MODELLING PREDICTORS OF PSYCHOSOCIAL DISORDERS AMONG ADOLESCENTS IN SCHOOLS IN IKERE-EKITI LOCAL GOVERNMENT AREA, NIGERIA

BY

OGUNBOYO, OJO FEMI

MATRIC NO: 167791

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CERTIFICATION

I certify that this project was carried out by **Ogunboyo Ojo Femi** of Epidemiology and Medical Statistics Department under my supervision.

Akpa - 12/03/14

.....

(Supervisor)
Dr. O.M Akpa

DEDICATION

This research work is dedicated to the Almighty God for His grace and mercy in my life. And also to my parents: Late Pa Joseph Ogunboyo and my caring mother Mrs Kehinde Ogunboyo.

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Abstract

Background: The public health importance of mental health as a key component in child development has started to shape global health initiatives in the past few decades. Though past studies have assessed mental health issues in different age categories in Nigeria and elsewhere, understanding the psychosocial functioning among adolescents in school in the local settings could provide bases for further actions. This study sought to explore the factors affecting psychosocial functions among adolescents in schools in Ikere Ekiti.

Methods: Six schools were purposively selected out of the available fifteen secondary schools in Ikere LGA. Questionnaire comprising socio-demographic variables, Rosenberg Self-esteem scale, Strength and Difficulty Questionnaire (SDQ) and Center for Epidemiological Studies Depression for Children Scale (CES-DC) was used to obtain the demographic data and to screen participants for emotional and behavioural problems. Frequency Table and percentages were used for initial data exploration while correlation analysis, independent t-test, ANOVA and multilevel linear regression model were used for inferential analysis. All analysis were performed at 5% level of significance using SPSS version 20.

Results: A total of 480 adolescents (11-19years old) from six secondary schools participated in the study. More than 50% of the participants are males while 48.9% are female. Overall, 26% of the participants were depressed while 8.6% of the participants had abnormal behavioural difficulties. Also, mean score for depression (17.53±8.92) was significantly higher for male than for female (15.05±8.93). The subscales of the SDQ and CES-DC correlated significantly with one another while higher scores on self-esteem correlated significantly with lower scores in the subscales of the SDQ and CES-DC, except prosocial behaviour ($r=.0.114$, $p<0.05$) and positive affect ($r = 0.183$, $p<0.001$). Additionally, sex, self-esteem, emotional symptoms and conduct problem predicted depression among the participants in this study ($p<0.001$). Also, emotional symptoms and hyperactivity significantly predicted peer problems ($p<0.001$).

Conclusion: Psychosocial problems are more prevalent among male participants than their female counterparts. Also, psychosocial functioning of the participants was mostly affected by psychological state.

Key words: Psychosocial functioning, Modelling, Adolescence, Adolescents in schools.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

The growing awareness of the public health importance of mental health as a key component in child development has started to shape global health initiatives during the past few decades (Prince et al, 2007). It was estimated that about 450millions people suffered from mental health or behavioural disorders in the year 2010 (WHO, 2010) and it has been reported recently that mental disorders make a substantial contribution to the global burden of disease (Wikipedia, 2013).

Psychological difficulties have shown to affect children's abilities to fulfill their potentials even in developed countries (UNICEF, 2006, 2007). It has been predicted that the burden from depression alone is likely to increase to a single biggest burden of all health conditions by 2030 (WHO, 2004). However, mental health is seen as unimportant and isolated issue in most African countries though. 14% of the burden of disease in Africa has been attributed to mental health (Prince et al, 2007)

In sub-Saharan Africa, rates of psychological disorders among adults are particularly elevated, and studies have shown rates of posttraumatic stress disorder, anxiety, and depression ranging from 20% to 60% (Jamison, 2006) while the prevalence rate among children and adolescents are yet to be extensively diagnosed(WHO-AIMS, 2006). However, according to the United Nations, mental illness is 75% higher in youth in developing countries when compared to developed countries. Furthermore, recent study reported 14.3% prevalence of mental health disorders among children and adolescents in sub-Sahara Africa while 15.2% was reported for south west Nigeria (Taiwo, 2011). Although, Nigeria's mental health policy was first formulated in 1991 (and it

comprises advocacy, promotion, prevention, treatment and rehabilitation of patients (WHO, 2006)), information about the level of mental health service in Nigeria still remains hard to come by because systematic data gathering and collection are particularly non-existent.

Mental health illness is not only a disease but has also been described as a risk factor to other priority public health conditions such as obesity, diabetes, cardiovascular disease etc (Chapman et al, 2005, Fergusson et al, 2005). It was estimated that about 18 million (11.2%) Nigerians may be suffering from depression (WHO, 2010) while societal challenge has been suggested as the most likely cause. It has equally been reported that young children with these disorders may pretend to be sick, be overactive, cling to their parents and refuse to go to school. Older children and adolescents with depression may be silent, refuse to participate in family and social activities, get into trouble at school, use alcohol or other drugs, or stop paying attention in class and even to their appearances. They may also become negative, restless, grouchy, aggressive, or feel that no one understands them. Adolescents with major depression are likely to identify themselves as depressed before their parents or teachers begin to suspect that they are having the problem (CMHS, 1998).

1.2 PROBLEM STATEMENT

Across the globe, persons with mental problems are the most vulnerable and belong to the poorest group of people comprising about 450million people (WHO-MMWR, 2010). As a result of an insufficient data on mental health problem in sub-Saharan African countries, a group of researchers estimated a weighted average of mental disorder prevalence in six countries, including Nigeria, and reported that 14.3% of adolescents in the regions are suffering from mental disorders (Melissa et al, 2012). Furthermore, WHO's earlier report also showed that as many as 20% of the

world's children and adolescents experience a mental disorder at some stage before adulthood (WHO,2001) while the update of the global burden of disease (GDB) published in 2008 projected that by 2030, depression would be among the leading cause of GBD (WHO, 2011). Moreover, recent report showed that mental disorders accounted for 14% of the global burden of disease and 28% among non-communicable diseases (WHO, 2011).

Apart from this disturbing statistics, mental disorders have several economic consequences, not only for national health cost but also for workplace operations, lost of productivity, family budget and individual incomes (WMHD, 2011). Among children and adolescents, it has been found as a major cause of academic poor performance which might consequently give chance to truancy or droping-out. This can also affect life-long prospect if not checked on time (Hemingway and Marmot, 1999; Cheng and Furnam, 2002). Among people with other illnesses like HIV/AIDS, Diabetes, cancer (Scholten et al, 2011, Egede, 2007) etc as well as physically handicap people, the problem get worsened the more sufferer is subjected to mental stress like stigmatization and marginalization.

Furthermore, past research has shown that adolescents with depression are more likely to exhibit conduct problems (Ian Colman et al, 2009) while peer problem and conduct problem are more prevalent among boys than girls (Bakare et al, 2010) and that self-esteem has a negative correlation with depression (Bettge et al (2008).

1.3 JUSTIFICATION

It is evident that mental health disorders have enormous effects on adolescents globally. Emotional and behavioural problems are among the most prevalent chronic health conditions of childhood and often have serious negative consequences for a child's academic achievement and social development (Patricia et al, 2012). More also, psychosocial factors such as distressing life events or environmental stress (poverty, unemployment) and family functioning have been shown to particularly impact on depression disorders and other serious psychological problems among children and adolescents (Colman et al, 2009). However, it has been suggested that there is a dynamic and complex interplay between clinical and psychosocial factors that lead to mental disorders (Emler, 2001; Ajidahun, 2011).

Furthermore, factors like residential location and parental status disparities can influence children behaviour. Hence, families need to be intact for adolescents to experience the warmth and nurture of loving family. Significant relationship between broken homes and adolescent behavioural problems as well as peer pressure has been indicated (Ajidahun, 2011). In spite of the wide spread awareness on the detrimental effects of psychosocial problems on public health particularly among adolescents in the developed countries, little has been done in this part of the world where the detrimental consequences are more prevalent. Most African countries do not maintain vital statistics and comprehensive data on mental health due to inadequate consideration and resources.

In Nigeria, definite structure and research arrangements that could aid gathering of information on mental disorders in the population are practically unavailable. Also, in all regions (or states) in Nigeria, community members culturally held negative perceptions about mental disorders that result in stigma and feeling of shame for families and the mentally ill persons. Consequently,

information about mental disorders is culturally considered too intimate to share with people outside of the nuclear family without attracting stigma and social exclusions. In some communities, the culture is that incidence of mental disorders in any family is associated with the wicked acts of such family. This makes many families to conceal illnesses in order to avoid community gossip and rejection thereby hindering appropriate help-seeking behaviour of many families (Jack-Ide and Uys, 2013). These make evaluation of the extent of the problems as well as further investigations into the inherent complexities a difficult venture. Therefore, local reports on mental health issues can make a valuable contribution to the needed information in this area. Local studies such as this can also provide remote strategies to identify the risk factors, increase awareness, remove stigma and improve access to mental health care services especially among the populations that are disproportionately affected (WHO, 2001, USDHHS, 1999).

Apart from that, the determinants and the prevalence of psychosocial outcomes vary from one community to another and in Ikere Local Government (LGA), recent local information have shown that young people, particularly those in schools (and from broken homes) tend to be involved in anti-social activities ranging from gangsterism to substance abuse (Olusola et al, 2012). These are clear evidences of psychosocial dysfunctions among people of this group. Hence, examining the predictors and the prevalence of psychosocial functions among adolescents in Ikere LGA could serve as a pointer and provide aids for easy counseling, prevention and rehabilitation policies both locally and in the state at large.

1.4 AIM AND SPECIFIC OBJECTIVES OF THE STUDY

Main aim: To study factors affecting psychosocial functions among adolescents in schools in Ikere Ekiti.

Specific objectives:

- To estimate the prevalence of psychosocial problems among adolescents in Ikere local government area
- To examine the effect of socio-demographic factors on psychosocial functioning among adolescents in schools
- To determine the effect of self-esteem and positive affect on peer problems among adolescents in schools
- To determine the effect of emotional symptoms on conduct problems among adolescents in schools
- To evaluate effect of selected individual-level characteristics and contextual factors on psychosocial functioning among adolescents in schools

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

Mental health is the psychological state of human well being that is characterized by personal development, self-acceptance and positive relationship with others otherwise; it is called mental illness or disorder which among adolescents in school could be as a result of many factors like depression, low self-esteem, family problem, bullying etc. Public mental health focuses on wider prevention of mental illness and promotion of mental health across the life course (Detels, 2012). Among the notable organizations that have made tremendous contribution to this facet of mental health are BELLA study group in Germany and Royal College of Psychiatrists in London. The latter believes that mental health is a central public health issue and that it should be a priority across all government departments (RCP, 2010). This position statement sets out the necessary contribution that public mental health makes to a wide range of health and social outcomes for individuals and society (RCP, 2010).

As a result of increase awareness about the importance of public mental health and psychosocial functioning in groups and communities, many instruments have been developed for measuring important aspects of mental health especially among children and adolescents. Some of these researchers prefer combination of scales in measuring mental health constructs. Among such scales are Rosenberg self-esteem scale (Rosenberg, 1965), epidemiology studies depression scale for children (Weissman et al., 1980), while strength and difficulty questionnaire, developed by the commonwealth of Australia in 2005 has also been used alone or for further screening of general mental problem symptoms and the burden of the disease (Bettge et al, 2008).

2.2 THE DYNAMICS AND CHARACTERISTICS OF ADOLESCENCE

The peculiarity of adolescence age (10-19years) is very unique in human developmental stage. Being a transitional phase from childhood to adulthood, it has been asserted that adolescence is a period of emotional stress, resulting from the rapid and extensive physiological changes occurring at pubescence (Flisher, 1999). Also, emotional stress among adolescents has been reported not to be inevitable, but culturally determined; it was found that difficulties in the transition from childhood to adulthood varied from one culture to another (Emler, 2001). Erikson (1968) saw development as a psychosocial process going on throughout life.

All the three insights are valuable in their own way, but each adolescent shares a unique feature: to develop from a dependent to an independent person who relates to others in a humane and well-socialized fashion (Egede, 2009). Also, Ajidahun (2011) reported that there is a significant relationship between peer pressure and adolescents' behavioural problems and later suggested that it requires an atmosphere of love and understanding from parents for proper conduct of their children.

Another very important characteristic of adolescent age is the fact that most times, wrong steps are easily taken at this stage which may lead to lack of concentration. Specifically, they could become sexually active (As was estimated by the United Nation on Reproductive Health (2000) that Nigerian girls are sexually active at the early age of thirteen years) or become addicted to drugs (which may eventually lead to having lower self-esteem). In addition, self-perception can arouse depressive symptoms or suicide ideation which has long been associated with several psychosocial indicators among adolescents (Michael et al, 2012).

2.3 DEMOGRAPHIC FACTORS

The commonest factor ~~under~~ consideration in literature is gender. Most studies revealed that females are more likely to suffer psychosocial disorders than their male counterparts (Ahangar et al, 2012). Studies have found that in general, female adolescents experience more negative affective states compared to male adolescents (Ahangar et al, 2012; Demir and Urberg, 2004). It was perceived that female adolescents tend to have higher social stress, lower self-esteem, and higher internalizing symptoms than male adolescents (Ahangar et al, 2012; Massip et al, 2010; S. Beettge et al, 2008; Tamas keller, 2010; Yaacob et al, 2009). These findings tend to indicate that females are more vulnerable to emotional or psychological problems than males during adolescence. Nevertheless, reports from a study conducted among adolescents across schools in Barcelona (Spain Capital) showed that the gender effect could be inconsistent in all age groups (Massip et.al, 2010). In the study, Children's Depression Inventory (CDI) was used to examine prevalence of depression between two age groups (8-12 years old and 13-18 years old). The results were found to be significantly different across gender in the older group but almost similar in the younger group.

