THE ADOLESCENTS' PSYCHOSOCIAL FUNCTIONING INVENTORY (APFI): SCALE DEVELOPMENT AND INITIAL VALIDATION USING EXPLORATORY AND CONFIRMATORY FACTOR ANALYSIS

Onoja Matthew AKPA , Elijah Afolabi BAMGBOYE
(onojamatthew@yahoo.co.uk)
Department of Epidemiology and Medical statistics, College of Medicine, University of Ibadan, Ibadan, Nigeria
And
Olusegun BAIYEWU
Department of Psychiatry, College of Medicine, University of Ibadan, Ibadan, Nigeria

ABSTRACT
Most of the existing measures of psychosocial functioning among adolescents are developed outside Lower-middle-income countries (LMIC). Measures relevant to the LMIC setting will provide opportunity to assess the functioning of adolescents in these settings based on their background or context. The Adolescents' Psychosocial Functioning Inventory (APFI) which addresses relevant challenges and expectations of adolescents in the LMIC settings was developed to bridge this gap in knowledge. A total of 753 adolescents from purposively selected secondary schools participated in this study. Preliminary analyses were performed using descriptive statistics. The underlying factor structure of the APFI was explored using Exploratory and confirmatory Factor Analysis. Chi-square Goodness of Fit (CGF) and other fit indices were used to assess model fit. Cronbachs alpha was used to assess the reliability of the items and subscales of the APFI. The final model derived from the factor analyses yielded a 23-item three-factor model that provided the best fit to the data. Estimate of overall reliability of the APFI scale was $\alpha = 0.83$ *while all three factors/subscales: Optimism and Coping Strategy (OCS), Behaviour and Relationship Problems (BRP), and General Psychosocial Dysfunctions (GPD) had moderate to high reliability (*$\alpha = 0.59$ *for OCS,* $\alpha = 0.57$ *for BRP and* $\alpha = 0.90$ *for GPD). The CGF yielded* $\chi^2/df < 3$ *=1.58 while all other fit indices were in the acceptable range. The three-factor model APFI is a reliable measure for assessing psychosocial functioning among adolescents in the LMIC.*

Keywords: *Psychosocial functioning, Children and Adolescents, Scale development, Initial Reliability and Validity, Exploratory Factor analysis, Confirmatory Factor analysis*

INTRODUCTION
Psychosocial Well-being (PW) may be defined as a state of good mental health, social adaptation, or a combination of both (King, De Silva, Stein and Patel, 2009; Roberts, Odong, Browne, Ocaka, Geissler and Sondorp, 2009) while Psychosocial Dysfunction (PD) is the state of deviations from these normal human function. In this contemporary age, there are numerous psychological and social aspects of life that affect the ability of children and adolescents to manage daily functions. However, like many other intangible characteristics, measuring psychosocial factors may be a complex exercise and the best mechanism thought of may result in some inaccurate conclusions. Meanwhile, measures of psychosocial constructs are extremely required to assess PW and PD among adolescents and children (Zhou, 2012; Gilborn, Apicella, Brakarsh, Dube, Jemison, Kluckow, Smith and Snider, 2006) for a number of reasons. Theoretically based psychosocial constructs have been related to a number of developmental issues in children and adolescents (Norman, Carlson, Sallis, Wagner, Calfas and Patrick, 2010) while specific others such as difficult life events can permanently truncate a child's hope for the future. In past studies, psychosocial functioning have been reported to be dependent on internalizing problem behaviors, including lower levels of depressive symptoms, somatic problems, anxiety disorders and prosocial

behaviours (Liau, Chow, Tan and Senf, 2011; Silk, Steinberg, Morris, 2003). Other studies in sub-Saharan Africa, have reported association between a number of factors and psychosocial disorders among adolescents and young adults. For instance, among vulnerable youth in Rwanda, Zimbabwe, and South Africa (Gilborn et al., 2006; Moime, 2009; Zhou, 2012; Vermaak, Mavimbela, Chege, Esu-Williams, 2004; Brown, Rice, Boris, Thurman, Snider, Ntaganira, Nyirazinyoye, Kalisa and Nshizirungu, 2007; Horizon, 2004; Gilborn et al., 2006), girls were more likely than boys to report depression and low self-esteem as well as being affected by traumatic life events. Apart from that, failure on the part of parents, guardians and/or teachers to meet the psychological needs of children at any stage in their developmental process have been implicated in personality disorders (Moime, 2009).

There is increasing recognition that timely psychosocial interventions can make essential mitigating contributions to some mood disorders such as depression and anxiety as well as behaviour problems. Therefore, it is extremely important to assess the psychosocial functioning of children and adolescents for early detection of disorders and appropriate interventions. Though measures and facilities have been put in place in some developed countries to understand the extent of needs and for managing psychosocial problems among children with distressing experiences, the situations in many Lower-midle-income countries (LMIC) are lamentable. For instance, while several studies and measurement scales (for assessing PW and PD in certain populations) exist in some developed countries (Kovac, 1997; Goodman, 1997; Moberg and Hahn, 1991), comprehensive and validated scales focusing on LMIC settings are lacking in the literature. Hence, there is a great need for the development of scales with items relevant to the value system, experiences and background of adolescents in resources limited setting. This is particularly because existing (standardized) instruments in this area often contain items whose relevance and interpretations are inconsistent with prevailing realities in many developing nations. Nevertheless, it is important to note that in sub-Saharan Africa, study materials on psychosocial well-being developed in Uganda and Zimbabwe, had shaped later research in Rwanda where non validated measures of social support, grief, maltreatment, and marginalization were studied among youth headed households (Brown et al., 2007). However, a scale focusing on how adolescents think about their future or how confident they are about the future has rarely been studied in sub-Saharan Africa. Such information can provide understanding into the child's level of optimism particularly in the face of adversity and limited resources which often lead to frustration and low self-esteem known to affect children in this setting. In a study conducted in Bulawayo, Zimbabwe, nearly 80% of the participants reported confidence in themselves, capacity to help themselves and hopefulness for the future while another study in South Africa reported that vulnerable children were optimistic about their future (Gilborn et al., 2006; Moime, 2009). However, in addition to the obscurity in how the study outcomes were measured, psychometric properties of the measurement instruments were not provided.

In the present study, a comprehensive Adolescents' Psychosocial Functioning Inventory (APFI) for studying PW and PD in epidemiological studies of the included symptoms among adolescents in LMIC has been developed. Consequent on the obvious gaps in the literature, the PW focuses mainly on items that reflect a child's level of optimism about the future (and coping strategy in a resources limited background) while the PD focuses on the child's internalised behaviours and relationship with people, internalised shame, and hopelessness, among others. The psychometric properties of an initial conceptualization of the APFI are also tested in a sample of adolescents in a typical resources limited setting (Benue state, Nigeria).

