

## **VALIDITY AND RELIABILITY OF CHILD AND ADOLESCENT DISRUPTIVE BEHAVIOUR INVENTORY IN NAIROBI, KENYA**

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### **ABSTRACT**

The purpose of the study was to determine the validity and reliability of the Child and Adolescent Disruptive Behaviour Inventory (CADBI) developed by Burns (2001). In the study Quasi-experimental research design was applied. Purposive sampling was applied to identify the two schools. A sample size of 180 children aged between 9 and 14 years and who met diagnostic criteria for ODD was used. The respondents in the experimental group were treated using CBT for a period of three months while those in the control group did not receive any intervention. Demographic characteristics of the respondents were captured using questionnaires while teachers and parents of the children completed the Child and Adolescent Disruptive Behaviour Inventory (CADBI) V.2.3. The inventory had two forms CADBI: Parent (25 items) and CADBI - Teacher (25 items), each comprised of 3 subscales including Oppositional Defiant Disorder toward Adults, Oppositional Defiant Disorder toward Peers/Siblings, Attention Deficit Hyperactivity Disorder. First the teachers and the parents completed the forms of the selected sample of children aged 9 to 14 years. The reliability and validity was determined. An all item test for reliability was done using the Cronbach's alpha values and Kaiser-Meyer-Olkin (KMO) values in factors analysis. The CADBI tool showed Cronbach's alpha and KMO scores ranging from 0.8 to 1.0 indicating great and superb scores confirming the reliability of results both across and within the two groups. The study has implication in the field of child clinical psychology.

**Keywords:** Oppositional defiant disorder, attention deficit hyperactivity disorder, child and adolescent disruptive behavior inventory.

### **1.0 INTRODUCTION**

The objective of the study was to determine the validity and reliability of the scale for the assessment of disruptive behavior in children and adolescent. According to VandenBos (2007),

ODD is a childhood behavior disorder characterized by recurrent disobedient, negativistic, or hostile behavior toward authority figures than usually seen in children of similar age. It manifests as temper tantrums, active defiance of rules, dawdling, argumentativeness, stubbornness, or being easily annoyed. In a study by Major (2013), children with ODD are the consistently causing trouble. Their opposition to authority is often more than what would be considered normal for children of their age. For example, children with ODD would throw temper tantrums more often and with less provocation than children without ODD (Major, 2013).

The Child and Adolescents Disruptive Behavior Inventory (CADBI) versions 2 and 3 were developed by Burns, Taylor & Rusby (2001a). The CADBI Parent and Teacher version was filled by parents/caregivers and teachers because of their frequent interaction with the children at home and at school. The tool targets children and adolescents, where teachers and parents code the frequency with which a child engages in externalizing problems. The CADBI Screener is a brief parent- or teacher-report measure consisting of 25 items and 3 subscales: opposition directed towards adults (items 1-8); opposition towards peers (items 9-16); and hyperactivity/impulsivity (items 17-25); this measure was used in validation studies in children and youth 3- 18 years old.

The Scale gives the same description of symptoms as provided in the Diagnostic and Statistical Manual (5th ed., American Psychiatric Association [APA] 2013), but in more elaborative style. The more subjective anchors (e.g., never or rarely, sometimes, often, very often) are problematic because individuals who generating are free to define anchors as they choose (Burns et al., 2001; Schwarz, 1999). Alternately, frequency count rating anchors as introduced by Burns et al. (2001) in their rating scale (e.g., never in the past month, 1 to 2 times in the past month, 3 to 4 times in the past month, 2 to 6 times per week, 1 time per day, 2 to 5 times per day, 6 to 9 times per day, 10 or more times per 6 times per week, 1 time per day, 2 to 5 times per day, 6 to 9 times per day, 10 or more times per day) with short time intervals, preferably the past month, provide consistency and direction when rating symptoms.

According to Aysha and Najam, (2017) the CADBI has numerous benefits is that it has similar account of behaviors as presented by diagnostic criteria in the DSM-V. Another possible advantage involves the frequency count of the CADBI. According to Burns et al. (2001), a rating procedure based on frequency counts for a specific time interval is conceptually better way to measure these symptoms. With this procedure, the rating person indicates the occurrence of the symptoms on a frequency of occurrence scale (e. g., never, once, twice, once per month, once per week, once per day, and many times per day). Since the rating descriptors define frequency, this type of rating procedure reduces the ambiguity in response options, thereby, decreasing subjectivity in measuring procedures.