Furthermore, children from single-parent have been found to have their emotional developments affected as they develop similar features with the parents that brought them up (Ajidahun, 2011; Beck, 1999). Single parenting also influences on children's intellectual capacity. Hence, in the situations where unavoidable single parenting exists, parents should enhance healthy emotional tactics (Falana, 2012). Article from Child Trend and National Adolescent Health Information Center itemized the influences parental relationship has on children's behaviours. Many of the parents most especially those that are not living together did not know their children whereabouts after school. About 25% of the parents were not too close to their children while some adolescents

reported difficulties discussing with their parents things that bother them (Ajidahun, 2011). Among the bothering factors is parents' level of education. 80% of adolescents whose parents have higher education exhibit less antisocial behaviours (NAHIC, 2006).

2.4 CLINICAL AND PSYCHOSOCIAL VARIABLES:

2.4.1 Depression:

This is a mental illness in which a person has feelings of sadness, instability, loneliness, hopelessness, worthlessness, and guilt (Ahangar et al, 2012). Depression is a common mental disorder and can be successfully treated (K Sorsdahl, DJ Stein, C Lund, 2012; K. A. Asmussen, 2005). Older children and adolescents with depression may be silent, refuse to participate in family and social activities, get into trouble at school, use alcohol or other drugs, or stop paying attention to their appearance. They may also become negative, restless, grouchy, aggressive, or feel that no one understands them. These symptoms of depression are commonly grouped into four. Namely: somatic and retarded activity, depressive affect, interpersonal problem and positive affect (Bettge et al, 2008). All these are considered as internalizing symptoms since sufferers with major depression are likely to identify themselves as depressed before their parents/teachers begin to suspect that they are having the problem (CMHS, 1998). Although causes of depression in child may be due to genetic or psychosocial factors, there are a variety of reliable treatments for depression, including medication and counseling (Ajidahun, 2011; Massip, 2010; Probst et al, 2006).

Apart from gender difference that was mostly considered in literatures, research also showed that chronic illnesses can make adolescents to be vulnerable to psychosocial problem (Tamas Keller 2010). For example, previous study showed that the rate of depressiveness is double in those with diabetes, hypertension, coronary artery disease and heart failure, and triple in end-stage renal failure, chronic obstructive pulmonary disease and cerebrovascular disease while the prevalence of depression among those with two or more chronic physical conditions is almost 7 times higher compared with healthy controls (Egede, 2007).

Physical illness can have profound social and emotional consequences and can result in mental health problems which impede recovery from the physical illness and increase mortality rates. Furthermore, Bettge et al (2008) among other researchers revealed that self-esteem has a negative correlation with depression. Also, unwanted pregnancy among adolescents in school has been identified as a risk factor simply because they are at greater risk of experiencing psychosocial problems (mostly depression), birth complication, toxemia, anemia and even death (Egbochukwu and Ekanem, 2008; Odu and Ayodele, 2007). Thinking about future financial and employment problems, negative self-esteem, abusive homes, poor academic performance are also found to contribute to depressive symptoms among adolescents (Odu and Ayodele, 2007).

2.4.2 Strength and difficulty:

Emotional and behavioral problems are among the most prevalent chronic health conditions of childhood and often have serious negative consequences for a child's academic achievement and social development (Patricia et al, 2012). As part of the recent development in this area of psychosocial outcomes, the Strengths and Difficulties Questionnaire (SDQ) has been used to

screen for behavioural, conduct, hyperactivity, peer and emotional problems in children (Astrid and Deboutte, 2009; Bakare et al, 2010; Bernstein et al, 2012).

One of the most critical factors affecting adolescents in schools is conduct disorder (Bakare et al, 2010; Bernstein et al, 2012; Raven-Sieberer et al, 2009). Children and adolescents with these disorders have great difficulties following rules and behaving in a socially acceptable ways. They are often viewed by other children, adults and social agencies as "bad" or delinquent, rather than mentally ill. Factors that may contribute to a child developing conduct disorder include brain damage, child abuse, genetic vulnerability, school failure, and traumatic life experiences (FFF 2012). Previous studies have shown that this problem is more prevalent among boys than girls (Bakare et al, 2010; Barnow et al, 2005; Colman et al, 2009; Detels, 2012). Colman and his colleagues reported that adolescent with depression may also exhibit conduct problem (Colman et al, 2009).

Behavioural difficulty symptom where sufferers are characterized by preferring to stay alone, conscious of being picked or bullied by other children and dissociating self from colleagues of same age group (peer relationship problems) (Goodman, 2005) also plays an important roles in an adolescent's development from child to adult. During adolescence, peering becomes increasingly important for emotional well-being, while the parents' role decreases. In the company of peers, adolescents start to separate from their parents and start spending more time with friends. However, Peer relationships have been suggested to be important for psychological health and adjustment in adolescence (Rice and Dolgin, 2002). Gender difference in peer problems varies and has been reported by selected authors in previous studies. For instance, among intellectually disabled children, mean score on peer problem was significantly higher for male than female children (Bakare et al, 2010). Also, Demir and Urberg(2004) observed peer

conflict to be positively correlated with depressive mood while adolescents who see themselves as unintelligent, unpopular and unattractive are more likely to succumb to peer's pressure because their hunger for acceptance and approval.

Pro-social behaviours are those which help or benefit another person; examples of these include helping, sharing, or comforting others (Werner-Bierhoff, 2002). In most studies, this symptom has been found to be protective for psychosocial problems.

2.4.3 Self-esteem

Self-esteem was logically defined as success divided by pretensions (james, 1890). That is, self-esteem increases by achieving greater successes and avoiding failure and vice versa. This was a bit different from the perception that self-esteem is more closely linked with personal quality aspirations and self view about how people think or feel about themselves (Rosenberg, 1979). Thus, Rosenberg found that not all adolescent cared equally about being likeable and he introduced a commonly used 10 items-scale for measuring self-esteem that was adopted in this research work. Low self-esteem in adolescent is likely to result when key figures reject, ignore, demean, or devalue him/her. Subsequent thinking by Coopersmith (1967) and Rosenberg (1965, 1979), as well as most contemporary self-esteem researchers, are in tune with the basic tenets of symbolic interactionism. According to this perspective, it is important to assess how people perceive themselves to be viewed by significant others, such as friends, classmates, family members, teachers etc. During adolescence, biological orientation predicted heightened self-esteem for males but not for females, whereas a communal orientation gave a contrast report (Heatherton and Wyland, 2003). In another study conducted among young Americans, self-esteem was also reported to be higher for male than female (Kristen et al, 1999). Human sciences have encouraged

the motive that self-esteem is good for individuals who have it as well as societies. However, since it is good for collective well-being and seen as a social vaccine, through instructive reasoning, it was advised that it worth spending public money to ensure there is more of it to go around (JRF, 2001).

2.5 Multilevel modelling

Statistical methods such as classical linear regression, logistic regression and many others assume observations are independent (Rabe-Hesketh and Skrondal, 2012; Gelman and Hill, 2007) and when such is used for nested data structure, the result may differ from the actual value which might give rise to a too small standard error. Hence, confidence interval that are too narrow and p-value that are too small. Thus, insignificant observation may be interpreted as being significant (Betty et al, 2003). In multilevel modelling, we use random variables to model the variation between groups. An alternative to this is to use ordinary regression model but to include a set of dummy variables to represent the differences between the groups. The multilevel approach offers some advantages like:

- It has the advantage of taking the hierarchical structure of data into account by specifying the random effect at each level of analysis. Therefore, inferences made on the fixed effects are more conservative (Yusuf et al, 2011).
- We can generalize to a wider population. That is, something can be said about the variation within a sub-group
- Fewer parameters are needed

- Information can be shared between groups by assuming that the random effects come from a common distribution. This can improve the precision of predictions for groups that have relatively little data.

2.5.1 Features of multilevel Models

The multilevel models have unique features that differentiate them from other modelling strategies in statistics. For instance, the Individual Level Variables (ILV) are variables that are specific to individual or characterized individual level construct while Area/group Level Variables are variables that are used to characterize groups. Group level variables can be derived i.e. aggregate of individual level variable or integral (global variable).

Furthermore, the total variance in individual level outcomes within (as a result of the variations in individual determinants) and between (variations in clusters' characteristics) is termed variance component while the ratio of between clusters variances to the total variation can be regarded as intra-class correlation (ICC).

Fixed effect corresponds either to parameters that do not vary (for example, fitting the same regression line for each of the schools) or to parameters that vary but are not modeled themselves while the regression coefficients that are being modeled are considered random effect in the sense that they are considered outcomes of a process identified with the model that is predicting them.

2.5.2 Multilevel modelling in SPSS

Multilevel modelling in SPSS can be done by syntax method or through mixed model menu that can be used to estimate the number of different types of models with random intercept (i.e. means that vary across clusters) and random slope (i.e. within-group regression coefficients that vary across groups) (JeremyJ.Albright and Dani M. Marinova, 2010). It is also useful in

assessing variations between and within change at individuals and groups over repeated measurements or observations.

There are three distinct steps in developing the multilevel model. The first step is to develop an empty model with no predictor to partition the variance in the outcome into within and between group components. The null model provides a measure of dependence within each level of unit by the way of the ICC. An important measure that describes these dependences in the data is cal ;led the intra-class correlation coefficient (ICC) i.e. the statistics that measures the extent to which individuals in different within the same group are more similar to each other than they are to individuals in different groups. For multilevel linear regression, the ICC is calculated as

$$\rho = \frac{\sigma^2}{\sigma^2+\mu^2}$$

Where σ^2 represent the individual level variance and μ^2 represent the contextual variance. Also, ICC is the proportion of between group variance to the total variance. The higher the value of ICC, the more justified the suitability of multilevel model (Gelman and Hill, 2007; Hox, 1995; Rabe-Hesketh and Skrondal, 2005). Actually, it has been suggested that the use of multilevel model should not be halted if the value of the ICC is 0.05 or more (Kristen Ringdal, 2012). Also, if the ICC equals 0, then the groupings by entities is of no use (you can fit simple regression as well) but if it approaches 1 then there is no variance to explain at the individual level, everybody is the same (Torres-Reyna, 2010). In linear model, the ICC is based on the clear distinction that exists between the individual level variance and the area level variance (Merlo et al, 2006).

2.5.3 Multilevel modelling in Public Health Research

Logistic and linear multilevel models are commonly used in public health research to examine the independent and interacting effects of area level predictors on health outcomes. Especially, outcomes that deal with students or heterogeneous groups perceived to have individuals that are

more correlated within the sub-groups than across groups. The relevance of multilevel modelling technique as a statistical tool in public health cannot be over emphasized. Examples on the area involving cluster variations are: growth patterns of students; Outcomes of survival on an intervention studies, longitudinal observation of an experimental studies and mental health. In a study conducted to assess the effect of neighbourhood and individual wealth status on sexual behaviour among women (where logistic multilevel analysis was used), individual and community wealth status are independent predictors of women's sexual behaviour and there was a significant neighbourhood variation that could have been abandoned if the convectional binary regression was to be used (Uthman et al, 2008). The effect of hierarchical structure data was also demonstrated by Yusuf et al (2011) when the convectional logistic regression analysis was compared with multilevel logistic regression using data on violent behaviour among secondary school students in Ibadan, Nigeria. In the study, random effect logistic regression gives a better estimate than the conventional logistic regression (Yusuf et al, 2011). In using multilevel statistical procedures to investigate the variation in contraceptive use among uneducated women across India, socioeconomic variables significantly contributed to the variations observed among the illiterate women. There are also considerable diffusion effects in progress, many of which operate at levels beyond the uneducated women's own individual circumstances (Mc Nay et al, 2003). In conclusion, multilevel analysis has emerged to be a useful analytical technique in public health because it has been able to explain how group and individual level variable interact in issues of health and diseases. Nevertheless, the use of multilevel linear regression is not common in literature.

CHAPTER THREE

METHODOLOGY

3.1 STUDY AREA

Ikere is one of the sixteen Local Governments Areas (LGAs) in Ekiti-State, Nigeria. Ikere has about 150,000 inhabitants distributed in homogeneous communities in southern Ekiti state. Indigenes of Ikere are characterized by high level of cultural heritage and Academic excellence. The LGA has fifteen (15) secondary schools (both public and private) at different locations across 11 Political Wards of which thirteen (13) are mixed schools and two single schools (boys-only and girls-only). The research was carried out in the following schools: African Church Comprehensive High School (ACCHS, mixed school); St Louis Grammar School (girls only); Amoye Grammar School (mixed school); Ekiti Government college (EGC, mixed school); Ajolagun High School (AHS, mixed school), Victory College (private, mixed school)

3.2 STUDY DESIGN & SAMPLING TECHNIQUE

This study is a comparative cross sectional study. Primary data was collected via a self-administered questionnaire. In addition to demographic information the questionnaires consist of three standardized self-reported instruments. Namely: Rosenberg self-esteem scale; Strength and Difficulty Questionnaire (SDQ); Center for Epidemiological studies Depression scale for Children (CES-DC).