GENERAL METHODS

Item generation and pretesting

Our initial conceptualisation of the APFI and subsequent item generation were based on both conceptual and empirical literature on PW and PD in the developed and developing countries (Negovan, 2010; King et al. 2009; Wren and Benson 2004; Brown et al., 2007a; 2007b; Horizon, 2004; Gilborn et al., 2006; Moime, 2009). After an extensive review of relevant literature, key informant interview (KII) were conducted with experts/researchers in the field of child and adolescents' mental health, psychiatry, community medicine, epidemiologist and statisticians. Also, KII were conducted among parents and adolescents in the study area. The interviews were intended to provide in-depth understand on issues that inform psychosocial functioning among adolescents in LMIC. The APFI was then initially conceptualized as consisting of three dimensions and seven sub-scales as follows: Psychosocial Wellbeing consisting of Optimism and Self Confidence as well as Coping Ability and Strategy; Psychosocial Dysfunction consisting of the Adolescents' Depression Inventory, the Internalised-shame Inventory for Adolescents and the Adolescents' Hopelessness Scale; Behaviours and Social Relationships consisting of the Peer Relationship Problems and the Delinquent Conduct Problems. Conceptually, the above characteristics are consistent with a series of studies conducted on the psychosocial issues related to children and adolescents in some countries in sub-Saharan Africa and other part of the world (Negovan, 2010; King et al., 2009; Wren and Benson 2004; Brown et al., 2007a; 2007b; Horizon, 2004; Gilborn et al., 2006; Moime, 2009; Liau et al., 2011). Although the compressive definitions (as identified above) were not strictly used in these studies, our preliminary work on the APFI ranging from reviews of other materials to discussions with adolescents in the study area identified these factors as critical to their developmental issues.

These initial exercises resulted in a preliminary pool of **64 items** for the APFI which was pre-tested among 138 secondary school students (52.9% males and 47.1% females with age ranging between 12 to 19 years) from a government (Public) school in Makurdi, Benue state, Nigeria. Based on the results of the initial reliability tests and Exploratory Factor Analyses (EFA), some items were removed due to low reliabilities, low factor loading and poor factor interpretability (Liau et al., 2011). These initial data exploration and analysis performed on the pre-test data were mainly used to refine the APFI to a **49-items** instrument and are not presented in the results contained in this paper.

Participants and procedures

The present study was conducted among five secondary schools (in Makurdi metropolis) purposefully selected for their sex composition and large number of students. A selected school typically has at least 1,000 students and is either a Boys-only (Private and public) school, a Gender-mixed (Private and public) school and a Girls-only (private and public - though a girls only private school with such capacity in the study area was not available for the present study) school. In the present study, one Girls-only (public) School (GOS), two Boys-only Schools (BOS) (one each from private and public school) and two Gender-mixed Schools (GMS) (one each from private and public school) were selected. The five schools were selected to capture the experiences of students in the various types of school. It is also envisaged that some contextual issues capable of informing psychosocial disparities may also influence the type of school parents and guardians send their children or wards. In addition, studies conducted among adolescents and young adults have utilized institutional platforms (Negovan, 2010; Liau et al., 2011; Lange et al., 2012; Bailey et al., 2011; Yang and Montgomery, 2011; Wei and Alvarez, 2010; Spanierman

and Heppner, 2004; Pinterits, Poteat and Spanierman, 2009). In addition to providing access to participants, school platforms also enhance our opportunity to reach adolescents and people from diverse social, cultural and family backgrounds (Pinterits et al., 2009; Lopez, 2004).
In a chosen school, every consenting student in a randomly selected class who agreed to sign the consent form after reading through the contents was given a self-administered questionnaire to fill in English language. Individual students filled a questionnaire independently of other class members. The age of participants ranges from 11 to 19 years with overall mean age of 15.30±1.52 years (further demographic details of the participants are listed in Table 1). Initially, a total of 766 students filled the questionnaire across the five schools. However, it was observed that 7 (0.9%) of the students were more than 19 years old. Reponses from these students were deleted completely from the dataset. Also, respondents with systematic responses (e.g. endorsing the same response for the entire survey) or complete missing values/no-response were also excluded from the dataset (Pinterits et al., 2009). This resulted in a final sample size of 753 students from the five schools combined. This dataset was randomly split into two for two separate statistical analyses: Study I (Exploratory Factor Analysis- EFA) and Study II (Confirmatory Factor Analysis-CFA).

Ethical considerations and approval
Ethical approval for this study was obtained from the University of Ibadan Institutional Review Board with the ethics approval number **UI/EC/12/0235. A**pproval for the study was also obtained from the Benue state Ministry of Health's ethical committee with the reference number **MED/261/VOL.1/56.** In addition to that, approval was also obtained from the authorities of the various schools that participated in the study while the school principals or designated officers of the institutions stood in as guardians for the participants. In addition, individual participants who provided verbal or written consent to participate in the study were advised to make their filling of the questionnaires private. Also, participating in the study was made voluntary and participants were free to withdraw from the study at any time without any consequence. Prior to data coding and entry, filled questionnaires were striped of every possible identifier, coded and collated by only the principal investigator and the trained research assistants.

STUDY I: EXPLORATORY FACTOR ANALYSIS

The purpose of study I was to first assess whether the data set to be used for this study was adequate for factor analysis. It was also of interest to study how the individual items of the APFI will load on the expected factors to be obtained in the EFA and to ultimately provide interpretable factors that will be used for the confirmatory factor analysis.

Participants
Participants for the Exploratory Factor Analysis (EFA) consisted of 368 adolescents randomly selected from the 753 adolescents. The 368 adolescents comprised of students (58.4% boys and 41.3% girls) from GOS (28.8%), BOS (45.4%) and GMS (25.8%). The sample consisted of students from the junior (28.5%) and senior (71.5%) secondary school classes and participants' ages range between 11 to 19 years (15.21±1.55 years). In terms of ethnic compositions, 45.1% were Tiv (the predominant tribe in the area), 23.4% were Idoma/Igede while 29.3% were adolescents belonging to other ethnic groups (like Igala, Igbo and Hausa).

Majority (80.4%) were being raised in homes with parents living together while 11.2% of them were under the care of single/divorced parents. Some of them (31.8%) have mothers who had completed tertiary education while 7.1% of them have mothers who have not completed any formal level of education.

Measures

Demographic survey
Participants completed demographic survey questionnaire indicating age, gender, ethnicity, place of residence (rural, urban), fathers' and mothers' level of education, fathers' and mothers' occupations, family type, family size and a few other items that could impact on their psychosocial state (Table 1).

The Adolescents' Psychosocial Functioning Inventory (APFI)
The 49-item APFI that was used to assess the aspects of PW, PD and BASR had a 3-points Likert-type response scale where 0 = not at all, 1 = sometimes and 2 = very often. Higher scores indicated better PW and worse BARP and PD. The scale was kept simple considering the difficulties that the students may encounter in rating questions with higher points scale. Moreover, some standardised scales for adolescents have used 3-point rating scale (Kovac, 1992; Goodman, 1997; Warnick et al., 2008)

Statistical techniques and analyses

Descriptive statistics, Reliability and factor retention techniques
Descriptive statistics and reliability tests (using the Cronbach's alpha) were computed for the 49 individual items of the APFI. Items negatively affecting the reliability measures of the subscales of the APFI (i.e. items if when deleted improves the reliability of the individual subscales of the APFI) were removed from further analysis. The Kaiser-Meyer-Olkin measure of sampling adequacy and the Bartlett's test of sphericity were conducted to indicate if the data were appropriate for EFA (Pinterits et al., 2009, Liau et al., 2011). Parallel analyses (based on normally distributed random data generation and permutations of the original data set) were conducted using 1000 random data generated from the original data being used for the EFA (O'Connor, 2000). A factor will be retained for EFA if its eigenvalue is larger than the average random eigenvalue obtained from the parallel analysis (O'Connor, 2000; Hayton et al., 2004; Pinterits et al., 2009). In addition, the Scree plot test, the amount of variance explained and the interpretability of factors were also fundamental issues considered for the number of factors to be extracted in the EFA.