Establishing whether an instrument is valid and reliable is a very important aspect in research because this ensures that the tools used are standardized and can measure what was intended to measure. Validity is establishing whether the instrument content is measuring what it is supposed to measure (Mugenda, 2003). On the other hand, reliability was defined by Saunders, Lewis, and Thornhill (2009) as a measure of the degree to which a research instrument yields consistent results after repeated trials. CADBI can be used as a screening and diagnostic tool. Estimated time 5-10, The Scale reliability: internal consistency alpha =.91 to .97, Three-month Test-Retest is .86 to .94, Concurrent validity was found to be negatively associated ( $r = -.71$ ,  $p < .001$ ) with peer preferred social skills. Predictive reliability for parent and teacher versions has predicted direct observations of ADHD (Burns et al., 2001b; Burns et al., 2001a).

Gomez, Burns, Walsh, and De Moura (2003) reported the Cronbach's alphas of .87, .90, .93, and .84 for the ODD Adults, ADHD-HI, ADHD-IN, using the Portuguese version of the CABDI-P with Brazilian parents. A recent study using the Thai parent version of the CADBI with elementary school children reported Cronbach's alphas of .90(.91), .89(.89), .91(.92), .87(.87) for mother father ratings of the ODD-Adults, ADHD-HI, ADHD-IN (Burns et al. 2008). This same study reported similar alphas for these factors in a Brazilian sample (mothers: .89, .90, .93, .89 fathers: .89, .89, .94, .88) and in an American sample (mothers: .93, .92, .95, .91 fathers: .92, .90, .94, .93).

Further, a research carried out by Ted, Taylor, Rusby and Foster (2006) in several small to medium-sized communities in Oregon, ascertained that the relationship among the three main factors remained virtually unchanged. The model now achieved Hu and Bentler's conservative standards for adequate overall fit (for interval data root mean-square error of approximation = .054, standardized root mean square residual (SRMR) = .057, CFI = .92; for ordinal data root mean-square error of approximation = .069, comparative fit index (FI) = .96) (Ted et al., 2006).

The same analyses were rerun using the entire sample to generate best estimates of the relationship between the latent constructs. Oppositional to teachers correlated with oppositional to peers ( $r = .79$ ), oppositional to teachers correlated with hyperactive ( $r = .67$ ), and oppositional to peers correlated with hyperactive ( $r = .75$ ). In their findings, Ted et al. was noted that, although these latent constructs were highly correlated, they were not identical (Ted et al., 2006).

The study also established that the final model achieved adequate fit (for interval data root mean-square error of approximation RMSEA) = 0.047; SRMR = 0.053; CFI = 0.927; for ordinal data RMSEA = 0.062; comparative fit index (CFI) = 0.950). Support for the distinction among the three constructs would require the three-factor model (ODD-teachers, ODD-peers, and ADHD-HI).

In Ted, et al.'s study, oppositional toward adults and oppositional toward peers are distinct but correlated constructs and both are distinct from hyperactivity/impulsivity. All items load on their hypothesized constructs, which was further supported in a replication with a different sample of students. This three-factor structure demonstrated good fit for both boys and girls. All these findings show the construct validity of CADBI.

The researcher is in agreement with Taylor, Burns, Rusby, and Foster, (2006) who concluded that the CADBI 2.3, a new measure of disruptive behavior, holds promise as a useful assessment tool that offers a more fine-grained and reliable distinction between ODD to teachers and ODD to peers. Such a distinction may be useful in defining contexts in which to intervene, developing effective ways to intervene early, and measuring the effects of interventions. This is consistent with the APA, (2013) which pointed out that it is not uncommon for individuals with oppositional defiant disorder to show symptoms only at home and only with family members. Symptoms can be confined in one setting for example; at home, at school, at work or with peers. Some symptoms can be present in two or three settings. This is very important because children might manifest different behaviors toward the teachers and towards their peers.