The questionnaires were administered to a total of 500 students in all. Six political wards were purposively selected from the available 11 wards based on size of the schools and location. Where there exists only one secondary school in a selected ward; the secondary school is automatically

selected for the study. In each selected school, registered students who gave informed consent were recruited to participate in the study.

3.3 INCLUSION AND EXCLUSION CRITERIA

Participants in this study included students (between the ages 10 and 19 years) in secondary schools within Ikere L.G.A. Student outside the given age range attending secondary schools within Ikere LGA and students within the given age range (who (though living in Ikere LGA) are attending schools outside the LGA were excluded from the study.

3.4 ETHICAL CONSIDERATION

3.4.1 Ethical approval:

Ethical approval for this study was obtained from the Ethic and Research Committee, Ekiti State University Teaching Hospital (UTH), Ado-Ekiti, Nigeria with the protocol number: EKSUTH/A67/2013/07/01. In each selected school, permission was obtained from the principals of the schools who also stood provided parental consents for participants without parental consents.

3.4.2 Confidentiality of data:

To maintain confidentiality, the students' names and registration numbers were not requested and the data was carefully and independently collected without allowing interference of co-participants. School level comparison was made by coding the schools numerically without mentioning names.

3.4.3 Beneficence to participants

Many of the students might not have seen or filled standardized instrument before. Hence, this would serve as an opportunity for them on how to think logically and attempt technical questions such as used in the study. Also, the results of the study would be communicated to school counsellors in the selected schools for counselling and other rehabilitation measure(s). It will also serve as a pointer to policy making concerning adolescents in school setting.

3.4.4 Non-maleficence to participants:

This study did not pose any harm because it did not involve collection of biological sample like blood, urine etc. Apart from that, effort was made to ensure that questionnaire administrations do not interfere with normal academic activities of the students

3.4.5 Voluntariness:

Before administering the questionnaire, participants were handed the informed consent forms which they appended after a briefing. Additionally, it was passed across that participation is voluntary and that they are at liberty to withdraw without any sort of victimization.

3.5 DATA COLLECTION AND SAMPLE SIZE ESTIMATION

The outcome variables under consideration in the study are continuous and the estimates were to be compared with reports from similar studies. This was done to avoid loss of information that could arise from data grouping. We calculate sample size thus:

$$n = \frac{(Z_{\alpha} + Z_{1-\beta})^2 p(1-p)}{d^2}$$ (Cochran, 1989)

The $Z\alpha$ and $Z_{1-\beta}$ are the standardized normal deviates with the probabilities α and $1-\beta$ respectively at 95% significant level and power component $(1-\beta)$ of 80%. Also, d = precision and P = prevalence of mental disorders in sub-Saharan Africa = 14.3% (Melissa et al, 2012).

$$n = \frac{(1.96 + 0.84)^2 0.143(0.857)}{0.05^2}$$

$$n = 384.3$$

Therefore, with $p = 0.143, q = 0.857, Z_{\alpha} = 1.96, Z_{1-\beta} = 0.84, d = 0.05$:

Adjusting for a 10% non-response rate, the minimum sample size becomes $N = \frac{n}{1-r} =$

$$\frac{384.3}{1-0.1} \approx 427$$

3.6 INSTRUMENTS

The instrument used for this study comprises four segments. The first part contains socio-demographic variables while the remaining parts have three scales with the following features. The first part contains ten items on general feeling about ones-self (self-esteem) with response options ranging from strongly agree, agree, disagree and strongly disagree. The second part contains 25 items Strength and Difficulty Questionnaire for evaluating adolescent emotional symptom, conduct problem, hyperactivity, peer problem and Pro-social behavioural traits with response options as 'Not true, somewhat true and certainly true'. Lastly, the third part contains 20 items for studying depression in children with 4 sub-scales namely: somatic symptoms and retarded activity, depressed affect, positive affect and interpersonal problems. The response options are: Not at all; A little; Some; A lot.

3.6.1 Pilot study

A school at the boundary of the L.G.A but with similar characteristics with others within the populated area was used as a preliminary study center. A total of 103 students (61 boys and 42 girls) were captured by consenting to participate after acknowledging full understanding about the study.

3.6.2 Validity and reliability of the instruments

The reliability of the included standardized scales was assessed using the Cronbach's alpha. A scale is said to have good reliability estimate if the Cronbach alpha is ≥ 0.5. Reliability was estimated for the CES-DC and SDQ in both the pretest and the main study.

3.7 DATA MANAGEMENT PLANS

Completed data was captured on a spreadsheet using the Word Excel in preparation for analysis. The data were recorded from question responses into meaningful prevalence variables. Double data entering was done to ensure data quality. Thereafter it was transferred into the IBM SPSS version 20 and screened for data entry errors, missing data and outliers.

3.7.1 Rosenberg self esteem scoring

The Rosenberg self-esteem scale was scored and analyzed as follows: SA=3, A=2, D=1, SD=0. Items with asterisk were reverse scored, that is, SA=0, A=1, D=2, SD=3. Hence, self-esteem was computed as the total scores for the 10 items. Due to missing value that could truncate the actual values of the total scores, the weighted value was used by multiplying the mean of all items per respondent by 10. However, the higher the score value, the better the self-esteem and the values range from 0 to 30. This was computed for each respondent.

3.7.2 Strength and Difficulty Questionnaire (SDQ)

The total difficulty score was computed as the sum of all the subscales except pro-social behaviour. The value ranges from 0-40. More also, the clinical burden of the symptoms were categorized. A mean score of 0-15, 16-19, 20-40 in behavioural total difficulty signify normal, moderate and abnormal grades respectively. Similarly, Emotional symptoms score (0-5, 6, 7-10); Conduct problem score (0-3, 4, 5-10); Hyperactivity score (0-5, 6.7-10); Peer problem score (0-3, 4-5, 6-10); pro-social behaviour score (6-10, 5 0-4) were analyzed. Meanwhile, the strength and difficulty scale was calculated based on its 5 sub-divisions with not true=0, somewhat true=1 and certainly true=2. See Appendix IV for more details.

3.7.3 The Center for Epidemiological Studies Depression Scale for Children (CES-DC)

The Center for Epidemiological Studies Depression Scale for Children (CES-DC) is a 20-item self-report depression inventory with possible scores ranging from 0 to 60 in 4 sub-scales namely; somatic symptoms and retarded activity (items:1,2,5,7,11,13,20), depressed affect (items:3, 6, 9, 10,14, 17, 18), positive affect (items:4,8,12,16) and interpersonal problems (items:15, 19) (please see appendix III for more details). Each response to an item was scored as follows:

0 = "Not At All"; 1 = "A Little"; 2 = "Some"; 3 = "A Lot"

However, items 4, 8, 12, and 16 are phrased positively, and thus were scored in the opposite order:

i.e. 3 = "Not At All"; 2 = "A Little"; 1 = "Some"; 0 = "A Lot"

Higher CES-DC score indicates high risk level of depression. Weissman et al. (1980), the developers of the CES-DC, have used the cutoff score of 15 as being suggestive of depressive symptoms in children and adolescents. In this study, the scores were categorized into two groups

(non depressed and depressed) based on cut off of 22 as used in a similar study (Trangkasombat, 2012). In order not to overestimate the prevalence of depression among the group, the SDQ score was used as a further criterion for depression screening.

3.8 STATISTICAL MODELS AND DATA ANALYSIS

Independent t-test was used to compare the differences in psychosocial outcomes (depression score, conduct problem score, peer problem score) across the participants' demographic variables (i.e. gender, location, having friend of opposite sex, family type and school type). Similarly, ANOVA was carried out for variables (i.e. family status, parents' highest education, parents' occupation) that have more than two options. However, a bivariate correlation analysis was conducted for all the perceived covariates in order to assess their relationship. Every significant baseline variable was used as predictors together with the correlates like self-esteem, positive affect and emotional symptoms scores to explain and predict psychosocial disorders among adolescents in schools in Ikere LGA. Multilevel linear modeling was adopted as a result of the nested structure of the data.

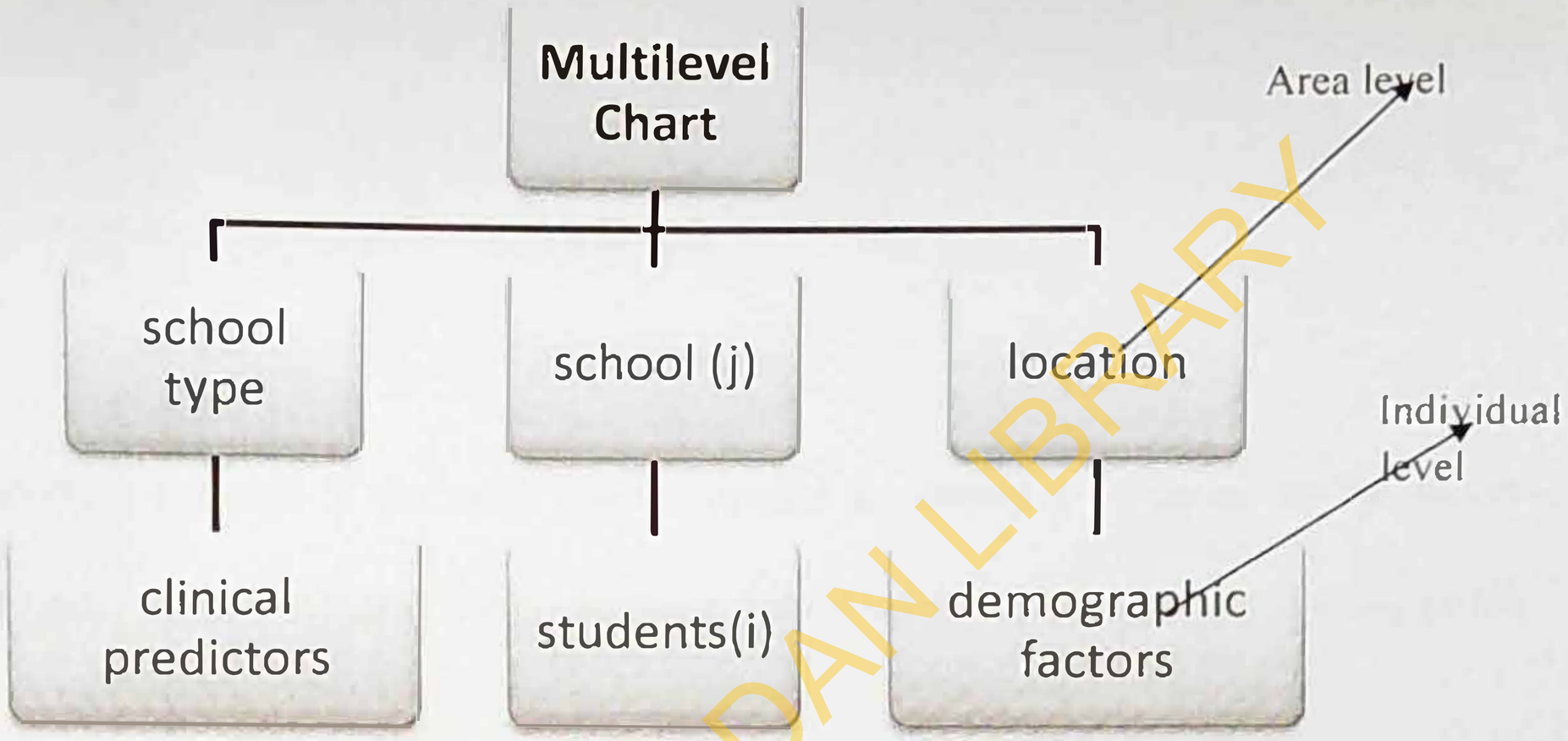

Figure 3.1

i= 1, 2...m; j = 1, 2...n

3.9 APPLICATION OF MULTILEVEL LINEAR REGRESSION MODEL IN THIS STUDY

The multi-level analysis was done in three steps to regress depression, peer problem and conduct problem

Step 1

Empty model: no explanatory variable was included.

$$Y_{ij} = b_{oj} + e_{ij}$$

That is, the outcome variable Y for individual i nested in school j is equal to the mean outcome in unit j plus an individual error e_{ij} because there may be effect that is common to all students within the same school

Step 2

In model two, only individual level factors (self-esteem, family type, family status etc) were included to investigate to what extent these factors influence psychosocial functions among adolescents in schools in Ikere L.G.A.

$$Y = X\beta + Z\mu + \in$$

For model 2, Z = { } (i.e. an empty cell)

Here, Y is an nx1 vector of responses. X is an n x p matrix containing the effect regressors. β is a px1 vector of fixed effect parameters. Z is an nxq matrix of random effect regressors. μ is a qx1 vector of random effects and $\in$ is an nx1 vector of errors or residuals.

Step 3

In model three, both individual and school level (as illustrated in figure 1 above) predictors were included.

$Y = X\beta + Z\mu + \in$; Where Z is an nxq matrix of random effect regressors (school type and location).

3.9.1 Intra-class correlation coefficient (ICC) estimation

The ICC describes the level of dependency in the data i.e. the statistics that measures the extent to which individuals within the same group are more similar or correlated to one another other than they are to individuals in different groups. For multilevel linear regression, ICC is calculated as $\rho = \frac{\sigma^2}{\sigma^2 + \mu^2}$

Where σ^2 represent the individual level variance and μ^2 represent the contextual variance. Also, ICC is the proportion of between group variance to the total variance.