The Exploratory Factor Analysis (EFA)
Exploratory Factor Analysis was conducted using Maximum-likelihood extraction with a direct oblimin rotation on the assumption that the factors were expected to be correlated. The factor pattern and factor structure coefficients for the APFI items were computed along with their communalities and the eigenvalues of the factors. Items should preferably load exactly or greater than 0.40 (in absolute value) on the relevant factor (pattern and structure) and less than 0.40 on all other factors (Liau et al., 2011; Yang and Montgomery, 2011) and each factor was then interpreted by examining the item content and the pattern of both factor structure and factor

pattern coefficients. Cronbach's alpha was computed to measure reliability of each subscale of the APFI represented by the identified factors.

Results of study I

Items mean score ranged from 1.51±0.69 to 1.74±0.52 while the reliability statistics (if item is deleted from the subscale) ranged from 0.47 to 0.86 for the APFI. The Kaiser-Meyer-Olkin measure of sampling adequacy for this study was 0.88 indicating that the data were appropriate for conducting factor analysis (Yang and Montgomery, 2011). The Bartlett's test of sphericity ($P<0.001$) also confirmed that the correlation matrix was not an identity matrix.
Prior to the oblimin rotation, 13 eigenvalues were found to be greater than 1.00. This resulted in too many and difficult to interpret factors but after rotation, the Scree plot suggested a three factor accounting for 33.59% variances in the APFI's score. Also, from the parallel analysis, only three eigenvalues (corresponding to three factors) from the original data set were larger than the average eigenvalue from the randomly generated data. Hence, three factors were extracted in the EFA.

Table 1: Sociodemographic information

Variable	Study I Frequency (%)	Study II Frequency (%)
Type of school		
Mixed school	95(25.8)	112(29.1)
Boys only	167(45.40	171(44.4)
Girls only	106(28.80)	102(26.5)
Sex		
Male	215(58.4)	233(60.5)
Female	152(41.3)	151(39.2)
Not reported	1(0.3)	1(0.3)
Age as at last birthday		
10-12	12(3.2)	11(2.9)
13-17	312(84.8)	334(86.8)
18-19	26(7.1)	26(6.8)
Not reported	18(4.9)	14(3.6)
Place of residence		
Rural	104(28.3)	107(27.8)
Urban	222(60.3)	229(59.5)
Not reported	42.0(11.4)	49(12.7)
Ethnicity		
Tiv	166(45.1)	174(45.2)
Idoma/Igede	86(23.4)	95(24.7)
Others	108(29.3)	111(28.8)
Not reported	8(2.2)	5(1.3)
Family type		
Monogamy	267(72.6)	269(69.9)
Polygamy	85(23.1)	87(22.6)
Not reported	16(4.3)	29(7.5)
Family status		
Parents are together	296(80.4)	298(77.4)
Parents live apart	20(5.4)	34(8.8)
Single/Divorced Parent	41(11.2)	40(10.4)
Not reported	11(3.0)	13(3.4)
Father's level of education		
No formal education	27(7.3)	26(6.8)
Up to Secondary	107(29.1)	104(27.0)
Tertiary	133(36.1)	137(35.6)
Others	88(24.0)	91(23.6)
Not reported	13(3.5)	27(7.0)
Father's Occupation		
Farming	53(14.4)	54(14.0)
Civil servant	168(45.7)	169(43.9)
Employee of Private organisation	42(11.4)	40(10.4)
Self employed	95(25.8)	104(27.0)
Not reported	10(2.7)	18(4.7)
Mother's level of education		
No formal education	26(7.1)	34(8.8)
Up to Secondary	137(37.2)	137(35.6)
Tertiary	117(31.8)	115(29.9)
Others	66(17.9)	76(19.7)
Not reported	22(6.0)	23(6.0)
Mother's Occupation		
Farming	61(16.6)	55(14.3)

Civil servant	99(26.9)	109(28.3)
Employee of Private organisation	40(10.9)	36(9.4)
Self employed	159(43.2)	168(43.6)
Not reported	9(2.4)	17(4.4)

Furthermore, 26 items/variables were dropped from subsequent analysis because some of them had negative impact on the reliability of the APFI while others had absolute loading on the three factors that were not equal to or greater than 0.40 (on both factor pattern and structure). Others were removed because they loaded more than 0.40 on more than one factor. On overall, only 23 items (Table 2) having absolute factor loading greater than 0.40 on not more than one of the three factors (with positive contribution to the reliability estimate of the factor/subscale on which they loaded) were retained for further analyses. In this study, the 23-item APFI was found to be internally consistent (Cronbach's $\alpha = 0.83$) while the three-factor solution (or subscales) met additional criteria such as factors containing a minimum of three items and exhibiting internal consistency. These were interpretable and fairly reflected our initial conceptualization of the APFI (Pinterits et al., 2009; Tabachnick and Fidell, 2007). The extracted factors for the APFI in this study were:

Factor 1: Optimism and Coping Strategy (OCS), the four-item subscale of APFI contains questions (such as "I feel that even though my parents/guardians are poor, I will be rich", "I hope a miracle will happen" etc) addressing how optimistic the participants are of their future situations despite their present state and a question on their coping strategy (Tables 2 & 3). The factor accounted for 7.25% of the variance in the APFI score and had a moderate measure of internal consistency ($\alpha = 0.59$). Mean score of items loading on this subscale ranged from 1.51±0.69 to 1.74±0.52 while reliability estimates (if item is deleted from the subscale) ranged from $\alpha = 0.47 \ to \ 0.57$.

Factor 2: General Psychosocial Dysfunctions (GPD), the 15-item subscale contains questions addressing adolescents' general psychosocial problems ranging from depressive symptoms (such as "I feel like running away from everything around me"); hopelessness (such as "Everywhere I turn, I see that my life is hopeless") to suicidal thought (such as "I thought of killing myself") (Tables 2 & 3). GPD accounted for 21.09% of the variance in APFI score and was internally consistent ($\alpha = 0.90$). Mean score of items loading on this subscale ranged from 0.20±0.48 to 0.51±0.58 while reliability estimates (if item were deleted from the subscale) ranged from $\alpha = 0.87 \ to \ 0.89$.

Factor 3: Behaviour and Relationship Problems (BRP), the four-item subscale contains questions (such as "I shout at people; even adults", "I use to break rules", etc) addressing the adolescents' behaviour and relationship disorder (Tables 2 & 3). The factor accounted for 5.26% of the variance in the APFI score and had a moderate coefficient of internal consistency ($\alpha = 0.57$). Mean score of items loading on this subscale ranged from 0.41±0.57 to 0.57±0.53 while reliability estimates (if item is deleted from the subscale) ranged from $\alpha = 0.46 \ to \ 0.53$.