## **2.0 METHODOLOGY**

Quasi-experimental research design was used in this study among children in the selected primary schools in Nairobi County. The SDQ was completed by 315 children; the CADBI was filled by the parents and teachers. A total of 249 respondents met the criteria for ODD out of which 180 were systematically sampled. Data from the study was collected from children ages 9–14 years after Assent/consent was obtained. In this study, Fisher's formula was used as cited by Fisher, Laing, Stoeckel, and Townsend (1991) to calculate the minimum required sample size, using mean and standard deviation estimates. Allowing for 10% attrition rate, the total sample size was adjusted upwards to 90.

During the study period a total of 4 respondents dropped out bringing the number of participants to 176. The respondent's socio-demographic questionnaire included the following variables: age, gender, class, religion, socio-economic status, academic performance, living with mother/father, step-parent, and grandparents) among other variables. The CADBI tool (both parents and teacher versions) were completed to help in the assessment of children with ODD. CADBI tool has proved to have good reliability and validity for describing ODD symptoms.

Statistical analysis was conducted using IBM SPSS version 23. Microsoft Excel was used in processing statistical output as well as construction of data tables and graphs. Descriptive statistics for frequencies was performed for the responses to determine the responses for the different categories. Prevalence of ODD was determined using the formula:

$$Prevalence (\%) = \frac{\text{number of students with ODD}}{\text{Total number of respondents selected for study}} \times 100$$

Significant association was reported at  $p < 0.05$ .

### 3.0 RESULTS

#### 3.1 Socio-Demographic Characteristics by age, gender and class

**Table 1: Distribution by Age**

Age	Baseline	Midline	Endline
9	5 (2.8%)	5 (2.8%)	4 (2.3%)
10	20 (11.1%)	20 (11.1%)	18 (10.2%)
11	41 (22.8%)	41 (22.8%)	40 (22.8%)
12	58 (32.2%)	58 (32.2%)	58 (33.0%)
13	43 (23.9%)	43 (23.9%)	42 (23.9%)
14	13 (7.2%)	13 (7.2%)	14 (8.0%)
Total	180 (100%)	180 (100%)	176 (100%)

Table 1 presents the distribution of the respondents by Age. The respondents were aged between 9 and 14 years of age. The respondents were categorized as those below 10 years, and those between 10-14 years of age. Most of the respondents were 12 years (32.2%), 13 (23.9%) and 11 (22.8%). The other ages were 10 (11.1%), 14 (7.2%) and 9 (2.8%) years respectively in a decreasing order. The numbers were similar in midline but declined at endline following the withdrawal of four (4) respondents from the study during the endline of the study. From the findings the majority of the respondents in the study were ages 12.

**Table 2: Distribution by Gender**

Timeline		Males		Females		Total
		N	%	n	%	
Baseline	Control	35	38.9%	55	61.1%	90
	Experimental	44	48.9%	46	51.1%	90
	Total	79	43.9%	101	56.1%	180
Midline	Control	35	38.9%	55	61.1%	90
	Experimental	44	48.9%	46	51.1%	90
	Total	79	43.9%	101	56.1%	180
Endline	Control	34	38.2%	55	61.8%	89
	Experimental	43	49.4%	44	50.8%	87
	Total	77	43.8%	99	56.7%	176

Table 2 presents the distribution of the respondents by gender. On the basis of gender, distribution was 77(43.3%) and 99 (56.7%) for males and females respectively from the table above the majority of the respondents were female who were the highest in the distribution compared to the male respondents. These indicated that there female students are more that the male respondents.

**Table 3: Class Distribution of the Respondents**

Class	4		5		6		7		Total
	N	%	N	%	N	%	N	%	
<b>Baseline</b>									
Control	7	7.8%	16	15.5%	18	20%	51	56.7%	90
Experimental	0	0.0%	32	37.9%	32	35.5%	24	26.7%	90
Total	7	3.9%	48	24.4%	50	27.8%	75	41.6%	180
<b>Midline</b>									
Control	7	7.8%	16	15.5%	18	20%	51	56.7%	90
Experimental	0	0.0%	32	37.9%	32	35.5%	24	26.7%	90
Total	7	3.9%	48	24.4%	50	27.8%	75	41.6%	180
<b>Endline</b>									
Control	7	7.8%	14	15.6%	18	20.0%	50	56.7%	89
Experimental	0	0.0%	33	37.9%	31	35.5%	23	26.7%	87
Total	7	3.9%	47	26.7%	49	25.6%	73	41.6%	176

Table 3 presents the distribution of the respondents by their academic level .On education level; the respondents were mainly distributed between classes 4 to class 7. Most of the respondents were in standard 7 (40.7%) with their numbers decreasing from standard 6 (27.7%), standard 5 (27.7%) and standard 4 (3.9%) respectively. The results indicated that the majority of the respondents were in class seven.