3.10 DEFINITION VARIABLES

The main dependent variables for this study are depression, conduct problem and peer problem among adolescents in schools in Ikere LGA. The regressions were carried out in three stages.

3.10.1 Outcome variable I (Depression):

Depression is a mental illness in which the sufferer has a feeling of sadness, worthlessness or guilt. This was quantified by interviewing the students about their past six months experience by

using CES-DC. The raw scores derived from CES-DC were used as continuous data ranging from 0-60.

The independent variables for depression used in this study were: sex, family type, family status, father's highest education, father's occupation, mother's highest education, mother's occupation, having friend of opposite sex, age, self-esteem, emotional symptoms, conduct problem, peer problem, pro-social problem, location, and school type. These variables were grouped into:

- Individual level variable and
- School level variable.

(a) Individual level variables

The variables under this category are sex, family type, family status, father's highest education, father's occupation, mother's highest education, mother's occupation, having friend of opposite sex, age, self-esteem, emotional symptoms, conduct problem, peer problem, pro-social problem.

Sex was grouped into male or female

Family type was grouped into monogamy or polygamy

Family status was grouped into 4 groups: parents are living together, parents are divorced, parents are separated and single mother

Parents' highest level education: this was re-coded to: no formal education, pry/sec education and postsecondary education.

Parents' occupation was regrouped into farming/trading, civil servant and employee of private company.

Having friend of opposite sex was also grouped into two i.e. yes or no

Covariates: Age, self-esteem, emotional symptoms, conduct problem, peer problem, pro-social problem were used as continuous variables without being categorized.

(b) School level variables

These are the predictors that can have a contextual effect on the higher level factor (school)

Location was grouped into rural or urban

Type of school was also categorized into private or public school.

Stage II

3.10.2 Outcome variable II (Peer problem):

Peer problem is a sub-scale of SDQ and was used as a continuous variable by quantifying peer disorder 5-items symptoms. The raw scores derived from peer problem scale were used as continuous data ranging from 0-10.

(a)Individual level variables

We have sex, family type, family status, parents' highest education, parents' occupation, having friend of opposite sex, age, self-esteem, positive affect.

Positive affect is a 4 item sub-scale of depression that evaluates individual pleasant feelings. It was quantified and used as a quantitative variable ranging from 0-12. Other variables were used as defined in segment I above.

(b) School level variables: Location and school type

3.10.3 Outcome variable III (Conduct problem):

Conduct problem is a 5 item subscale of SDQ that measures adolescents' disorders in following rules and regulations. It was quantified and used as a continuous variable ranging from 0-10.

(a) Individual level variables

Individual level predictors are sex, family type, family status, parents' highest level of education, parents' occupation, having friend of opposite sex, age, self esteem, emotional symptoms.

Emotional symptom is also a 5 items subscale of SDQ to evaluate the adolescents internalizing problem. It ranges from 0 to 10. All other variables maintain previous definitions.

(b) School level factors: Location and school type.

CHAPTER FOUR

RESULTS

This chapter is organized into four sections. Section one summarizes reliability of the instrument as well as the frequency distributions for the demographic variables. In section two, the prevalence of psychosocial functioning across the baseline and demographic factors were summarized. Under this section, the descriptive statistics for SDQ and CES-DC sub-scales were displayed in tables and charts. Also, significant mean-score differences were reported as mean score, standard deviation and p-value at 95% confidence (mean, SD, p-value). Section three summarizes correlation among various covariates. Bivariate correlation coefficients (r) and p-value at 95% confidence were reported for those with significant relationship. Lastly, section four was further classified into three parts based on the outcome variables. Each part reported the multilevel model results. Similarly, each model comprises two tables: one for the fixed effects and the other for random effects. Average scores were reported for the fixed effects in the best fitting model (Model with the least AIC value) while the second table display the contextual variables scores and the random effects.

4.1 RELIABILITY ANALYSIS

Reliabilities of the two instruments used were calculated for both pilot and the main study. Cronbach's alpha statistics for the 25 item strength and difficulty questionnaire (SDQ) and 20 item depression scale (CES-DC) were 0.604 and 0.757 respectively while the full dataset for the main study gave 0.601 and 0.772. These results are relatively close which imply high consistency.

4.2 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

The sample consisted of 480 observations of which 40.9% of the respondents were males while 59.1% were females. Participants ages ranged from 11 to 19 years with a mean age of (15.22±1.38) years. Respondents were fairly evenly distributed across the selected schools (ACCHS-14%, Victory-21.7%, St Louis-16.7%, EGC-17.5%, Amoye-15% and AHS-15.2%). Female participants were younger (15.00±3.25 years) than their male counterpart (15.56±3.47 years). Majority of the participants were Christians (96.2%) while 3.8% of them are Muslims. The proportion of the students residing in urban areas (57.1%) is a bit higher than those from the rural areas (42.9%). However, more than two-third of the respondents came from monogamous families (77.5%) and in majority of the homes, parents are living together (84.5%) while just a few (16.2%) are from families whose parents are not living together. The number of students whose fathers have a formal education (75%) is three times larger than those whose father has no formal education (25%). Meanwhile their mothers share similar feature in terms of education with 76.9% having a formal education (ranging from primary to tertiary education) compared to 23.1% without any formal education. In respect to ethnic composition, the sample comprised 93.3% of Yoruba, 5.6% Igbos, 0.6% Hausas and 0.4% (such as Igala, Urhobo etc) from other tribes.

Table 4.1: Frequency distribution of the respondents by their demographic data

variables	Frequency	Percentage
Sex		
Male	195	40.9
Female	282	59.1
Religion		
Christianity	461	96.2
Islam	18	3.8
Area of residence		
Rural	179	42.1
Urban	246	57.9
Ethnicity		
Yoruba	447	93.3
Others	30	6.7
Family type		
Monogamy	354	77.5
polygamy	103	22.5
Family status		
Parents are together	402	84.5
Parents are divorced	10	2.1
Parents are separated	32	6.7
Single mother	32	6.7
Father's education		
No formal education	111	25
Pry/sec education	120	27
Tertiary education	213	48
Father's occupation		
Farming/Trading	127	30.8
Civil servant	184	44.6
Employee of private org	102	24.7
Mother's highest education		
No formal education	104	23.1
Pry/sec education	131	29.1
Post sec education	215	47.8
Mother's occupation		
Farming/trading	224	51.1
Civil servant	173	39.5
Private company employee	41	9.4

4.3 PREVALENCE OF DEPRESSION AMONG ADOLESCENTS IN SCHOOLS IN IKERE EKITI

The Table 4.2 below shows the prevalence of depression among the participants. The CES-DC observed scores were grouped into depressed and non depressed groups based on a cut-off of 22 (Trangkasombat and Rujiradarporn, 2012). Depression was more prevalent among boys than girls as 29.2% of the boys scored above the cut-off point compared to 23.8% of the girls. In the present study, more than a quarter (26%) of the study population were depressed. In order to get a more conservative result (Bettge et al, 2008) a cut-off SDQ>15 (Goodman, 2005) was used as a further criterion which consequently reduced the prevalence depressed group in the total population to 17.5% while the initial proportions were reduced to 20.7% and 15.5% for boys and girl respectively.

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Table 4.2: Prevalence of depression across gender of the participants

Gender	Non Depressed group	Depressed group	Depressed group with SDQ score>15
Male	70.8%	29.2%	20.7%
female	76.2%	23.8%	15.5%
TOTAL	74%	26%	17.5%

4.4 DEPRESSIVE SYMPTOMS MEANS SCORES BY GENDER

In Figure4.1 below, the depressive symptoms are aggregated to symptom complexes according to the sub-scale of the CES-DC. The figure shows the mean scores of the respondents for the symptom complexes as displayed. In all, male participants' mean scores are: 7.41±3.98 in 0 to 21(somatic symptoms), 5.58±4.25 in 0 to 21 (negative affect) and 1.56±1.35 in 0 to 6 (interpersonal problem) respectively while their female counterparts similarly scored 6.8±4.10 (somatic symptoms), 5.01±4.35 (negative affect) and 1.31±1.21. That is, boys had higher scores across symptom complexes except for positive affects where male counterpart had 9.17±3.43 compared with 10.03±2.72 in the female category. This might have served as protective for other symptoms intuitively.

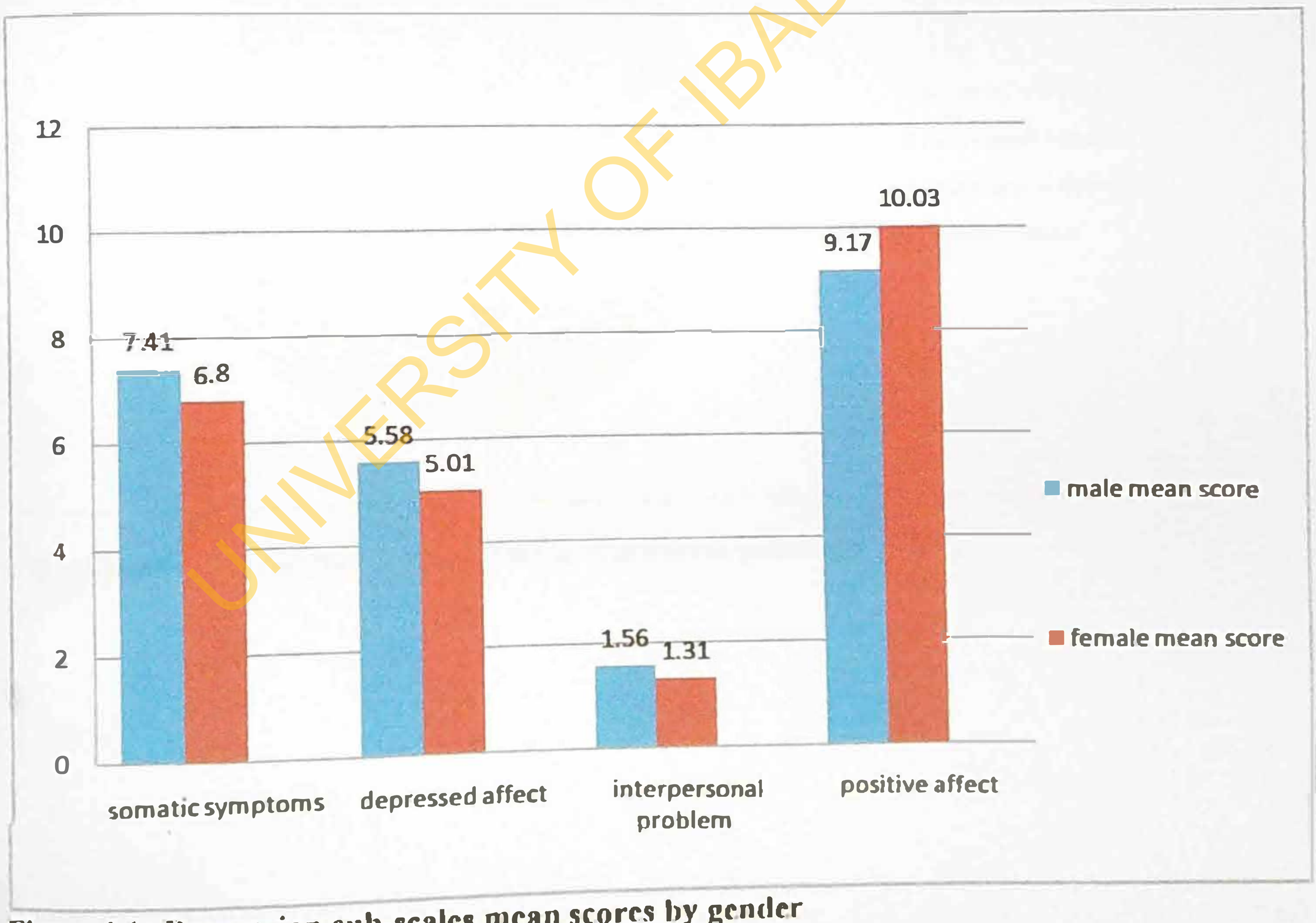

Figure4.1: Depression sub-scales mean scores by gender

4.5 ATTRITION RATE FOR DEPRESSIVE SYMPTOMS QUESTIONS

In Figure 4.2, attrition rate for answering questions on depression symptoms is displayed (Bettge et al, 2008). Non response rate was highest for the depressive affect scale (12.1%) but the least was observed for positive affect (0.8%). Among the items that recorded low responses were "I felt kids were not friendly with me" "felt things did not work right" etc. while "felt am not hungry" "felt people did not like me" "I felt scared" attracted more responses.