Table 2: Rotated factor Pattern and Structure Matrices for the APFI

Item No.	Statement	Factor1 (OCS)		Factor2 (GPD)		Factor3 (BRP)	
		P	***S***	***P***	***S***	***P***	***S***
10.	I feel though my parents/guardians are poor, I will be rich	**0.48**	**0.49**	-0.06	-0.11	-0.06	-0.01
13.	I feel life will not continue to be difficult for me	**0.43**	**0.43**	-0.01	-0.07	-0.02	0.00
20.	I feel I may be nobody now but I will be a great person someday	**0.48**	**0.50**	-0.18	-0.20	-0.15	-0.06
2.	I hope a miracle will happen	**0.47**	**0.47**	0.02	-0.07	0.06	0.08
5.	I feel I am a disgrace to my family	-0.05	-0.13	**0.45**	**0.54**	-0.22	-0.39
14.	I feel like running away from everything around me	0.04	-0.04	**0.44**	**0.50**	-0.19	-0.35
15.	I find it difficult to sleep	-0.02	-0.09	**0.42**	**0.49**	-0.17	-0.33
12.	I feel like few years from now, I will be a total failure	-0.11	-0.21	**0.62**	**0.66**	-0.07	-0.31
21.	I feel guilty for all the difficulties in my family	0.02	-0.07	**0.52**	**0.59**	-0.18	-0.38
3.	I cannot see any light of hope in my future life	-0.19	-0.28	**0.57**	**0.60**	0.00	-0.22
19.	I feel like everything around me is falling apart	0.04	-0.04	**0.49**	**0.54**	-0.15	-0.33
9.	Everywhere I turn, I see that my life is hopeless	-0.10	-0.21	**0.84**	**0.78**	0.21	-0.11
16.	Judging from the situations in my family, I am hopeless	-0.14	-0.24	**0.65**	**0.66**	0.02	-0.23
18.	I feel my family is a shame to the community	-0.12	-0.23	**0.75**	**0.70**	0.20	-0.09
4.	I have too many problems; I cannot be free from them	0.02	-0.07	**0.50**	**0.55**	-0.14	-0.33
11.	I feel my presence causes distraction to people	-0.17	-0.25	**0.51**	**0.55**	-0.04	-0.24
17.	It is as if I am a burden to my family/community	-0.08	-0.17	**0.61**	**0.62**	0.00	-0.23
23.	I feel like things just wouldn't work for me	0.02	-0.09	**0.70**	**0.67**	0.05	-0.21
7.	I think of killing myself	0.03	-0.06	**0.57**	**0.58**	-0.05	-0.26
8.	People of my age hate me	0.08	0.04	0.09	0.24	**-0.43**	**-0.46**
1.	I break rules	-0.09	-0.11	-0.04	0.16	**-0.49**	**-0.48**
22.	I feel people of my age will take me for granted	0.15	0.10	0.21	0.35	**-0.44**	**-0.51**
6.	I shout at people; even adults	-0.16	-0.18	0.01	0.22	**-0.48**	**-0.49**

OCS: *Optimism and Coping Strategy*
GPD: *General Psychosocial Dysfunctions*
BRP: *Behaviour and Relationship Problems*
P: Pattern coefficients
S: Structure coefficients

STUDY II: COMFIRMATORY FACTOR ANALYSIS

The purpose of the Confirmatory Factor Analysis (CFA) was to test the factor structure of the APFI scores determined in study I with an independent sample using a CFA (Liau et al., 2011). It was also of interest to compare the hypothesized three-factor model (structure) with other competing factor models (Pinterits et al., 2009; Liau et al., 2011; Schmitt, 2011).

Participants

Participants for the Confirmatory Factor Analysis (CFA) consisted of 385 adolescents randomly selected from the 753 adolescents who participated in the study. The 385 adolescents comprised of (39.2% girls and 60.5% boys) students from GOS (26.5%), BOS (44.4%) and GMS (29.1%).

The sample consisted of students from the junior (26.8%) and senior (73.2%) secondary school classes and participants age ranged from 11 to 19 years (15.39±1.48 years). Most of the participants (45.2%) were Tiv, 24.7% were Idoma/Igede while 28.8% belonged to other (minority) ethnic groups in Benue state (Table 1).

Measures

The Adolescents' Psychosocial Functioning Inventory (APFI)

The 23-item APFI derived in study I was used for study II. Based on the outcome of study I, APFI had three subscales as described in study I: Optimism and Coping Strategy- OCS (4 items), General Psychosocial Dysfunctions- GPD (15-items) and Behaviour and relationship problems- BRP (4-items). Total Functioning Score (TFS) was computed as the sum of an individual's scores on the OCS, GPD and the BRP subscales of the APFI.

The Strength and difficulty Questionnaire (SDQ)

The 25-items SDQ (Goodman, 1997) is widely used in resource poor countries for measuring behaviour and emotional problems among children and adolescents (Zhou, 2012; Mullick and Goodman, 2001; Doku, 2009). The SDQ is a well validated measure, already translated into over 60 languages and used in over 40 countries to assess children's psychosocial outcomes (Doku, 2009). Items in the SDQ are rated on a 3-point Likert scale (Not True, Somewhat True, and Certainly True) and are divided into five subscales (with five items each) assessing different aspects of adolescents' psychosocial issues: Emotional Symptoms Scale (ESS), Conduct problems Scale (CPS), Hyperactivity Scale (HAS), Peer Problems Scale (PPS) and Prosocial Scale (PSS). Total Difficulty (or problems) Score of the SDQ (TDS) was computed as the sum of scores on the ESS, CPS, HAS and the PPS subscales of the SDQ.

Difference between the APFI and the SDQ

The SDQ is a mental health and behavioural screening tool for use with children and adolescents (age 4 to 17 years) in both clinical and community based sample (Palmieri and Smith, 2007; Per Håkan Brøndbo1,2*, Børge Mathiassen1,2, Monica Martinussen2, Einar Heiervang3, Mads Eriksen, Therese Fjeldmo Moe5, Guri Sæther6 and Siv Kvernmo, 2011; Goodman R, Ford T, Simmons H, Gatward R, Meltzer H, 2000). With no normative data for any country in the LMIC, each version of the SDQ includes between one and three of the following components: a 25 items on psychological attributes, an impact supplement and Follow-up questions. Comprising of the five subscales mentioned above, the SDQ generally measures externalising problems.

On the other hand, the APFI measures psychosocial issues related to adolescents (age 10 to 19 years) functioning in epidemiology or community based studies. The APFI was designed primarily for taking inventory of the included measures. And in contrast with the SDQ, the APFI consist mostly of internalized attributes except for the behaviour and relationship problems subscale.

Statistical techniques and analyses

The Confirmatory Factor Analysis (CFA)

Following the EFA results, a series of maximum-likelihood estimation of Confirmatory Factor Analyses (CFA) were conducted on the second sub-sample using AMOS 18.0. The purposes were to improve the model fit and compare the final (three-factor) model hypothesized in study I with other comparable or competing models (Liau et al., 2011; Yang and Montgomery, 2011). As suggested in the (Liau et al., 2011; Pinterits et al., 2009), the hypothesized model resulting from study I (three-factor oblique model) was tested against the following models: *independence model* (a three-factor orthogonal model assuming non-correlated three factors); *unidimensional model* (a one-factor model having all 23-items loading on a single competing factor); *three-factor with one second-order-factor model* (having the three-first-order factors subordinated to a single second-order factor); and *alternative/competing multidimentional model* (a two-factor model where the 4 indicators loading on OCS factor were retained and all the other 19 indicators loading on BRP and GPD were collapsed into one PD factor). In testing the model fit for the two-factor model in the present study, it was reasonable to collapse BRP and GPD owing to the strong positive correlation between the two factors; both factors were negatively correlated with the OCS with BRP having a non significant correlation.