**3.2 Reliability of Measures - Cronbach’s Alpha**

Reliability test was conducted on each item measuring the different constructs (ODD Adults, ODD peers and ADHD) for this study. Cronbach’s alpha value is an important measure of correlations between the items belonging to a factor (Iacobucci & Churchill, 2010). Cronbach’s alpha has a maximum value of 1, and a higher value indicates high internal reliability or higher internal consistency. The Cronbach’s alpha value for the baseline survey teachers was between 0.9 and 0.97 indicating that the reliability strength of the teachers was superb while those of parents was great since it ranged from 0.81 to 0.89. The Cronbach’s alpha of all the items for the multiple constructs is .947 for the parents while teachers had a Cronbach’s alpha value of 0.884.

**Table 4: Cronbach’s Values for Reliability of Test Values Per Item**

Items	Baseline		Midline		Endline	
	Teachers N (180)	Parents N (129)	Teachers (N=180)	Parents (N=129)	Teachers (N=176)	Parents (N=129)
1.	.912	.887	.981	.977	.986	.972
2.	.916	.892	.981	.977	.986	.971
3.	.914	.886	.981	.977	.986	.970
4.	.913	.883	.981	.977	.986	.970
5	.915	.884	.981	.977	.986	.970
6	.917	.886	.981	.977	.986	.970
7	.916	.889	.981	.977	.986	.970
8	.918	.888	.982	.977	.986	.970
8a	.917	.890	.982	.978	.986	.971
9	.913	.887	.981	.977	.985	.971
10	.914	.889	.981	.977	.985	.970
11	.914	.885	.981	.977	.985	.970
12	.913	.883	.981	.977	.985	.970
13	.913	.884	.981	.976	.985	.970
14	.914	.888	.981	.976	.985	.970
15	.914	.889	.981	.977	.985	.970
16	.916	.890	.981	.977	.985	.970
16a	.918	.890	.982	.978	.986	.971
17	.914	.888	.981	.978	.986	.972
18	.914	.887	.981	.978	.986	.971
19	.914	.885	.981	.978	.986	.971
20	.915	.888	.982	.978	.986	.971
21	.913	.889	.981	.978	.986	.971
22.	.914	.883	.981	.978	.986	.971
23.	.915	.880	.982	.978	.986	.971
24.	.914	.882	.981	.978	.986	.970
25	.914	.883	.982	.978	.986	.971
25a	.917	.888	.983	.979	.987	.972

Table 4 presents the Cronbach’s values for reliability of test values per item .According to Hair, *et al.* (2007), Cronbach’s alpha coefficient of between .7 and .8 are good; 0.8 to 0.9 are considered great, and above 0.9 considered superb. Therefore, the reliability strength of the items of all the constructs ranged from great to superb.



**Table 5: Reliability Test Per Constructs**

Constructs	Baseline		Midline		Endline	
	Teachers (N=180)	Parents (N=129)	Teachers (N=180)	Parents (N=129)	Teachers (N=180)	Parents (N=129)
ODD Adults	0.891	0.819	0.970	0.976	0.969	0.937
ODD peers	0.862	0.760	0.970	0.975	0.980	0.953
ADHD	0.889	0.876	0.946	0.925	0.968	0.924
All Items	0.918	0.890	0.982	0.978	0.986	0.972

Table 5 presents the reliability test per construct. All construct items applied in the study were above the cut-off of .70, implying that the constructs are internally consistent and therefore measure the same concept Cronbach’s values per constructs were as presented in *Table 5* . Cronbach’s value of between 0.7 and 0.8 is good, while 0.8 to 0.9 is great and above 0.9 is superb. This shows that the constructs were reliable in measuring the respondents as required.