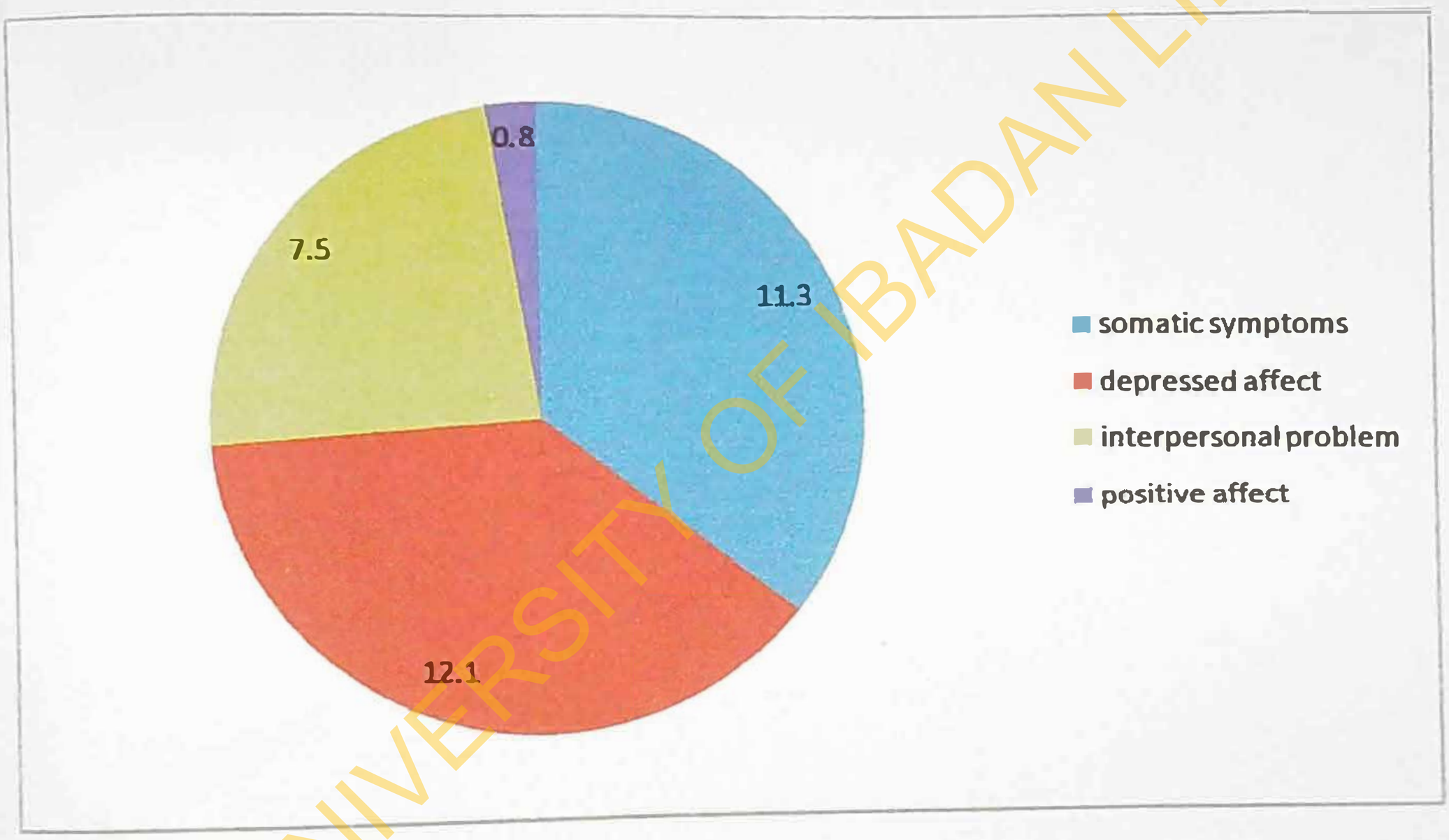

Figure 4.2: Attrition rate for depression symptoms questions

4.6 GENDER AND BEHAVIOURAL PROBLEMS (SDQ)

Considering the severity of total difficulty (SDQ), the scores were categorized as Normal, Borderline and Abnormal (Bakare et al, 2010) as shown in Figure 4.3 below. In all, 8.6% reported abnormality in general mental health. Also, 17.5% of the participants had abnormal conduct problem which was the most prevalent symptoms among the students followed by peer problem (10.1%) while those that belong to borderline category was also highest for peer problem (29%). However, 92.25% of the participants were screened without clinical challenge for hyperactivity.

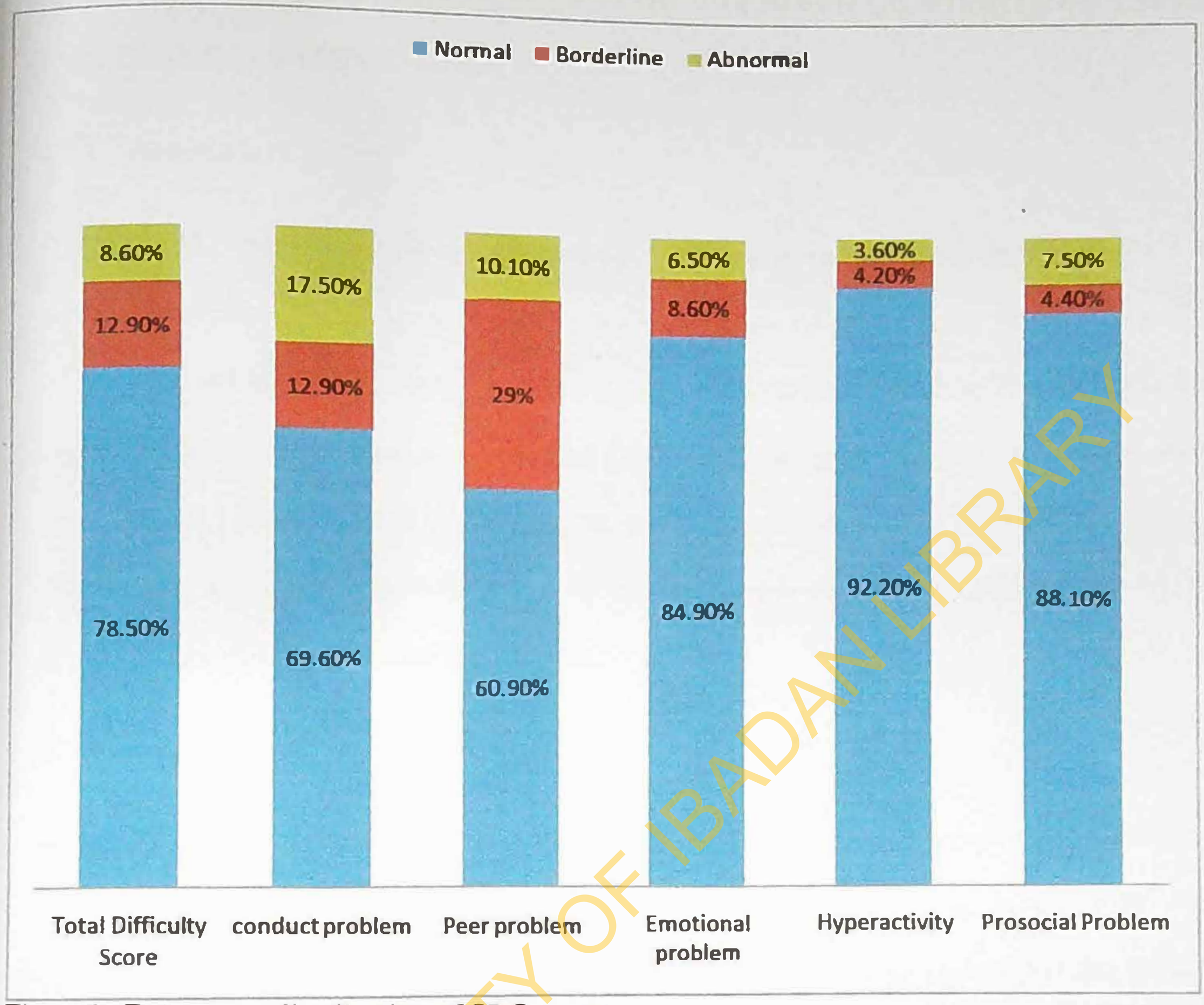

Figure3: Frequency distribution of SDQ scores

4.7 DIFFERENCE IN THE MEAN SCORES OF PSYCHOSOCIAL FUNCTIONS USING INDEPENDENT SAMPLE T-TEST

4.7.1 Self-esteem

Out of the 477 respondents that completed the 10 item questionnaire on self-esteem, 59.1% were females. Self-esteem mean score for male (18.75±3.48) was not significantly different from that of female participants (18.53±3.25) ($p = 0.42$). Also, participants residing in rural areas had significant lower mean score on self-esteem (17.76±3.01) compared to those residing in urban areas (19.27±3.49) ($p < 0.001$). Similarly, the result was also significant among those who did 19.19±3.40) and did not (18.06±3.19) have friends of opposite sex ($p<0.001$). However, the result was not significant for the family type.

4.7.2. Depression

In table 3, depression mean score was significantly ($p=0.028$) higher among male (17.53±8.92) than female (15.05±8.93) counterparts as well as among those living in the rural areas (17.78±9.60) than those from urban (15.92±8.48). Moreover, it was also higher for those in private schools (18.23±8.71) than their counterparts in public schools (16.20±8.98) ($p=0.041$). Whereas, having a friend of opposite sex seemed not to pose any effect on depression level as they had almost the same mean scores. The result for family type figured out difference in the two groups as the score was higher among those from a polygamous families and the difference was almost significant ($p=0.097$).

4.7.3. Conduct problem:

Conduct problem seems to be individualistic as many of the factors gave indifferent results. Although, male participants (2.89±2.13) had higher mean scores in the externalizing behavioural problem than their female counterparts (2.36±1.89) and the difference was significant (p=0.005). Moreover, the differences were not significant for other categories like place of residence, having friends of opposite sex and family type

4.7.4. Peer problem

It was evident (in Table 3) that there was a wide gap between adolescents who reside urban and rural areas when it comes to mutual relationship with others colleagues. The urban dwellers among the students had a lower mean score (2.76±1.80) compared to their counterpart residing in the rural areas (3.33± 2.07) (p=0.002). However, the mean differences were not significant across other demographic variables.

Table 4.3 Differences in psychosocial functions by demographic variables using t-test

variables	Self-esteem		Depression		Conduct problem		Peer problem	
	Mean	t-value	Mean	t-value	Mean	t-value	Mean	t-value
Sex								
Male	18.75	1.906	17.53	2.236*	2.89	2.81**	2.92	-0.699
Female	18.53		15.65		2.36		3.05	
Location								
Rural	17.76	-4.487**	17.78	2.087*	2.87	1.458	3.33	3.044*
Urban	19.27		15.92		2.58		2.76	
Having friends of opp. sex								
Yes	19.12	3.315**	16.56	0.294	2.71	1.609	2.87	-1.308
No	18.07		16.31		2.40		3.11	
Family type								
Monogamy	18.77	1.369	16.06	-1.665	2.60	-0.129	2.90	-1.959
Polygamy	18.24		17.77		2.63		3.32	
School type								
Private	19.27	2.106*	18.23	2.05*	2.61	0.145	2.81	-1.13
Public	18.49		16.20		2.57		3.05	

*p < 0.05, **p<0.001

4.8 DIFFERENCE IN THE MEAN SCORES OF PSYCHOSOCIAL FUNCTIONS USING ANALYSIS OF VARIANCE (ANOVA)

4.8.1 Self-esteem

In Table 4.4, the difference in the self-esteem scores was significant (p=0.04) between those whose fathers had post secondary education (19.17±3.41) and those with no formal education (18.25±3.33). Also, similar result emerged for mother's education. Parents' occupations were partitioned into three groups namely, farming/trading, civil servant and private company workers. The difference was significant (p=0.003) among father's occupation categories with the civil servants' children scoring the highest (19.14±3.08) and farming/trading the least (17.86±3.45). However, the difference was not significant between farming/trading and private workers' children. The result for mother's occupations revealed an insignificant difference as well. Hence, it could be suggested that children are likely to be more proud of their fathers' occupation than their mothers'.

4.8.2 Depression

The mean difference in depression score was significant (p = 0.006) across family status: in particular, between those whose parents are together (16.20±8.98) and those separated (20.69±9.35). Mean depression score was highest (20.69) among the separated group but lowest (15.72±7.77) in the divorced group. Parents' education as well as occupation showed no significant difference on depressiveness.

4.8.3 Conduct problems

Though, adolescents from divorced parents had the highest mean score (3.39±1.20) in conduct problem while those whose parents are living together scored the least (2.57±1.11) but the difference was not significant. Also, there was no significant difference in the conduct problem

mean scores across parents' highest education attained and occupations. Despite the statistical insufficient evidence, worth mentioning is the variation within the groups. It could be inferred from Table 4 that adolescent from rural areas might have higher tendency of misconducts than those from urban areas.

4.8.4 Peer problem

The differences in the peer problem mean scores within all the factors considered under this section were non significant

Table 4.4 Differences in psychosocial functions by demographic variables using Analysis of Variance (ANOVA)

Variables	Self-esteem		depression		Conduct problem		Peer problem	
	Mean	F	mean	F	Mean	F	Mean	F
Family status								
Parents are together	18.67	0.081	16.20	2.243*	2.51	1.984	2.95	0.513
Parents are divorced	18.20		15.72		3.00		3.10	
Parents are separated	18.73		20.69		3.39		3.25	
Single mother	18.79		17.59		2.45		3.29	
Father's education								
No formal education	18.25	2.370*	17.51	0.815	2.63	0.609	2.92	1.782
Up to sec. education	18.65		15.91		2.62		3.34	
Post sec. education	19.17		16.77		2.50		2.81	
Father's occupation								
Farming/trading	17.86	2.663*	16.40	0.706	2.52	0.126	3.08	0.128
Civil servant	19.14		16.44		2.62		2.96	
Private worker	18.89		18.14		2.63		3.07	
Mother's education								
No formal education	18.66	2.107	17.37	1.088	2.82	1.714	3.04	0.559
Up to sec. education	18.18		15.94		2.60		3.13	
Post sec. education	19.14		17.03		2.43		2.89	
Mother's occupation								
Farming/trading	18.37	1.150	16.46	0.205	2.49	0.807	3.04	1.150
Civil servant	19.0663		16.79		2.74		2.85	
Private company worker	18.94		17.63		2.72		3.38	

*p < 0.05, **p <0.01

4.9 INTERRELATIONSHIP BETWEEN AGE AND PSYCHOSOCIAL SYMPTOMS AMONG ADOLESCENTS IN SCHOOLS

In Table 4.5, higher scores on self-esteem correlated significantly with lower scores on most of the sub-scales of strength and difficulty (SDQ) and the CES-DC except the positive affect (r = 0.183, p<0.001) and prosocial behaviour (r=.0.114, p<0.05). Suggesting high self esteem was protective for some psychosocial symptoms. Similarly, higher scores on conduct and peer problem also significantly correlate with prosocial behaviour and positive affect. As expected, strength and difficulty (SDQ) total scores and depression score were moderately correlated (r = 0.509, p<0.001). The strongest relationship was found between emotional symptoms and difficulty scores (r = 0.760, p<0.001). However, age was not significantly related with some of the sub-scales of the SDQ and CES-DC except with lower scores on hyperactivity (-0.135, p<0.001), pro-social behaviour (-0.124, p<0.001) and positive affect (-0.124, p<0.001).