Based on recommendations in past studies (Yang and Montgomery, 2011; Hu and Bentlers, 2000; Schmitt, 2011), multiple indices were used to evaluate model fit. A model is considered to be an adequate fit to the data when the following conditions are met: the chi-square statistics divided by the degrees of freedom is less than 3 ($\chi^2/df < 3$), the Goodness of Fit Index (GFI) is greater than 0.90 ($GFI > 0.90$), the Tucker-Lewis Index (TLI) is greater than 0.90 ($TLI > 0.90$), the Comparative fit index (CFI) is greater than 0.90 ($CFI > 0.90$), the Incremental Fit Index (IFI) is greater than 0.90 ($IFI > 0.90$), the Normed Fit Index (NFI) is greater than 0.85 ($NFI > 0.85$) and the Root Square Means Error of Approximation (RSMEA) is less than 0.05 ($RMSEA < 0.05$). Also, the Akaike Information Criterion (AIC), Consistent AIC (CAIC) and the Expected Cross Validation Index (ECVI) were as well used for model comparisons, with smaller values indicating a better fit (Akpa and Unuabonah, 2011; Kline, 2004; Yang and Montgomery, 2011).

Because the data violated the multivariate normality assumption, corrected p-values for the Bollen-Stine Bootstrapping (BSB) method (an AMOS based alternative to the Satorra-Bentler Scaled Chi-square test statistic) was used for assessing the overall model fit. In AMOS software, the BSB provides bootstrapping techniques for situations where the assumptions underlying maximum likelihood chi-squares and standard errors may be violated. In fact, for large samples, both AMOS and the Satorra-Bentler scaled Chi- square have been shown to have the same p-value with some simulation results confirming that bootstrapping is even better than the Satorra-Bentler scaled Chi-square (IBM, 2010; Fouladi, 1998; Nevitt and Hancock, 1998).

Relationships among included measures

Pearson's Moments Correlation Analysis was used to examine the inter-relationship between the three subscales of the APFI and the five subscales of the Strength and Difficulty Questionnaire (SDQ). This was intended to assess how the subscales of the APFI correlated with one another and with other related measures. The SDQ was selected because it has been used in past studies to evaluate problems related to psychosocial issues among children and adolescents in resources limited countries (Zhou, 2012; Doku, 2009). All analyses were performed at 5% level of significance using SPSS version 15.

Results of Study II

Descriptive Statistics and Reliability of Measures

In Table 5, average scores were 6.44±1.64, 5.01±5.66 and 2.05±1.59 for the OCS, GPD and BRP subscales of the APFI respectively while reliability estimates were $\alpha = 0.57$ (for the OCS), $\alpha = 0.90$ (for the GPD) and $\alpha = 0.63$ (for the BRP). Average scores and estimates of reliability for the ESS, CPS, HAS and PPS subscales of the SDQ were similar (Table 3) while average score and the reliability estimate for the PSS subscale were 6.74±2.22 and $\alpha = 0.68$ respectively. Also, the average scores (and reliability estimates) for the Total Difficulty Scores (TDS) of the SDQ and the Total Functioning Scores (TFS) of the APFI were similar: 13.88±6.64 ($\alpha = 0.83$) and 13.50±6.44 ($\alpha = 0.85$) respectively.

Table 3. Descriptive statistics and reliability estimates of the items and subscales of the APFI

Subscales and item statement	*Mean*	*SD*	*Scale Reliability if Item is deleted*	*Scale Reliability*
Optimism and Coping Strategies (OCS)	**6.44**	**1.64**		***0.59***
10. I feel though my parents/guardians are poor, I will be rich	*1.66*	*0.62*	*0.47*	
13. I feel life will not continue to be difficult for me	*1.51*	*0.69*	*0.49*	
20. I feel I may be nobody now but I will be a great person someday	*1.74*	*0.52*	*0.53*	
2. I hope a miracle will happen	*1.59*	*0.58*	*0.57*	
General Psychosocial Dysfunctions (GPD)	**5.05**	**1.60**		***0.90***
5. I feel I am a disgrace to my family	*0.23*	*0.48*	*0.89*	
14. I feel like running from everything around me	*0.51*	*0.58*	*0.89*	
15. I find it difficult to sleep	*0.47*	*0.57*	*0.89*	
12. I feel like few years from now, I will be a total failure	*0.23*	*0.51*	*0.87*	
21. I feel guilty for all the difficulties in my family	*0.37*	*0.57*	*0.89*	
3. I cannot see any light of hope in my future life	*0.26*	*0.54*	*0.89*	
19. I feel like everything around me is falling apart	*0.46*	*0.58*	*0.89*	
9. Everywhere I turn, I see that my life is hopeless	*0.27*	*0.52*	*0.88*	
16. Judging from the situations in my family, I am hopeless	*0.27*	*0.52*	*0.89*	
18. I feel my family is a shame to the community	*0.20*	*0.48*	*0.89*	
4. I have too many problems; I cannot be free from them	*0.32*	*0.53*	*0.89*	
11. I feel my presence causes distraction to people	*0.39*	*0.55*	*0.89*	
17. It is as if I am a burden to my family/community	*0.30*	*0.52*	*0.89*	
23. I feel like things just wouldn't work for me	*0.41*	*0.60*	*0.89*	
7. I think of killing myself	*0.24*	*0.50*	*0.89*	
Behaviour and Relationship Problems (BRP)	**2.05**	**5.66**		***0.57***
8. People of my age hate me	*0.47*	*0.54*	*0.53*	
1. I break rules	*0.57*	*0.53*	*0.48*	
22. I feel people of my age will take me for granted	*0.55*	*0.57*	*0.52*	
6. I shout at people; even adults	*0.41*	*0.57*	*0.46*	

Results of the Confirmatory Factor Analysis

The estimated path diagram with the standardized path coefficients, as well as the correlations coefficients between the latent variables for the hypothesized three-factor model is presented in Figure 1. The standardized path coefficients were all statistically significant and salient (>0.35) (Liau et al. 2011).

The chi-square goodness of fit test ($\chi^2/df < 3$=1.58) and more importantly, the p-value for BSB methods (0.178) for the hypothesized three-factor model was lower than all other competing models (except for the second-order model where the $\chi^2/df < 3$ was equal to that of the hypothesized model) (Table 5). The fit indices (TLI=0.94, CFI=0.95, IFI=0.95, GFI=0.93, NFI=0.87 and the RMSEA=0.039) and the information criteria (AIC= 457.43 and CAIC=700.14) confirmed that the hypothesised model fits the data used in the present study better than the competing models (Table 5). However, in comparison with the second-order model, the fit indices and the information criteria yielded the same estimates.