**3.3 Factor Reduction and Measures of Construct Validity**

An assessment of construct validity is useful since it measures the degree by which each chosen item measures accurately and reflects the constructs they are meant to describe (Saunders, *et al.* 2009). Construct validity is examined statistically by convergent validity and discriminant validity. Convergent validity examines if the statements that are expected to measure the same construct do in fact measure the same construct while divergent (or discriminant) validity examines whether the items that are expected to measure different constructs do in fact measure different constructs. Both convergent and divergent validity are evaluated by performing a factor analysis on the relevant constructs (Johannessen, *et al.* 2011). This is achieved by measuring Kaiser-Meyer-Olkin (KMO) measures sampling adequacy, Bartlett’s test measure for sphericity, eigen values, and the pattern matrix.

Interpretations of these statistical measures are done to ensure that the items being applied in each of the constructs fits perfectly in the constructs. In this case, the KMO values vary between 0 and 1. A KMO value of zero (0) is a very low value which indicates that the sum of partial correlation is large relative to the sum of correlation, indicating diffusion in the pattern of correlation; hence factor analysis is inappropriate for the data set measuring that construct. A KMO value close to one indicates that patterns of correlations are relatively compact and so factor analysis yields distinct and reliable factors. KMO values greater than 0.5 are acceptable while values below 0.5 indicate that either collection of more data should be done or redefine what variables to include in measuring the construct under the study. Classification of acceptable

KMO values between 0.5 and 0.7 are mediocre, values between 0.7 and 0.8 are good, values between 0.8 and 0.9 are great and values above .9 are superb.

Bartlett’s measure is another useful test. It tests the null hypothesis that the original correlation matrix is an identity matrix. In order for factor analysis to work, some relationships between variables are required and if the R-matrix is an identity matrix then all correlation coefficients are zero. Therefore, the test is significant, that is, it has a p value of less than 0.05 ( $p < 0.05$ ). A significant test indicates that the R-matrix is not an identity matrix; therefore, there are some relationships between variables included in the analysis.

**Table 1: KMO and Bartlett’s Test Values for all Item**

Measures	Baseline		Midline		Endline	
	Teachers	Parents	Teachers	Parents	Teachers	Parents
KMO	0.886 (Great)	0.805 (Great)	0.969 (Superb)	0.957 (Superb)	0.972 (Superb)	0.945 (Superb)
Bartlett test of sphericity	2809.422	1659.958	6641.441	5756.474	7642.174	3778.960
Df	378	378	378	378	378	378
Sig	0.000	0.000	0.000	0.000	0.000	0.000

KMO; Kaiser-Meyer-Olkin, df; degree of freedom, sig; significance

Table 6 presents the KMO and Bartlett’s test values for all Item. The KMO values of all the items for the multiple constructs in the baseline teachers survey is 0.886 which is a great score and Bartlett test of sphericity value of 2809.422 ( $df = 378; \rho < .000$ ) being significant. Comparatively, the parents survey also showed a great value at baseline with a KMO value of 0.805 with a Bartlett score of 1659.958 ( $df = 378; \rho < .000$ ). Similarly, the midline survey had a KMO value of 0.969 which is a superb value and a Bartlett test of sphericity value of 6641.441 ( $df = 378; \rho < .000$ ) being significant as well for the teachers.

A similar trend was also observed for the parents’ survey with a KMO score of 0.957 which is a superb score and a Bartlett score of 5756.474 ( $df = 378; \rho < .000$ ). In the endline survey, a KMO value for the teachers’ survey was 0.972 which is a superb value with a Bartlett test of sphericity value of 7642.174 ( $df = 378; \rho < .000$ ). Therefore, factor analysis is appropriate for this data. Equally, the parents endline survey produced a KMO value of 0.945 which was a superb score with a Bartlett value of 3778.960 ( $df = 378; \rho < .000$ ).

In summary, both of the teachers and parents’ survey had great scores for the baseline survey while both of the teachers and parents’ surveys for midline and endline surveys had superb

scores respectively. The KMO and Bartlett’s tests of sphericity were equally significant in all surveys ( $p < 0.000$ ). These suggest that factor analysis is possible for this study.

### 3.4 Construct validity analysis

The study sought to understand the validity of the construct under study. The three constructs included: ODD towards adults, ODD towards the peers and ADHD. This established whether the items identified in each of the constructs were a fit in answering the aspects of the constructs under the study.