Table4.5 Correlates of psychosocial functions

	Age	Self-esteem	Conduct problem	Peer problem	Emotional symptoms	Hyper activity	Prosocial behaviour	Total difficulty	Positive affect	Depression score
Age	1									
Self-esteem	0.031	1								
Conduct problem	0.047	-0.182**	1							
Peer problem	0.005	-0.198**	0.266**	1						
Emotional symptoms	-0.028	-0.135**	0.428**	0.417**	1					
hyperactivity	-0.135**	-0.182**	0.420**	0.404**	0.336**	1				
Prosocial behaviour	-0.124**	0.114*	-0.193**	-0.278**	-0.133**	-0.319**	1			
Total difficulty	0.019	-0.235**	0.727**	0.684**	0.760**	0.736**	-0.308**	1		
Positive affect	-0.124**	0.183**	-0.266**	-0.249**	-0.185**	-0.351**	0.434**	-0.340**	1	
Depression score	0.030	-0.285**	0.373**	0.324**	0.486*	0.305**	-0.216**	0.509**	-0.340**	1

***p < 0.05, **p<0.001**

4.10 MULTILEVEL LINEAR REGRESSION FOR PREDICTORS OF DEPRESSION AMONG ADOLESCENTS IN SCHOOLS IN IKERE-EKITI

In Table 4.6 below, the intercept is 17.20, that is, the unadjusted overall school average depression score for the population is 17.20. Moreover, results from the three models were compared using Akaike Information Criterion (AIC) as a test for goodness of fit. Model 3 was therefore reported as it has the least AIC value. Also, between-students variation (residual) is almost 9 times the between-schools variance (8.37) indicating that a substantial amount of variation is due to within school differences.

The ICC for depression model: $\rho = \frac{\sigma^2}{\sigma^2+\mu^2} = \frac{8.37}{8.37+73.97} = 0.1017$. Suggesting, 10.17% of the variation was due to the variations between schools.

Gender fixed effect estimate is 2.52 and significant (p = 0.013) which implies that the expected depression score is 2.52 more for boys than for girls. Children from monogamous family were 0.40 (not significant) less in the average depression scores than those from polygamous families. Similarly, family status did not substantially predict depressive symptoms. Though, the mean depression score was 1.27 less for among those whose parents are living together against those whose parents are single mothers. However, parents' occupation, parents' level of education and having friends of opposite sex could not significantly predict depression score among adolescents in schools.

Moreover, for the male adolescents residing in the same environments, a unit rise in self-esteem reduced the mean depression level by 0.40units (p=0.006). Likewise, a unit rise in adolescents conduct disorders score increased the mean depression score by 0.76 units (p=0.004) while a unit rise in their emotional symptoms score increased the depression level by 1.43units (p<0.001).

Meanwhile, pro-social behaviour was protective (though, not insignificant) against depression as expected.

Table 4.7 showed that the average depression score among adolescents in the rural areas was 2.17 (p=0.032) higher than that of their counterparts in urban areas. However, the predicted depression means score was not significant between private and public schools.

Table 4.6: Individual level predictors of depression among adolescents in schools in Ikere-Ekiti: described by linear multilevel regression analysis, 2013

predictors	Empty variable	Model with individual level variables	Model with individual and area level variables
	Model 1	Model 2	Model 3
parameter	Estimate (95% CI)	Estimate (95% CI)	Estimate (95% CI)
Intercept	17.20(13.95,20.43)**	25.79(12.22, 3938)**	23.62(9.25, 37.99)**
Sex			
Male		2.83(0.98, 4.67)*	2.52(0.54, 4.50)*
Female		Ref	Ref
Family type			
Monogamy		-0.32(-2.42, 1.78)	-0.404(-2.67, 1.86)
Polygamy		Ref	Ref
Family status			
Parents are together		-1.28(-4.75, 2.19)	-1.27(-4.89, 2.35)
Parents are separated		-0.31(-7.02, 6.41)	-1.05(-8.34, 6.24)
Divorced		1.24(-3.56,6.02)	1.55(-3.43, 6.53)
Single mother		Ref	Ref
Father's education			
No formal education		-0.28(-3.76, 3.21)	-0.12(-3.74, 3.49)
Pry/sec. education		-0.81(-4.17, 2.56)	-0.88(-4.38, 0.63)
Post secondary education		Ref	Ref
Father's occupation			
Farming/trading		-1.86(-4.36, 0.64)	-2.14(-4.79, 0.52)
Civil servant		-1.81(-4.06, 0.45)	-1.16(0.34, -3.56)
Employee of private org.		Ref	Ref
Mother's education			
No formal education		-1.60(-5.18, 1.98)	-1.93(-5.62, 1.75)
Up to secondary education		-0.71(-4.04, 2.62)	-0.12(-3.63, 3.38)
Post sec. education		Ref	ref
Mother's occupation			
Farming/trading		-0.43(-3.59, 2.73)	-0.53(-3.97, 2.91)
Cilvil servant		-0.83(-4.01. 2.34)	-1.18(-4.59, 2.23)
Employee of private org.		Ref	Ref
Having friends of opp. Sex			
Yes		-0.37(-2.23, 1.47)	0.13(-1.87, 2.13)
No		Ref	Ref
Age		-0.04(-0.69, 0.62)	-0.07(-0.77, 0.62)
Self-esteem		-0.50(-0.77, -0.23)**	-0.40(-0.69, -0.12)*
Emotional symptoms		1.45(0.99, 1.91)**	1.43(0.94, 1.92)**
Conduct problem		0.76(0.26, 1.25)*	0.76(0.24, 1.28)*
Peer problem		0.34(-0.19, 0.88)	0.35(-0.21, 0.92)
Pro-social behaviour		-0.37(-0.83, 0.08)	-0.44(-0.94, 0.05)
Hyperactivity		-0.05(-0.55, 0.44)	-0.09(-0.62, 0.43)

Table 4.7: Contextual school level factors of depression among adolescents in schools in Ikere-ekiti: described by linear multilevel regression analysis, 2013.

	Empty variable	Model with individual level variables	Model with individual and area level variables
Parameter	Model 1 Estimate (95% CI)	Model 2 Estimate (95% CI)	Model 3 Estimate (95% CI)
Location			
Rural			2.17(0.18, 4.17)*
Urban			ref
School type			
private			1.69(-0.74, 4.14)
public			ref
Intercept	8.37	0.30	0.65
Random variance	73.97	58.26	59.39
Model fit statistics	3399.28	2194.74	1999.37
AIC			

*p<0.05, **p<0.001

4.11 PREDICTORS OF PEER PROBLEMS AMONG ADOLESCENTS IN SCHOOLS IN IKERE BY MULTILEVEL LINEAR REGRESSION ANALYSIS

As shown in Table 4.8, model1 intercept is 3.12, indicating that the overall expected mean peer problem score is 3.12 in the absence of all the predictors of peer problem.

The ICC for peer problem model: $\rho = \frac{\sigma^2}{\sigma^2+\mu^2} = \frac{1.02}{1.02+3.12} = 0.2464$ suggesting 24.64% of the total variation could be attributed to between school differences. Model 3 has the best fit and thus reported below:

The analysis result in this study (model 3, third column) indicated that demographic variables could not substantially predict peer problem. Though, there was a marginal alteration in the result with the addition of school level predictors. Peer problem mean score for boys was 0.12 lesser than for girls. Also, those from monogamous families with similar features are expected to be 0.05units lower in peer problem mean score than their counterparts from polygamous families.

Moreover, respondents whose parents are living together are least affected by peer problem while those from single mother, the most. This might have resulted from isolation as a result of lack of connectedness between the parents. In addition, parents' education levels are not significantly related to peer problem but it worth mentioning that participants with parents of lower educational attainment peer better than others. However, those whose parents are civil servants scored least on peer problem scale followed by their colleagues whose parents are farmers/traders as compared to those belonging to workers of private companies' category. Not only this, table 4.9 also revealed that adolescents who had a friend of opposite sex are 0.15 less in the expected peer problems symptoms' scores.

Furthermore, among the individual level variables assessed in the study, only emotional symptoms and hyperactivity were significant in the presence of other factors. Although, pro-social problem was almost significant (p=0.06). Peer problem mean score reduced by 0.03(not significant) with a year increase in age. Additionally, a unit increase in pro-social behaviour also resulted to 0.07 decrease in peer problem. Here, there was a marginal effect as the value reduced from 0.1($p<0.05$) to 0.07(not significant) before and after the addition of school level factors. Also, a unit increase in self-esteem mean score, reduced the peer problem mean score by 0.02 ($p=0.44$, not significant): suggesting that self-satisfaction and thinking positive towards oneself and others may help students getting along with other colleagues and people of their ages. Moreover, a unit rise in the adolescents' emotional symptoms score raised the average peer problem score by about 0.28 ($p<0.001$) while it was increased by 0.24 ($p<0.001$) for a unit rise in hyperactivity mean score. Suggesting that being nervous or worried and unable to pay attention might deter students from getting along well with colleagues.

Inclusion of contextual factors has a marginal effect on the significance of father highest level of education and prosocial behaviour indicating that the choice of school or location may not be completely independent of fathers' highest level of education. Also, it improved the fitness of the model as it reduced AIC from 1265 to 1157. However, the expected peer problem symptom average score for adolescents in the urban area is 2.63 but 2.44 for those from the rural areas while private school students have an average of 0.39 lesser in the mean peer problem symptoms scores than the aggregate mean score of public schools.

Table 4.8: Individual and explanatory variables for peer problems among adolescents in schools in Ikere-Ekiti, Nigeria

	Empty model	Model with individual level variables	Model with individual and area level variables
parameter	Model 1 Estimate (95% CI)	Model 2 Estimate (95% CI)	Model 3 Estimate (95% CI)
Intercept	3.20(2.11, 4.29)**	4.39(1.61, 7.19)**	3.78(0.79, 6.79)*
Sex			
Male		-0.31(-0.70,0.08)	-0.12(-0.54, 0.30)
Female		Ref	Ref
Family type			
Monogamy		-0.09(-0.53, 0.35)	-0.05(-0.53, 0.43)
Polygamy		Ref	Ref
Family status			
Parents are together		-0.24(-0.96, 0.47)	-0.37(-1.14, 0.39)
Parents are separated divorced		-0.18(-1.59, 1.24)	-0.06(-1.59, 1.48)
Single mother		-0.55(-1.55, 0.44)	-0.56(-1.61, 0.48)
		Ref	Ref
Father's highest education			
No formal education		0.18(-0.56, 0.91)	0.14(-0.62, 0.90)
Up to secondary education		0.79(0.08, 1.49)*	0.66(-0.07, 1.40)
Post secondary education		Ref	Ref
Father's occupation			
Farming/trading		-0.03(-0.56, 0.49)	-0.10(-0.66, 0.46)
Civil servant		-0.09(-0.56, 0.39)	-0.12(-0.62, 0.38)
Employee of private org.		Ref	Ref
Mother's highest edu.			
No formal education		-0.30(-1.05, 0,46)	-0.25(-1.03, 0.53)
Up to secondary education		-0.43(-1.13, 0.27)	-1.05(-1.05, 0.42)
Post sec. education		Ref	Ref
Mother's occupation			
Farming/trading		-0.42(-1.08,0.23)	-0.37(-1.10, 0.35)
Cilvil servant		-0.38(-1.05, 0.28)	-0.27(-0.99, 0.45)
Employee of private org.		Ref	Ref
Having friends of opp. Sex			
Yes		-0.23(-0.62, 0.16)	-0.16(-0.58, 0.26)
No		Ref	Ref
Age		-0.02(-0.16, 0.12)	-0.03(-0.17, 0.12)
Self-esteem		-0.04(-0.10, 0.02)	-0.02(-0.08, 0.04)
Emotional symptoms		0.26(0.16, 0.36)**	0.28(0.18, 0.39)**
Conduct problem		0.01(-0.09, 0.02)	-0.02(-0.13, 0.09)
Depressive affect		0.02(-0.03, 0.06)	0.02(-0.03, 0.07)
Prosocial behaviour		-0.10(-0.19, -0.01)*	-0.07(-0.17, 0.04)
Hyperactivity		0.20(0.10, 0.30)**	0.24(0.13, 0.35)**

*p<0.05, **p<0.001

Table 4.9: Contextual school level factors of peer problem among adolescents in schools in Ikere-ekiti: described by multilevel linear regression analysis, 2013.