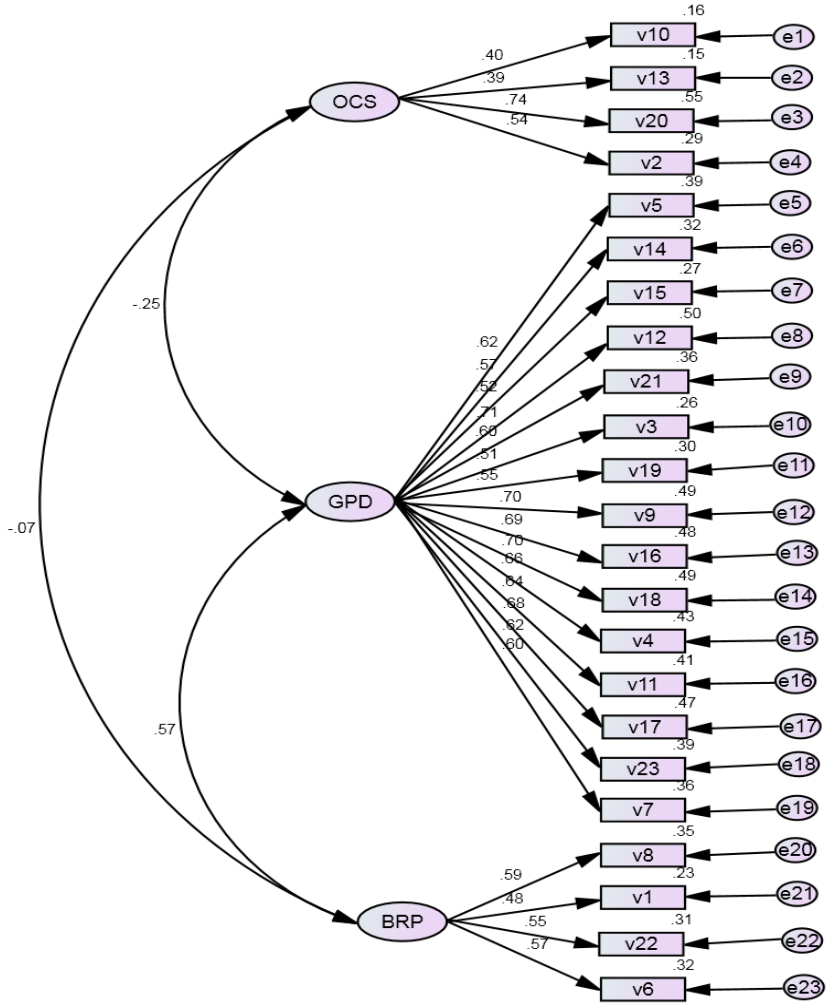

Figure 1: Confirmatory factor analysis of the three-factor model of the Adolescents' Psychosocial Functioning Inventory (APFI)

Interrelationships of included measures

Higher OCS scores were significantly correlated (r = -0.18, p<0.001) with lower scores on the GPD subscale of the APFI while higher GPD scores were significantly correlated (r = 0.444, p<0.01) with higher scores on the BRP subscale of the APFI. On the other hand, while higher scores on both GPD and BRP were significantly correlated with higher Total Functioning Score (TFS), scores on the OCS were not significantly correlated with TFS (Table 5).

In addition, higher OCS scores were significantly correlated (r = 0.23, p<0.01) with higher scores on the PSS subscale of the SDQ. However, higher scores on GPD were correlated with higher scores on all subscales of the SDQ (including the TDS) except PSS where higher scores on GPD were correlated (r = -0.12, p<0.05) with lower GPD scores. Also, higher BRP scores were found to be correlated with higher scores on all subscales of the SDQ (including the TDS) except PSS (Table 5). Furthermore, higher scores on all the subscales of the SDQ constituting the TDS (ESS, CPS, HAS, PPS) were correlated with higher scores on one another (Table 5) while higher scores on TDS was correlated with lower scores on the PSS (r = -0.18, p<0.01).

Table 5: Inter-correlations, Descriptive statistics and Reliability of Included Measure in the CFA

Scale	1	2	3	4	5	6	7	8	9	10	Mean	SD	Reliability
1. OCS	-										6.44	1.64	0.57
2. GPD	-0.18**	-									5.01	5.66	0.90
3. BRP	-0.04	0.44**	-								2.05	1.59	0.63
4. TFS	**0.08**	**0.94****	**0.62****	**-**							**13.50**	**6.44**	**0.85**
5. ESS	0.04	0.47**	0.37**	0.51**	-						3.45	2.22	0.65
6. CPS	-0.05	0.48**	0.36**	0.49**	0.55**	-					3.14	2.07	0.52
7. HAS	-0.07	0.47**	0.35**	0.48**	0.54**	0.55**	-				3.51	2.06	0.59
8. PPS	0.01	0.43**	0.32**	0.46**	0.51**	0.41**	0.46**	-			3.78	2.03	0.52
9. PSS	0.23**	-0.12*	-0.05	-0.05	-0.01	0.16**	-0.26**	0.14**	-		6.74	2.22	0.68
10. TDS	**-0.02**	**0.58****	**0.44****	**0.62****	**0.83**	**0.79****	**0.80****	**0.75****	**-0.18****	**-**	**13.88**	**6.64**	**0.83**

OCS-Optimism and Coping Strategy
GPD-General Psychosocial Dysfunctions
BRP-Behaviour and Relationship Problems
TFS-Total Functioning score
ESS-Emotional Symptoms Scale
CPS-Conduct problems Scale
HAS-Hyperactivity Scale
PPS-Peer Problems Scale
PSS-Prosocial Scale
TDS-Total Difficulty Score
**- Correlation is significant at 5% level of significance*
***- Correlation is significant at 1% level of significance*

DISCUSSION

The purpose of the present study was to construct and validate a comprehensive and self-reported (or as the case may be, interviewer-administered) research instrument, APFI for

measuring psychosocial functioning among children and adolescents in Economic and Resources Limited Setting (ERLS). Across two studies among adolescents and using contemporary methods, psychometric properties and supports for the development of a novel multidimensional scale, APFI is here reported. Supports were presented for the internal consistency of the scales and its subscales (three-factor structure) after rigorous assessments of other competing models documented in the literature (Liau et al., 2011; Pinterits et al., 2009; Yang and Montgomery, 2011). Also, results showing relationships between the subscales of the APFI and subscales of a related instrument (the SDQ) were also presented.

Past studies have considered psychosocial wellbeing and distresses among HIV affected youths in some sub-Saharan African countries (Gilborn et al., 2006; Moime, 2009; Zhou, 2012; Vermaak et al., 2004; Brown et al., 2007a; 2007b; Horizon, 2004) but the present development is intended for a broader population. Also, in previous studies, no hypothesis about factor structure and dimensions were made, and technical statistical considerations for a universal (population specific) usage of such materials were not provided. The present development therefore contributed to science by providing support for factor structures and dimensions for the proposed instrument (the APFI). It is also crucial for screening adolescents for PW and PD in the LMIC where most psychosocial issues of youths have been related to internalised problems (Gilborn et al., 2006; Vermaak et al., 2004; Brown et al., 2007a; 2007b; Horizon, 2004). While it is admitted that there are several standardized scales and subscales for measuring psychosocial issues among adolescents, the question of the local relevance of selected items in many of those scales remain unanswered. The APFI draws its strength from focusing specifically on the prevailing psychosocial experiences, the background and the situations of adolescents in LMIC.

Findings from the first study indicated a three-factor structure for the APFI scores, namely, OCS, GPD and BRP. The reliability estimates of the internal consistency for the subscales appeared to be moderate (for OCS and BRP) and good (for GPD). These domains well represent the situation of adolescents in LMIC for many reasons. First of all, existing studies in sub-Saharan Africa countries have documented a higher likelihood of problem behaviours among young people in the region (Akpan, Ojinnaka, Ekanem, 2010; Ndugwa, Kabiru, Cleland, Beguy, Egondi, Zulu, Jessor, 2011; Mugisha, Arinaitwe-Mugisha, Hagembe, 2003). Though the direct cause of the problem is uncertain, poverty has been implicated as a key factor (Wadesango, Chabaya, Rembe and Muhuro, 2011). In addition, adolescents in LMIC are most of the time overwhelmed by the lack of basic amenities of life. The quest to satisfy these basic needs in the face of poverty has created a perpetual expectations and coping strategy in a typical adolescents in this setting (Buckner, Mezzacappa, Beardslee, 2003; Roberts et al., 2009). Furthermore, though psychosocial issues among adolescents are very complex and multifaceted, the three domains or factor of APFI studied in the current study appear to further correspond to other related studies in sub-Saharan Africa. For instance, psychosocial issues such as being hopeful about the future, ability to cope, hopelessness, thought of suicide, feeling of guilt, behaviour problems and the likes have been identified as fundamental to adolescents in LMIC (Shilubane, Ruiter, Borne, Sewpaul, James and Reddy, 2013; Vermaak et al., 2004; Brown et al., 2007a; 2007b; Horizon, 2004).