**Table 7: Construct Validity Scores**

		Teachers			Parents		
	Measures	KMO	Bartlett	Sig	KMO	Bartlett	Sig
Baseline	ODD adults (N=36)	0.875	912.095	0.000	0.812	420.170	0.000
	ODD peers (N=36)	0.895	609.845	0.000	0.777	289.251	0.000
	ADHD (N=45)	0.893	810.894	0.000	0.870	581.669	0.000
Midline	ODD adults (N=36)	0.951	2154.059	0.000	0.959	2088.676	0.000
	ODD peers (N=36)	0.943	2277.318	0.000	0.952	2064.774	0.000
	ADHD (N=45)	0.931	1548.482	0.000	0.895	1100.064	0.000
Endline	ODD adults (N=36)	0.955	2088.232	0.000	0.918	1067.159	0.000
	ODD peers (N=36)	0.954	2782.251	0.000	0.941	1219.803	0.000
	ADHD (N=45)	0.962	2133.938	0.000	0.915	902.836	0.000

Table 7 presents construct validity scores. In line with the findings of the study, Analysis of KMO values for the individual constructs showed that the values were between Good and superb for all constructs. All items constructs KMO values and Bartlett tests of sphericity are presented. The teachers KMO values of ODD adults (0.875), ODD peers (0.895) and ADHD (0.893) were in the range of 0.8-0.9 which are acceptable values and ranked as great values for this study. The KMO values were improved to superb values in the midline survey with KMO values of 0.951, 0.943 and 0.931 for ODD adults, ODD peers and ADHD respectively. The KMO values were even more superb at endline for the teacher’s survey with KMO scores of 0.955, 0.954 and 0.962 for ODD adults, ODD peers and ADHD respectively. All the Bartlett score of sphericity were significant indicating that the factor reduction is appropriate for each of this constructs.

Similarly, the KMO values for parents in baseline survey has an ODD adults scores of 0.812 which is a great value, ODD peers score of 0.777 which is a good score and 0.870 for ADHD

which is a great value. The midline parent’s survey showed improved scores of 0.959 and 0.952 for ODD adults and peers respectfully which are superb scores for this study except for ADHD which had a score of 0.895 which is ranked a great score and marginally a superb value. In the endline study, all the construct items showed superb values for all; ODD adults had a score of 0.918, ODD peers had a score of 0.941 and ADHD had a score of 0.915 respectively. The Bartlett tests of sphericity were all significant indicating that factor analysis can be performed for each of these constructs.

### 3.5 ODD Adults Factor Analysis

ODD Adults items in the baseline, midline and end line survey were items 1 to 8a in the study. The individual Cronbach’s values and KMO score for the individual items contributing to the construct KMO values presented in in table 8.

**Table 8: Cronbach and KMO values for ODD Adults**

	Baseline		Midline		Endline		Teachers		Parents		Teachers		Parents	
	Cron	KMO	Cron	KMO	Cron	KMO	Cron	KMO	Cron	KMO	Cron	KMO	Cron	KMO
1.	.879	.859	.804	.883	.966	.923	.977	.946	.967	.960	.944	.824		
2.	.880	.886	.816	.866	.964	.964	.972	.969	.965	.948	.933	.910		
3.	.877	.857	.801	.773	.964	.959	.972	.966	.964	.950	.925	.933		
4.	.876	.851	.786	.775	.965	.965	.972	.958	.963	.970	.926	.916		
5	.876	.878	.784	.825	.964	.950	.972	.967	.962	.956	.925	.907		
6	.875	.880	.789	.870	.964	.957	.972	.971	.963	.942	.927	.959		
7	.872	.876	.798	.773	.964	.925	.971	.942	.964	.942	.925	.904		
8	.880	.884	.801	.773	.969	.925	.971	.925	.964	.954	.924	.895		
8a	.896	.923	.820	.832	.974	.982	.981	.982	.972	.972	.936	.959		