	Empty variable	Model with individual level variables	Model with individual and area level variables
Parameter	Model 1 Estimate (95% CI)	Model 2 Estimate (95% CI)	Model 3 Estimate (95% CI)
Location			
Rural			0.25(-0.17, 0.67)
Urban			Ref
School type			
Private			-0.39(-0.90,0.12)
Public			Ref
Intercept	1.02	0.03	0.03
Random variance	3.13	2.59	2.63
Model fit statistics	**1930.64**	**1265.38**	**1157.42**
AIC			

*p< 0.05, **p < 0.001

4.12 CONDUCT DISORDERS AMONG ADOLESCENTS IN SCHOOLS IN IKERE L.G.A AS DESCRIBED BY MULTILEVEL LINEAR REGRESSION

Table 4.10 shows that the grand mean for an expected conduct problem symptom scores is 2.17. Implying, when other predictors equal zero, the average conduct problem score is expected to be 2.17. Also, ICC for conduct problem model: $\rho = \frac{\sigma^2}{\sigma^2+\mu^2} = \frac{1.06}{1.06+3.52} = 0.2314$ i.e. 23.14% of the variations in the conduct means score was due the between school variations.

Conduct disorder's mean score was 0.25 ($p = 0.276$, not significant) higher for male participant than their female counterparts. This is actually observable in the daily happenings. Family type had an insignificant relationship with conduct problem. Also, family status could not significantly predict conduct problem among adolescents

Furthermore, those having friends of opposite scored 0.62 ($p< 0.05$) higher in exhibiting conduct disorders' symptoms than their counterpart that did not have. In table 4.10, among the tested covariates, it was not evident that age could predict conduct disorders. Though, a year increase in age increased the expected value of conduct problem score by 0.065. Also, relationship between self-esteem and conduct disorders was not significant but it worth noting that it seemed to be protective for conduct problem as a unit rise in the students' self-esteem led to 0.044 reductions in conduct disorders score among the participants.

Actually, a unit increase in emotional problem means score raised conduct disorders among adolescents in school mean value by 0.23($p<0.001$). That is, students that have emotional disorders are more likely to have a general behavioural conduct disorders. This implies conduct disorders are being influenced by an internalizing factors rather than external attributes. Positive affect has also shown to be protective against conducts disorders. It is evident from the Table 10 that a unit rise in positive affect symptoms, predicted conduct disorders means score for the students to be 8.5% ($p = 0.022$) less.

In Table 4.11, addition of higher level factors increased the fittingness of the model. Overall, the expected values for conduct problem average score for private schools was 0.206(not significant) higher than the public's while it was 0.148 less for the urban aggregate conduct mean score than rural areas.

Table 4.10: Explanatory variables for conduct disorders among adolescents in schools in Ikere-Ekiti by multilevel linear modeling

	Empty model	Model with individual level variables	Model with individual and area level variable
Variable	**Model 1** Estimate(95%CL)	**Model 2** Estimate(95%CL)	**Model 3** Estimate(95%CL)
Intercept	2.80(1.69, 3.91)**	1.72(-1.23, 4.67)	2.18(-1.03, 5.38)
Sex			
Male		0.19(-0.24, 0.62)	0.26(-0.21, 0.72)
Female		Ref	Ref
Family type			
Monogamy		0.13(-0.35, 0.60)	0.01(-0.51, 0.53)
Polygamy		Ref	Ref
Family status			
Parents are together		0.15(-0.62, 0.93)	0.02(-0.81, 0.86)
Parents are separated		-0.38(-1.92, 1.16)	-0.59(-2.27, 1.10)
divorced		0.86(-0.23, 1.94)	0.83(-0.32, 1.97)
Single mother		Ref	Ref
Fathers highest education			
No formal education		-0.14(-0.94, 0.66)	-0.15(-0.98, 0.68)
Up to secondary education		0.02(-0.76, 0.79)	-0.02(-0.83, 0.79)
Post secondary education		Ref	Ref
Fathers occupation			
Farming/trading		-0.08(-0.65, 0.50)	0.02(-0.60, 0.63)
Civil servant		0.010(-0.61, 0.41)	0.01(-0.54, 0.56)
Employee of private org.		Ref	Ref
Mother's highest education			
No formal education		0.58(-0.24, 1.40)	0.59(-0.25, 1.44)
Up to secondary education		0.08(-0.68, 0.85)	0.13(-0.68, 0.94)
Post sec. education		Ref	Ref
Mother's occupation			
Farming/trading		-0.22(-0.93, 0.49)	-0.36(-1.15, 0.42)
Cilvil servant		0.04(-0.68, 0.76)	-0.06(-0.84, 0.72)
Employee of private org.		Ref	Ref
Having friends of opp. Sex			
Yes		0.57(0.15, 0.99)*	0.63(0.17, 1.08)*
No		Ref	Ref
Age		0.09(-0.06, 0.24)	0.06(-0.09, 0.22)
Selfesteem		-0.05(-0.11, 0.01	-0.04(-0.11, 0.03)
Emotional symptoms		0.22(0.12, 0.32)**	0.23(0.12, 0.33)**
Peer problem		0.04(-0.08, 0.16)	0.03(-0.09, 0.15)
Positive affect		-0.09(-0.16, -0.03)	-0.08(-0.16, -0.01)*

*p<0.05, **p<0.001

Table 4.10: Explanatory variables for conduct disorders among adolescents in schools in Ikere-Ekiti by multilevel linear modeling

	Empty model	Model with individual level variables	Model with individual and area level variable
Variable	Model 1 Estimate(95%CL)	Model 2 Estimate(95%CL)	Model 3 Estimate(95%CL)
Intercept	2.80(1.69, 3.91)**	1.72(-1.23, 4.67)	2.18(-1.03, 5.38)
Sex			
Male		0.19(-0.24, 0.62)	0.26(-0.21, 0.72)
Female		Ref	Ref
Family type			
Monogamy		0.13(-0.35, 0.60)	0.01(-0.51, 0.53)
Polygamy		Ref	Ref
Family status			
Parents are together		0.15(-0.62, 0.93)	0.02(-0.81, 0.86)
Parents are separated		-0.38(-1.92, 1.16)	-0.59(-2.27, 1.10)
divorced		0.86(-0.23, 1.94)	0.83(-0.32, 1.97)
Single mother		Ref	Ref
Fathers highest education			
No formal education		-0.14(-0.94, 0.66)	-0.15(-0.98, 0.68)
Up to secondary education		0.02(-0.76, 0.79)	-0.02(-0.83, 0.79)
Post secondary education		Ref	Ref
Fathers occupation			
Farming/trading		-0.08(-0.65, 0.50)	0.02(-0.60, 0.63)
Civil servant		0.010(-0.61, 0.41)	0.01(-0.54, 0.56)
Employee of private org.		Ref	Ref
Mother's highest education			
No formal education		0.58(-0.24, 1.40)	0.59(-0.25, 1.44)
Up to secondary education		0.08(-0.68, 0.85)	0.13(-0.68, 0.94)
Post sec. education		Ref	Ref
Mother's occupation			
Farming/trading		-0.22(-0.93, 0.49)	-0.36(-1.15, 0.42)
Cilvil servant		0.04(-0.68, 0.76)	-0.06(-0.84, 0.72)
Employee of private org.		Ref	Ref
Having friends of opp. Sex			
Yes		0.57(0.15, 0.99)*	0.63(0.17, 1.08)*
No		Ref	Ref
Age		0.09(-0.06, 0.24)	0.06(-0.09, 0.22)
Selfesteem		-0.05(-0.11, 0.01	-0.04(-0.11, 0.03)
Emotional symptoms		0.22(0.12, 0.32)**	0.23(0.12, 0.33)**
Peer problem		0.04(-0.08, 0.16)	0.03(-0.09, 0.15)
Positive affect		-0.09(-0.16, -0.03)	-0.08(-0.16, -0.01)*

*p<0.05, **p<0.001

Table 4.11: Contextual school level factors of conduct disorders among adolescents in schools in Ikere-ekiti: described by multilevel linear regression analysis, 2013.

	Empty variable	Model with individual level variables	Model with individual and area level variables
Parameter	Model 1 Estimate (95% CI)	Model 2 Estimate (95% CI)	Model 3 Estimate (95% CI)
Location			
Rural			0.15(-0.31, 0.60)
Urban			Ref
School type			
private			-0.21(-0.77, 0.35)
public			Ref
Intercept	1.06	0.43	0.4
Random variance	3.52	3.04	3.13
Model fit statistics	1987.66	1315.19	1205.26
AIC			

*p< 0.05, **p < 0.001

CHAPTER FIVE

5.1 GENERAL DISCUSSION

The results presented here provide insight into psychosocial problems that might be ravaging adolescents in schools in Ikere LGA. In order to provide a conservative prevalence estimate, only adolescents with severe behavioural problem's (SDQ) scores were considered to have mental health problems. The procedure adopted in this study is in line with the method applied by Raven-Sieberer et al (2009).

More than a quarter of the participant scored above cut-off on the depression scale (CES-DC). Actually, the prevalence of depression found in our study was very high compared to what was found in some previous studies (Ahangar et al, 2012, Raven-Sieberer et al (2009). We found that depression was shown to be more prevalent among boys than girls. This result is similar to what was reported for Thai adolescents in a research conducted in Thailand where boys had 19% and girls had 17% (Trangkasombat and Rujiradarporn, 2012) in contrast to the common reports that girls took a lead (Ahangar et al, 2012; Massip et al, 2010; Bettge et al, 2008; Keller, 2010). Reasons for this disparity might not be far from socio-cultural differences as expectations might be too high for boys than girls. Some parents believe that boys are more important and are expected to perform better in all, even academically. Failure to meet up with this demand may result in depression.

Also, boys scored higher in the depressive symptoms sub-scales except in the positive affect sub-scale. This is in contrast to what Bella study group (2008) found in a research conducted among German adolescents but it is supported by another study where boys scored higher than girls (Trangkasombat and Rujiradarporn, 2012). Moreover, depression score was more prevalent

among adolescents from families whose parents are separated but the least among those whose parents are together. It could be suggested that parental care has a role to play in preventing depression because the burden due to parents' separation could clamp down on children which may lead to psychological stress.

In addition, those that belong to depressed group also exhibited significantly higher conduct disorders symptoms in conformity with Colman et al (2009) study report. This implies, general externalizing bad behaviours could be a result of depression which might be too clinical to be observed. All the protective factors had negative correlation with depression. Therefore, more emphases should be laid on how these factors can be enhanced in order to minimize depression in adolescents. However, all the symptoms of difficulties together with the total difficulty have positive association with depression. Self-esteem had a negative correlation with depression and showed a significant predictivity. Similarly, previous studies revealed that a boost in self-esteem equally increases ones happiness perhaps, reduces depression (Bettge et al, 2008; Manning, 2007; Yaacob et al, 2009).

The difficulty (SDQ) symptom scale revealed various levels of mental health problem severity whilst conduct and peer problems were found to be more prevalent among the clinical problem cadres. This outcome is in agreement with many of the past studies (Bernstein et al, 2012). However, this has justified the choice of study variable and target population in the current study. It has been observed that there is a digression in the choice of career pursuit among the youths in Ikere LGA as truancy among adolescents in schools, cultism, promiscuity, robbery and political thuggery have become the order of the day contrary to the scholarship the inhabitants used to be known for (Ajayi et al, 2010; Owuamanam and Bankole, 2013). Similar to the previous work of Colman et al (2009), we found that conduct problem has a strong and positive

strong and positive relationship with the total difficulty as well as depression. It was also, found that, self esteem has a negative relationship with the psychosocial difficulty symptoms. Those with high self-esteem might find it ridiculous indulging in violence or disobeying rules and regulations since they are more conscious about the way people feel about them and self satisfaction.

In addition, socio-demographic variables do not have substantial difference in the mean scores of conduct and peer problems except gender and area of residence. Boys exhibited more externalizing problem than their counterpart just like other previous studies (Bakare et al, 2010; colman et al, 2009; Detels, 2012). Also, those from the rural areas showed higher symptoms of peer problem. The cause of this might not be far from low self-esteem and the fear of being influenced wrongly coupled with depression which has been identified to be highly prevalent among the group under study. Moreover, lack of basic needs and social exposure with inability to meet up with demands from peers may trigger the solitary attitude and sadness. Consequently, they might be discouraged from coping with colleagues but staying alone or rather get closer to older ones for dependency.

At individual level, sex, self-esteem, emotional symptoms and conduct problem are significant predictors of depression. Also, self-esteem was predicted to be protective for depression while emotional symptoms and conduct problems are the risk symptoms. This is in consonant with many findings in the literature (Ahangar et al, 2012, Barnow et al, 2005). Among the school level factors, location was found to be a significant predictor for depression. However, this report supports the finding in a cross-sectional examination of prevalence of depression conducted in the US (Probst et al, 2006).

predictive capacity. These variables are more of internalizing and clinical rather than being behavioural. It could be suggested that, having difficulty in getting along with peers has little to do with students' background. However, being in a moody condition and inattentive to friends and colleagues may weaken peer connectedness, hence, resulting to hatred and bullying.