It was found that all the standardized path coefficients in the path diagram for the CFA were statistically significant and salient. In addition, all the fit indices and the goodness of fit tests suggested that the hypothesized model fit the data well. Also, although the hypothesized three-factor model fit the data better than any other competing models, the single second-order factor

model also fit the data as well. This suggests that although psychosocial issues may be multidimensional, it can still be seen as one general construct of psychosocial functioning (Liau et al., 2011). However, based on our understanding of psychosocial functioning and the goodness of fit test (B-Sb), the hypothesized model represents the best model for the data.

Item selection for the final scale was based on three considerations: contents covering important issue(s) in psychosocial functioning, reliability of the item (measured by the contribution of the item to the reliability of the subscale) and the factor loading validated through the confirmatory factor analysis. By implication, an item must typically meet these criteria for it to be listed as an item in the subscales of the APFI. It was found that the final items selected in each subscale do not negatively affect the reliability estimate of the subscale and all items correlated well with the respective subscales.

Also, participants with higher scores on OCS were found to have lesser scores on GPD while those with higher scores on BRP, scored high on GPD. This interrelationship found in this study is consistent with previous empirical studies (Vermaak et al., 2004; Brown et al., 2007a; 2007b; Horizon, 2004; Gilborn et al., 2006; Moime, 2009; Zhou, 2012) among youth and vulnerable children across countries in sub-Saharan Africa.

The association of the APFI subscales with related constructs (SDQ) provided an additional understanding of the dynamics of psychosocial factors among adolescents (Table 5). The OCS was positively associated only with PSS subscale of the SDQ while the GPD subscale of the APFI was negatively associated with the PSS subscales of the SDQ. By implication, optimistic adolescents were social people while adolescents with psychosocial dysfunctions have tendencies for conduct and peer relationship problems. Past studies have reported that positive psychological traits and competences such as optimism, future focus and prosocial behaviours are interrelated and are very important to human functioning (Lyubomirsky, 2001). The correlations between OCS, BRP and the GPD subscales of the APFI and the subscales of the SDQ are similar across the subscales of the SDQ except for PSS. These further demonstrate the similarity between the two scales as measures of psychosocial symptoms.

It is worth noting that, although efforts were made to present accurate and comprehensive report in this study, the present study suffers some limitations. For instance, school proprietors and principals stood in as guidance for students <18 years of age. In addition, despite the fact that study I and study II consisted of data from different individuals, the data were collected together in a single survey and from individuals attending the same five institutions and hence were not entirely independent (Pinterits et al., 2009). Also, although the study was relatively balanced in respect of sex composition and type of school, adolescents from Girls-only private schools were not interviewed in the study. Future use of the APFI may consider applications in entirely independent samples with respect to some demographic and or contextual disparities. Studying the stability of scale items through Discriminant and Convergent validity is important to evaluating the validity of a new instrument. Unfortunately, in the current study, discriminant and convergent validity cannot be performed for the APFI as the design of the present study does not include a multimethod application of the APFI. Application of the APFI in a multimethod study design is a very important consideration for a future study involving the APFI.

Furthermore, the dimensions of APFI studied in the present work are not exhaustive. Past studies in sub-Saharan Africa (Vermaak et al., 2004; Brown et al., 2007a; 2007b; Horizon, 2004; Gilborn et al., 2006; Moime, 2009; Zhou, 2012) have shown that there are other factors capable of contributing to the psychosocial wellbeing or dysfunctions among adolescents in LMIC that were not considered in APFI. For instance, factors such as hopelessness and depression could uniquely contribute to the psychosocial state of any adolescent but they did not make unique subscales of APFI in the present study. A more elaborate study with wider scope may qualify such factors as unique factors of psychosocial functioning among adolescents in LMIC.

In summary, the present study has developed and reported preliminary supports for the reliability and validity of the scores on a 23-item APFI. The study has also responded to suggestion for the use of appropriate multivariable statistical procedures (including EFA and CFA) in the process of construct validation at the initial development of measures (Schmitt, 2011; Liau et al., 2011). The contents of the APFI are relevant to the local issues among adolescents in LMIC but could be adapted for other settings subject to modifications. The APFI is appropriate for assessing the included aspects of psychosocial experiences of children and Adolescents in LMIC and could provide useful information for policy decision focusing on the psychosocial needs of this population in any LMIC. The APFI can also be used (both at baseline and post interventions) for planning and evaluation of programmes or policies targeted at the included symptoms of psychosocial issues among children and adolescents in LMIC.

REFERENCES

Akpa, O.M., & Unuabonah, E.I. (2011). Small-Sample Corrected Akaike Information Criterion: An Appropriate Statistical tool for ranking of adsorption isotherm models. *Desalination*, 272, 20-26

Akpan, M.U., Ojinnaka, N.C. & Ekanem, E. (2010). Behavioural problems among schoolchildren in Nigeria. South *African Journal of Psychology, 16,* 50-55

Bailey, T.M., Chung, Y.B., Terrell, H.K., Williams, W.S., & Singh, A.A. (2011). Development and Validation of the Internalized Racial Oppression Scale for Black Individuals. *Journal of Counseling Psychology, 58*, 481–493

Brown, L., Rice, J., Boris, N., Thurman, T.R., Snider, L., Ntaganira, J., Nyirazinyoye, L., Kalisa, E.,& Nshizirungu, E. (2007). Psychosocial benefits of a mentoring program for youth-headed households in Rwanda. *Horizons Research Summary* (Washington, D.C.: Population Council); Retrived from www.popcouncil.org/pdfs/horizons/RwandaPsychOVCImpactSum.pdf

Buckner, J.C., Mezzacappa, E. & Beardslee, W.R. (2003). Characteristics of resilient youths living in poverty: the role of self-regulatory processes. *Developmental Psychopathology, 15*, 139–162.

Doku, P.N. (2009). Parental HIV/AIDS status and death, and children's psychological wellbeing. *International Journal of Mental Health Systems, 3,* 26 doi:10.1186/1752-4458-3-26

Gibbs, J.C., Potter, G.B., Barriga, A.Q., & Liau, A.K. (1996). Developing the helping skills and Prosocial motivation of aggressive adolescents in peer group programs. *Aggression and Violent Behavior, 1*, 283-305.

Gilborn, L., Apicella, L., Brakarsh, J., Dube, L., Jemison, K., Kluckow, M., Smith, T., & Snider, L. (2006). Orphans and vulnerable youth in Bulawayo, Zimbabwe: An exploratory study of psychosocial well-being and psychosocial support programs. *Horizons Final Report* (Washington, D.C.: Population Council). Retrieved from www.popcouncil.org/pdfs/horizons/zimorphans.pdf

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A Research Note. *Journal of Child Psychology and Psychiatry, 38,* 581-586.

Hu, L., & Bentler, P.M. (2000). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55.