Table 8 presents the Cronbach’s alpha and KMO values for ODD towards adults. Each item in the baseline adequately contributed towards the constructs. The least Cronbach’s score was 0.874 while the highest score was 0.898 which are great scores of reliability as a measure of ODD among adults in the study for teachers. Similarly, the KMO scores ranged between 0.7 to 0.9 for both the baseline, mid line and endline survey for the study. Only item 3; *Refuses to obey adult requests or rules*, which received a score of 0.749 which is a good score for teachers in the baseline survey. The other items had scores ranging between 0.848 and 0.886 which is a superb value representing validity of the item in responding to main construct. Only item 8a had a score of 0.928 measured on a 3 Likert scale design for the study unlike the remaining 8 items for the

study of ODD adults. This score was a summary of the opinion of the respondent on ODD Adults items and suggests that items 1 to 8 are superb measures of validity for the items to determination of ODD in Adults. The question was phrased as follows; *Do the behaviors described in items 1 to 8 CURRENTLY cause significant problems for the child's adjustment?* Despite the presence of a few items that had mediocre scores, factors analysis can be performed for this study since mediocre scores just imply that they can be tolerated even though they may not be acceptable scores. Only values below mediocre scores are removed and should not be used in the study.

### 3.6 ODD Towards the Peers

The items 9 to 16a in the CADBI tool represented all the items measuring ODD towards the peers. Following factor analysis and test for reliability, the individual Cronbach's values and KMO score for ODD towards the peers for the individual items contributing to the construct KMO values presented in in table 9.

**Table 9: Cronbach and KMO Values for ODD Peers**

	Baseline		Midline				Endline					
	Teachers	Parents	Teachers	Parents	Teachers	Parents	Teachers	Parents	Teachers	Parents		
	Cron	KMO	Cron	KMO	Cron	KMO	Cron	KMO	Cron	KMO	Cron	KMO
9	.841	.912	.734	.893	.967	.915	.974	.960	.977	.958	.956	.959
10	.846	.915	.743	.738	.965	.938	.971	.938	.976	.940	.948	.934
11	.846	.889	.723	.754	.965	.957	.970	.936	.977	.940	.944	.923
12	.837	.885	.696	.744	.965	.925	.970	.955	.977	.979	.947	.946
13	.837	.901	.717	.796	.965	.969	.970	.971	.977	.957	.944	.949
14	.839	.873	.752	.792	.964	.962	.969	.962	.977	.960	.943	.936
15	.847	.881	.751	.788	.965	.927	.970	.943	.977	.942	.943	.928
16	.859	.892	.748	.748	.966	.932	.970	.934	.976	.940	.942	.934
16a	.870	.929	.762	.793	.975	.960	.979	.974	.985	.978	.954	.973

Table 9 presents the Cronbach and KMO values for ODD towards peers. Each item in the baseline adequately contributed towards the constructs. The least Cronbach's score was 0.837 while the highest score was 0.870 which are great scores of reliability as a measure of ODD among adults in the study for teachers. Similarly, the KMO scores ranged from 0.881 to 0.929 for the baseline survey. In the Parents survey, only item 12 was a mediocre value which meant that it could be tolerated but was not a good value for the Cronbach's scores. The other Cronbach's values were good values ranging from 0.717 to 0.752. This values are acceptable. All

items for ODD towards the peers had a KMO score ranging from 0.7 to 0.9 which implied that they were good and great scores, hence acceptable items for ODD towards the peers.

In the teachers midline survey, All the Cronbach's and KMO values were between the scores of 0.9 and 1 suggesting that they were superb scores of items measuring for the construct; ODD towards the peers. A similar finding was observed for the endline survey on all the items in both the endline teachers and parent's survey as shown in table 9. Hence, factor analysis can therefore be performed for ODD towards peers.

### 3.7 Attention Deficit Hyperactivity Disorder (ADHD)

The items 17 to 25a in the CADBI tool represented all the items measuring for ADHD. Following factor analysis and test for reliability, the individual Cronbach's values and KMO score for the individual items contributing to the construct KMO values presented in in table 10.

**Table 10: Cronbach and KMO Values for ADHD**

	Baseline		Parents		Midline		Parents		Endline		Parents	
	Teachers		Cron	KMO	Teachers		Cron	KMO	Teachers		Cron	KMO
	Cron	KMO			Cron	KMO			Cron	KMO		
17	.880	.936	.869	.905	.938	.937	.918	.847	.965	.968	.922	.881
18	.876	.867	.867	.837	.938	.929	.919	.795	.963	.958	.918	.915
19	.875	.889	.860	.875	.939	.934	.912	.901	.965	.955	.920	.903
20	.877	.889	.870	.906	.939	.957	.917	.943	.964	.969	.910	.929
21	.874	.879	.866	.852	.936	.947	.915	.921	.964	.958	.914	.927
22.	.876	.925	.853	.882	.940	.939	.915	.925	.963	.972	.913	.914
23.	.880	.875	.855	.858	.941	.940	.914	.942	.962	.953	.917	.884
24.	.877	.878	.858	.847	.939	.881	.917	.852	.963	.945	.910	.906
25	.873	.895	.859	.856	.939	.899	.915	.871	.963	.963	.912	.928
25a	.894	.918	.876	.910	.952	.974	.925	.958	.972	.980	.923	.948

