cross-loading with its original scale (i.e. emotional abuse). On account of the item constituents of the physical neglect factor, it appears to be a pointer to a severe form abuse that is mostly physical in nature (physical neglect associated with extreme physical violence and extreme rejection). This factor however, had a low internal consistency and therefore is not strongly homogenous.

Emotional and physical abuse items loaded on the same factor, similar to previous reports[30, 34] Item 24 (Someone molested me) loaded on this factor. It is likely that as regards meaning, the word "molestation" is not given a sexual connotation in the local context. Other studies have found that it loaded on the physical abuse factor instead of sexual abuse.[35, 36] This item has caused some difficulty in studies where the scale had to be translated and was deleted in some cases.[37] Item 27 (I believe that I was sexually abused), which explicitly asks about sexual abuse also loaded on this factor. This may suggest it is very strongly associated with physical/emotional abuse.

It is worth noting that the original five factor structure of the scale as proposed by the original authors has been replicated in various populations and even across nations.[13, 37] However, it has been pointed out that studies conducted in countries where English is a second language reveal

differences in fracture factor.[37] Our study finding falls into the latter category.

CONCLUSION

Based on our findings, we conclude that the CTQ has acceptable reliability and validity to warrant its use in Nigeria.

LIMITATIONS

Our findings should be weighed considering the following limitations. Our sample size was quite small. A larger sample size, drawn from both local governments (i.e. Calabar South and Calabar municipality) would be more representative. Secondly, the CTQ is a self-report scale which retrospectively assesses the occurrence of child abuse. There is a risk of response bias due to poor recall of traumatic experiences or social desirability effects. Thirdly, this study was conducted among Secondary Schools students and this may limit its external validity.

CONFLICTS OF INTEREST

There are no conflicts of interest.

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