IBM Statistics (2013). Satorra-Bentler Scaled Chi-square test statistic. Retrieved from http://www-01.ibm.com/support/docview.wss?uid=swg21476184

King, E., De Silva, M., Stein, A., & Patel, V. (2009). Interventions for improving the psychosocial well-being of children affected by HIV and AIDS. *Cochrane Database of Systematic Reviews, 2.* Retrieved from www.onlinelibrary.wiley.com/doi/10.1002/14651858.CD006733.pub2/pdf

Kovacs, M. (1992). *Manual of the Children's Depression Inventory.* Toronto: Multi-Heath Systems. Retrieved from http://www.acer.edu.au/documents/CDI-2-Parent-Assessment- Report-SAMPLE.pdf

Lange, J., Geiser, C., Wiedl, K.H. & Schöttke, H. (2012). Screening for personality disorders: A new questionnaire and its validation using Latent Class Analysis. *Psychological Test and Assessment Modeling, 54,* 323-342

Liau, A.K,, Chow, D., Tan, T.K. & Senf, K. (2011). Development and Validation of the Personal Strengths Inventory Using Exploratory and Confirmatory Factor Analyses. *Journal of Psychoeducational Assessment, 29,* 14-26

Lyubomirsky, S. (2001). Why are some people happier than others? *American Psychologist, 56,* 239-249.

Moberg, D.P., & Hahn, L. (1991). The Adolescent Drug Involvement Scale. *Journal of Adolescent Chemical Dependency, 2,* 75-88

Moime, W.M. (2009). The effect of Orphanhood On The Psychosocial Development Of Pre-Primary And Primary School Learners. *PhD Thesis. University of South Africa, Psychology of Education Department.* Retrieved From http://uir.unisa.ac.za/bitstream/handle/10500/2694/dissertation_moime_%20w.pdf?sequence=1

Mugisha, F., Arinaitwe-Mugisha, J. & Hagembe, B.O.N. (2005). Alcohol, substance and drug use among urban slum adolescents in Nairobi, Kenya. *Cities. 2003, 20*, 231–240.

Mullick, M.S.I., & Goodman, R. (2011). Questionnaire screening for mental health problems in Bangladeshi children: a preliminary study. *Social Psychiatry and Psychiatric Epidemiology, 36*, 94-99

Ndugwa, R., Kabiru, C., Cleland, J., Beguy, D., Egondi, T., Zulu, E. & Jessor, R. (2011). Adolescent problem behavior in Nairobi's informal settlements: applying problem behavior theory in sub-Saharan Africa. *Journal of Urban Health, 88,* s298–s317.

Negovan, V. (2010). Dimensions of students' psychosocial well-being and their measurement: Validation of a students' Psychosocial Well Being Inventory. *Europe's Journal of Psychology, 2,* 85-104

Norman, G.J., Carlson, J.A., Sallis, J.F., Wagner, N., Calfas, K.J., & Patrick, K. (2010). Reliability and validity of brief psychosocial measures related to dietary behaviours. *International Journal of Behavioural Nutrition and Physical Activity ,7,* 56.

O'Connor, B.P. (2000). SPSS and SAS programs for determining the number of components using parallel analysis and Velicer's MAP test. Behavior Research Methods, *Instrumentation, and Computers, 32,* 396-402.

Pinterits, E.J., Poteat, V.P., & Spanierman, L.B. (2009). The White Privilege Attitudes Scale: Development and Initial Validation. *Journal of Counseling Psychology, 56*, 417–429

Roberts, B., Odong, V.N., Browne, J., Ocaka, K.F., Geissler, W., & Sondorp, E. (2009). An exploration of social determinants of health amongst internally displaced persons in northern Uganda. *Conflict and Health, 3,* 10. doi:10.1186/1752-1505-3-10

Schmitt, T.A. (2011). Current Methodological Considerations in Exploratory and Confirmatory Factor Analysis. *Journal of Psychoeducational Assessment, 29*, 304-321

Shilubane1, H.N., Ruiter, R.A.C., Borne, B., Sewpaul, R., James, S., & Reddy, P.S. (2013). Suicide and related health risk behaviours among school learners in South Africa: Results from the 2002 and 2008 national youth risk behaviour Surveys. *BMC Public Health, 13,* 926

Silk, J.S., Steinberg, L., & Morris, A.S. (2003). Adolescents' emotion regulation in daily life: Links to depressive symptoms and problem behavior. *Child Development, 74*, 1869-1880.

Spanierman, L.B., & Heppner, M.J. (2004). Psychosocial Costs of Racism to Whites Scale (PCRW): Construction and Initial Validation. *Journal of Counseling Psychology, 51,* 249-262

The World Bank (2013). *Country and lending group*. Retrieved from http://data.worldbank.org/about/country-and-lending-groups

Vermaak, K., Mavimbela, N., Chege, J., & Esu-Williams, E. (2010). Vulnerability and intervention opportunities: Research findings on youth and HIV/AIDS in South Africa. *Horizons Research Update* (Washington, D.C.: Population Council. Retrieved from www.popcouncil.org/pdfs/horizons/nmcfythsum.pdf

Warnick, E., Bracken, M., & Kasl, S. (2008). Screening efficiency of the Child Behavior Checklist and Strengths and Difficulties Questionnaire: a systematic review. *Child and Adolescent Mental Health, 13,*140–147

Wei, M., Alvarez, A.N., Ku, T., Russell, D.W., & Bonett, D.G. (2010). Development and Validation of a Coping with

Discrimination Scale: Factor Structure, Reliability, and Validity. *Journal of Counseling Psychology, 57,* 328–344

Wren, D.G., & Benson, J. (2004). Measuring test anxiety in children: scale Development an internal construct validation. *Anxiety, Stress, and Coping, 17,* 227-240

Yang, Y. & Montgomery, D. (2011). Exploratory and Confirmatory Factor Analyses of the Multicultural Teaching Scale. *Journal of Psychoeducational Assessment, 29,* 261-272

Zhou, G. (2012). Understanding the Psychosocial Well-being of Orphans and Vulnerable Children (OVC): The Intersection of Research and Policy. *Undergraduate Thesis. Duke University-Durham, Sanford Institute of Public Policy Studies.* Retrieved from http://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/5386/Grace%20Zhou%20FINAL.pdf?sequence=1

Appendix

Table Abbreviations

Abbreviation	Full Meaning
AIC	Akaike Information Criterion
APFI	Adolescents' Psychosocial Functioning Inventory
BOS	Boys-only Schools
BRP	Behaviour and Relationship Problems
BSB	Bollen-Stine Bootstrapping
CAIC	Consistent Akaike Information Criterion
CFI	Comparative Fit index
CGF	Chi-square Goodness of Fit
CPS	Conduct problems Scale
ECVI	Expected Cross Validation Index
EFA	Exploratory Factor Analyses
ESS	Emotional Symptoms Scale
GDP	General Psychosocial Dysfunctions
GFI	Goodness of Fit Index
GOS	Girls-only public School
GSM	Gender-mixed Schools
HAS	Hyperactivity Scale
IFI	Incremental Fit Index
KII	key informant interview
LMIC	Lower-middle-income countries
NFI	Normed Fit Index
OCS	Optimism and Coping Strategy
OSC	Optimism and Self Confidence
PD	Psychosocial Dysfunction
PPS	Peer Problems Scale
PSS	Prosocial Scale
PW	Psychosocial Well-being
RSMEA	Root Square Means Error of Approximation
SDQ	Strength and difficulty Questionnaire
TDS	Total Difficulty Score
TFS	Total functioning score
TLI	Tucker-Lewis Index

Funding and acknowledgement:

****The project described in this study was supported by Award Number R24TW008878 from the Fogarty International Centre through the Medical Education Partnership Initiative in Nigeria (MEPIN). The authors are grateful to Mr. Stephen Onoja for technical supports in the field work and Data management.*

Corresponding author
Onoja Matthew Akpa (PhD) - email: onojamatthew@yahoo.co.uk
P.O.Box 14468, University of Ibadan, Post office, Ibadan