In assessing adolescents' friendship patterns, emotional symptoms and positive affects can predict behavioural problems in adolescents. On the contrary, the mean conduct problem score was higher for adolescents in schools that have friends of opposite sex than those that do not have. This result observed might be due to possession of higher self-esteem which has been identified to be positively correlated with externalizing behaviour as reported in another study (Barnow et al, 2005). Emotional symptoms have a positive prediction for conduct problems as its expected mean score is said to increase with a unit rise in the former. This is in accord with past study (Barnow et al, 2005).

Moreover, the statistical method adopted in this research work was judiciously used and very appropriate since the effect of clusters uniqueness in the three regressional analyses were observed and all the variance component partition estimates are positive and greater than 0.05 suggested by Kristen Ringdal (http://essedunet.nsd.uib.no). However, it was observed that school connectedness can influence students' behaviour and their psychological well being as a result of within school interactions. Nevertheless, multilevel regression analysis is more likely to present a more accurate and conservative results than classical regression in this kind of school based research where there are nested group structures.

5.2 CONCLUSION AND SUMMARY

This study identified four predictors of depression. Gender has been identified to be a qualified predictor of depression but age did not significantly predict depression. However, there was a higher score of depression among male adolescents. Overall, More of the psychosocial problems are more prevalent among male participants than their female counterparts contrary to the general perception. Suggesting mental health among male adolescents should also be taken seriously. These findings recognize self-esteem, emotional symptoms and conduct problems as covariates for depression. Moreover, hyperactivity and emotional symptoms were identified as predictors for peer problem while there was no evidence of predictivity among socio-demographic variables. Similarly, having a friend of opposite sex, emotional symptoms and positive affect explained conduct disorders among adolescents. Moreover, school level variables were explored and found worthy of inclusion while efficacy of multilevel modelling in public health research was more buttressed.

5.3 RECOMMENDATION

Nigerian regular and special educational institutions for children and adolescents lack school-based mental health programs. Programs that can boost prosocial behaviour and self-esteem among adolescents should be encouraged for their buffering effect on psychosocial dysfunctionings. The high prevalence of behavioral problems found among this group is a wakeup call for policy makers to encourage and establish school-based mental health programs in Nigerian schools. It is hereby recommended that a multidisciplinary and holistic approach is required in the treatment of adolescent psychosocial disorders.

Parents are advised to pay more attention to their wards and try as much as possible to stay together for them not to get exposed to peer and social-economic pressure. Similar studies can indulge adolescents on the street. More comprehensive research into the risk factors of psychosocial disorders among adolescents in Ekiti state and Nigeria at large must be intensified among mental health researchers. Finally, application of multilevel regression analyses should be more explored by public health researchers where group data are almost unavoidable.

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APPENDIX I

MODELLING PREDICTORS OF PSYCHOSOCIAL DISORDERS AMONG ADOLESCENTS IN SCHOOLS IN IKERE-EKITI LOCAL GOVERNMENT AREA, NIGERIA

SECTION A: BACKGROUND INFORMATION *(Tick the code as appropriate)*

1. What is your sex a) Male b) Female
2. What is your current Age **fill the exact age** ( )
3. What is your Height **fill the exact height** ( )
4. What is your weight **fill the exact weight** ( )
5. What is the name of your school

.....

6. What class are you ( )
7. What is your religion a) Christianity b) Islam c) Others.....
8. Area of residence a) Rural area b) Urban area
9. Ethnicity a) Yoruba b) Hausa/Fulani c) Igbo d) Others.....
10. Family type a) Monogamy b) Polygamy
11. Family status a) Parents are together b) Parents are Divorced c) Parents are separated d) Single Mother
12. Father's highest level of education a) No formal education b) Primary c) Secondary d) Tertiary e) No idea
13. Father's occupation a) Farming b) Trading c) Civil servant d) Employee of Private organisation e) Others.....
14. Mother's highest level of education a) No formal education b) Primary c) Secondary d) Tertiary e) No idea
15. Mother's occupation a) Farming b) Trading c) Civil servant d) Employee of Private organisation e) Others.....
16. Do you have friends of the opposite sex a) Yes b) No
17. Have you felt disappointed / jilted by a friend who is an opposite sex a) Yes b) No
18. Which of the following have you ever done with an opposite sex (You can tick more than one)
    - *Kissing/Caressing*
    - *Sex*
    - *Petting*

18b. Which of the following have you ever done with a person of the same sex (You can tick more than one)

- *Kissing/Caressing*
- *Sex*
- *Petting*

SECTION B: PSYCHOSOCIAL OUTCOMES

A. ROSENBERG SELF ESTEEM SCALE (RSES)

Below is a list of statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.

S/N		Strongly Agree	Agree	Disagree	Strongly Disagree
1	On the whole, I am satisfied with myself				
2	At times I think I am no good at all				
3	I feel that I have a number of good qualities				
4	I am able to do things as well as most other people				
5	I feel I do not have much to be proud of				
6	I certainly feel useless at times				
7	I feel that I'm a person of worth, at least on an equal plane with others				
8	I wish I could have more respect for myself				
9	All in all, I am inclined to feel that I am a failure				
10	I take a positive attitude toward myself				

Note: The filling of this questionnaire is voluntary

B. STRENGTH AND DIFFICULTY QUESTIONNAIRE (SELF RATED) *(cycle the code as appropriate)*

- For each item, please mark the box for **Not True, Somewhat True or Certainly True**.
- It would help us if you answered all items as best you can even if you are not absolutely certain or the item seems daft! Please give your answers on the basis of how things have been for you over **the last six months**.

Code	Questions	Not True	Somewhat True	Certainly True
Se1	I try to be nice to other people. I care about their feelings			
Sc1	I am restless, I cannot stay still for long			
Sa1	I get a lot of headaches, stomach-aches or sickness			
Se2	I usually share with others (food, games, pens etc.)			
Sb1	I get very angry and often lose my temper			
Sd1	I am usually on my own. I generally play alone or keep to myself			
Sb2	I usually do as I am told*			
Sa2	I worry a lot			
Se3	I am helpful if someone is hurt, upset or feeling ill			
Sc2	I am constantly fidgeting or squirming			
Sd2	I have one good friend or more*			
Sb3	I fight a lot. I can make other people do what I want			
Sa3	I am often unhappy, down-hearted or tearful			
Sd3	Other people of my age generally like me*			
Sc3	I am easily distracted, I find it difficult to concentrate			
Sa4	I am nervous in new situations. I easily lose confidence			
Se4	I am kind to younger children			
Sb4	I am often accused of lying or cheating			
Sd4	Other children or young people pick on me or bully me			
Se5	I often volunteer to help others (parents, teachers, children)			
Sc4	I think before I do things*			
Sb5	I take things that are not mine from home, school or elsewhere			
Sd5	I get on better with adults than with people my own age			
Sa5	I have many fears, I am easily scared			
Sc5	I finish the work I'm doing. My attention is good*			

C. CENTER FOR EPIDEMIOLOGICAL STUDIES DEPRESSION SCALE FOR CHILDREN (CES-DC)

Below is a list of the ways you might have felt or acted. Please check how *much* you have felt this way **during the *past week***

Code	Questions	Not At All	A Little	Some	A Lot
1	I was bothered by things that usually don't bother me				
2	I did not feel like eating, I wasn't very hungry				
3	I wasn't able to feel happy, even when my family or friends tried to help me feel better				
4	I felt like I was just as good as other kids				
5	I felt like I couldn't pay attention to what I was doing				
6	I felt down and unhappy				
7	I felt like I was too tired to do things				
8	I felt like something good was going to happen				
9	I felt like things I did before didn't work out right				
10	I felt scared				
11	I didn't sleep as well as I usually sleep				
12	I was happy				
13	I was more quiet than usual				
14	I felt lonely, like I didn't have any friends				
15	I felt like kids I know were not friendly or that they didn't want to be with me				
16	I had a good time				
17	I felt like crying				
18	I felt sad				
19	I felt people didn't like me				
20	It was hard to get started doing things				

APPENDIX II

INFORMED CONSENT FORM

Title of the study: MODELLING PREDICTORS OF PSYCHOSOCIAL DISORDERS AMONG ADOLESCENTS IN SCHOOLS IN IKERE-EKITI LOCAL GOVERNMENT AREA, NIGERIA

Investigator:

OGUNBOYO O. Femi
Department of Epidemiology, Medical Statistics.
Faculty of Public Health, College of Medicine,
University of Ibadan

Supervisor:

Dr. Onoja Matthew AKPA
Department of Epidemiology, Medical Statistics.
Faculty of Public Health, College of Medicine,
University of Ibadan

Purpose of research: The purpose of this research is to estimate the prevalence and examine the determinants of psychosocial disorders among adolescent in schools in Ikere-Ekiti local Governm ent area.

Statement of person giving informed consent: I have read the description of the research and m ade to understand that participation is voluntary and whoever that refuses to participate would not be subjected to any form of victimization.

Name of participant:.....Sign/Date.....

Name of Teacher(If applicable):.....Sign/Date.....

Name of interviewer:.....Sign/Date.....

APPENDIX III

Center for Epidemiological Studies

Depression Scale for Children (CES-DC)

The Center for Epidemiological Studies Depression Scale for Children (CES-DC) is a 20-item self-report depression inventory with possible scores ranging from 0 to 60. Each response to an item is scored as follows:

0 = "Not At All"

1 = "A Little"

2 = "Some"

3 = "A Lot"

However, items 4, 8, 12, and 16 are phrased positively, and thus are scored in the opposite order:

3 = "Not At All"

2 = "A Little"

1 = "Some"

0 = "A Lot"

Higher CES-DC scores indicate increasing levels of depression. Weissman et al. (1980), the developers of the CES-DC, have used the cutoff score of 15 as being suggestive of depressive symptoms in children and adolescents.

Center for Epidemiological Studies

Depression Scale for Children (CES-DC)

INSTRUCTIONS

Below is a list of the ways you might have felt or acted. Please check how *much* you have felt this way during the *past week*.

DURING THE PAST WEEK Not At All A Little Some A Lot

1. I was bothered by things that usually don't bother me. ____ ____ ____ ____

2. I did not feel like eating, I wasn't very hungry. ____ ____ ____ ____

3. I wasn't able to feel happy, even when my family or ____ ____ ____ ____ friends tried to help me feel better.

4. I felt like I was just as good as other kids. ____ ____ ____ ____

5. I felt like I couldn't pay attention to what I was doing. ____ ____ ____ ____

DURING THE PAST WEEK Not At All A Little Some A Lot

6. I felt down and unhappy. ____ ____ ____ ____

7. I felt like I was too tired to do things. ____ ____ ____ ____

8. I felt like something good was going to happen. ____ ____ ____ ____

9. I felt like things I did before didn't work out right. ____ ____ ____ ____

10. I felt scared. ____ ____ ____ ____

DURING THE PAST WEEK Not At All A Little Some A Lot

11. I didn't sleep as well as I usually sleep. ____ ____ ____ ____

12. I was happy. ____ ____ ____ ____

13. I was more quiet than usual. ____ ____ ____ ____

14. I felt lonely, like I didn't have any friends. ____ ____ ____ ____

15. I felt like kids I know were not friendly or that ____ ____ ____ ____ they didn't want to be with me.

DURING THE PAST WEEK Not At All A Little Some A Lot

16. I had a good time. ____ ____ ____ ____

17. I felt like crying. ____ ____ ____ ____

18. I felt sad. ____ ____ ____ ____

19. I felt people didn't like me. ____ ____ ____ ____

20. It was hard to get started doing things. ____ ____ ____ ____

SDQ – scores interpretation

APPENDIX IV

Parent rated SDQ			
	Close to average unlikely to be clinically significant	Slightly raised may reflect clinically significant problems	High substantial risk of clinically significant problems
Total difficulties score (Total 40)	0-13	14-16	17-40
Emotional symptoms score (10)	0-3	4	5-10
Conduct problems score (10)	0-2	3	4-10
Hyperactivity score (10)	0-5	6	7-10
Peer problem score (10)	0-2	3	4-10
	Close to average not clinically significant	Slightly low may be clinically significant	Low substantial risk of clinically significant problems
Prosocial behaviour score (Total 10)	6-10	5	0-4
Impact score (Total 10)	0	1	2-10

Self rated SDQ			
	Average unlikely to be clinically significant	Slightly raised may reflect clinically significant problems	This score is high substantial risk of clinically significant problems
Total difficulties score (Total 40)	0-15	16-19	17-40
Emotional symptoms score (10)	0-5	6	5-10
Conduct problems score (10)	0-3	4	4-10
Hyperactivity score (10)	0-5	6	7-10
Peer problem score (10)	0-3	4-5	4-10
	Close to average clinically significant problems unlikely	Score is slightly low may reflect clinically significant problems	Score is low there is a substantial risk of clinically significant problems
Prosocial behaviour score (Total 10)	6-10	5	0-4
Impact score (Total 10)	0	1	2-10

Please note that the SDQ has been amended for use in Australia and that Victorian clinicians should not download the SDQ versions from Goodman's website. Goodman who owns the copyright for the SDQ has also developed translated SDQ. These translations are inconsistent with the version mandated by NOCC. In particular, the question that seeks an overall opinion, and the perception of other informants (teachers and or parents) opinions on the young person's behaviour are the major difference e.g. PC1 questions 36, 37 and 38. The differences are significant with the Parent SDQ covering 4-16yrs where NOCC versions cover 4-10 and 11 -17yrs

Broad classification based information from www.sdqinfo.com © R. Goodman,
quoted in ACAHOCH Strengths and Difficulties Questionnaire Training Manual, April 2005
Impact score not in original citation