Table 10 presents the Cronbach and KMO values of ADHD. Each item in the endline adequately contributed towards the construct; ADHD in both the teachers and parents surveys at baseline, midline and endline survey for the study as shown in table 10. The scores for Cronbach's alpha scores for all items from baseline to endline were above 0.8 suggesting that they were great values and hence, acceptable values for the study. Equally, the KMO scores ranged between great (above 0.8) and superb (above 0.9) values indicating that they were acceptable scores for the study. This suggests that factor reduction analysis could therefore be performed for the study.

#### **4.0 DISCUSSION**

This study was part of the main study which sought to determine the efficacy of cognitive behavior therapy among children with oppositional defiant disorder in selected primary schools in Nairobi County Kenya. The objective of this study was to determine the validity and reliability of the CABDI (Burns, 2010). The study was the part of the major study which sought to examine the efficacy of cognitive behavior therapy on oppositional defiant disorder among children in primary schools in Nairobi County, Kenya. The study measures of reliability using Cronbach alpha values showed that the values lied between great and superb values indicating that the tool was an appropriate for the study as shown in table 7.

Cronbach's alpha value is a reliable method for measuring the suitability of the CADBI tool in evaluating for ODD for the selected respondents for the study. Harada, Saitoh., Iida., Sakuma., Iwasaka., Imai., ... and Ohta. (2004) studies have also explored the use of Cronbach's alpha value as a measure of reliability and validity of the tool in measuring ODD among the selected study population. Several studies provide support for the reliability and validity of the CADBI as a measure of disruptive behavior (Burns, & Walsh, 2002).

Teacher ratings on the oppositional defiant behaviour, inattention and hyperactivity/impulsivity dimensions predicted observer ratings of the same dimension in a classroom, demonstrating the predictive validity of the CADBI (correlation coefficient  $r = .64-.69$ ). The same researchers also found test-retest values for the subscales at 3-month interval; (correlation coefficient  $r = .86-.94$ ) (Burns, & Walsh, 2002). The scale has demonstrated high levels of internal consistency (Cronbach's  $\alpha = .91-.97$ ), and structural validity (Burns, & Walsh, 2002).

Cronbach Alpha values for the various studies using the parent and teacher versions of CADBI showed the high reliability for mothers rating in Brazilian sample (CADBI-IN, - H/I, ODD-Adult, ODD-Peer, found Cronbach alphas (.93, .91, .90, .90 (Moura& Burns, 2010).

Similarly Taylor, Burns, Rusby, and Foster, (2006) in their findings reported that Oppositional to teachers correlated with oppositional to peers ( $r = .79$ ), oppositional to teachers correlated with hyperactive ( $r = .67$ ), and oppositional to peers correlated with hyperactive ( $r = .75$ ). Although these latent constructs were highly correlated, they were not identical. The final model achieved adequate fit (for interval data RMSEA = 0.047; SRMR = 0.053; CFI = 0.927; for ordinal data RMSEA = 0.062; CFI = 0.950 .This is consistent with the findings of his study.

#### **5.0 CONCLUSION**

The study findings showed that the CADBI tool was valid and reliable in screening for the children disruptive behaviors in Kenyan. Consequently, it can be used by mental health

professional and researchers to study disruptive behaviors of children in Kenya. The tool is ideal for the assessment of children with disruptive behaviors since the two versions would help in taking ratings from parents and teachers for the given child. This study has significant implications in the field of psychology.

## **6.0 LIMITATIONS AND SUGGESTIONS**

Due to the financial implication the study was not able to use a large sample size, future studies need to focus on larger sample across the country. Since the study was carried out in a slum setting in Nairobi all the parents were not available to complete the CADBI tool since most of them are casual laborers, they go out to look for jobs in order to provide the basic needs for their children.

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