

**PREDICTORS OF DEPRESSION AMONG PRIVATE
SECONDARY SCHOOL STUDENTS IN ZARIA,
NORTHWEST NIGERIA**

ARE AMOS OLORUNFEMI

MB; BS (ABU)

MATRICULATION NUMBER- 189222

**A PROJECT SUBMITTED TO THE CENTRE FOR CHILD AND ADOLESCENT
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THE DEGREE OF MASTER OF SCIENCE IN CHILD AND ADOLESCENT
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DECLARATION

I hereby declare that this thesis is my original work and that it has not been submitted in part or in whole to any other institution for a degree or diploma.

Where other sources of information have been used, the authors were duly acknowledged and listed in the references.

ARE, Amos Olorunfemi

Signature

Date

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CERTIFICATION BY SUPERVISOR

I certify that this work was carried out by Dr Amos Are of the Centre for Child and Adolescent Mental Health, University of Ibadan, under my supervision.

Supervisor (Signature and Date)

Dr Tolulope Bella- Awusah

MBBS (Ibadan), Msc CAMH (Ibadan), FWACP

Department of Psychiatry,

College of Medicine,

University of Ibadan

DEDICATION

To 'my reasons',

Gladys, Jayson and Janelle.

*You are my constants in this equation of unending variables that life
is.*

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I am most grateful to my God, Jehovah the giver of life and the preserver of it.

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KEY TO ABBREVIATIONS (ACRONYMS)

ANOVA	Analysis of Variance
BDI	Beck Depression Inventory
CES-D	Centre for Epidemiological Studies- Depression Scale
CES-DC	Centre for Epidemiological Studies- Depression Scale for Children
CDI	Children's Depression Inventory
DSM- 5	Diagnostic and Statistical Manual, 5 th edition.
HAM-D	Hamilton Rating Scale for Depression
JSS	Junior Secondary School
LGA	Local Government Area
MFQ	Mood and Feelings Questionnaire
NDHS	Nigerian Demographic and Health Survey
NPC	National Populations Commission
SMFQ	Short Mood and Feelings Questionnaire
SPSS- 20	Statistical Package for the Social Sciences, Version 20
SSS	Senior Secondary School
WHO	World Health Organization

ABSTRACT

Background: Depression is one of the commonest mental health conditions affecting young people worldwide and is associated with a large illness burden. In the year 2000, depression was ranked as the 4th leading cause of disease burden globally as determined by Disability Adjusted Life Years (DALYs). It is projected that by the year 2020, it will become the 2nd most burdensome condition after cardiovascular diseases. The reported prevalence of clinically significant depression is 2% to 20 % among adolescents. There are a number of factors that are known to be predictors of adolescent depression like large family size, adolescent drinking, peer problems, poor self esteem, being a female and depression in parents. The specific objectives were to determine the prevalence of depression among school adolescents, to determine the predictors of depression among this group and to assess the relationship between depression and one risk factor (cyberbullying) and one protective factor (religiosity).

Methodology: A cross-sectional descriptive study of 350 adolescents selected from two secondary schools in Zaria, Northwest Nigeria, through a multi-stage random sampling was carried out. First a Local Government Area (L.G.A) was randomly selected out of the four in the city. Then 2 private schools were selected from a list of 20 in the LGA. The actual selection of participants was by simple random sampling. Data was analysed using the Statistical Package for Social Sciences, version 20 (SPSS 20). Differences in Sociodemographic characteristics between those depressed and those not depressed were examined using the Chi square test. Multiple regression analysis was performed to determine the independent predictors of depression. The level of significance was set at 5% for all statistics.

Results: The point prevalence of clinically significant depressions was 18.3%. The factors that were found to be independent predictors of depressive symptoms among school adolescents were coming from a polygamous family ($p=0.029$, $AOR=2.38$), and high level of father's education ($p=0.017$, $AOR=0.32$). Cyberbullying via the mobile phone was significantly associated with depression ($p=0.040$) but was not an independent predictor.

Conclusion: A high prevalence rate of depression was found among the school adolescents, to warrant appropriate school- based intervention programmes. The finding that polygamous family type is an independent predictor of depressive symptoms has particular relevance to Northern Nigeria where the practice of polygamy is rampant.

Key words: Depression; Adolescents, Predictors; Northwest Nigeria.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Depression is a major health problem, and has been recognised worldwide as an important cause of disease burden (Lopez *et al.*, 2006). Depressive disorders are now considered as a public health priority (Alize *et al.*, 2013). Depression is one of the commonest mental disorders afflicting youth worldwide (Thaper *et al.*, 2012), as it frequently starts during adolescence and can run a chronic course into adulthood (Birmaher *et al.*, 1996). It is associated with poor academic and psychosocial outcomes and predicts an increased risk for substance abuse and suicide (Birhamer *et al.*, 1996). About one third of young people with depression attempt suicide (Rey *et al.*, 2012). It is thus an important contributor to both morbidity and mortality among adolescents. Depression in childhood and adolescence is often associated with interpersonal and psychosocial difficulties which may well persist beyond the duration of the depressive episode (Birhamer *et al.*, 1998, Weissman *et al.*, 1999).

The life time prevalence of depression during early and mid- adolescence is about 5% and rises sharply to 20% during late adolescence (Thaper *et al.*, 2012). There is some evidence that the prevalence may be higher in developing countries (Thaper *et al.*, 2012). Studies done in Nigeria have reported prevalence rates of 6.9% among adolescents (Adewuya *et al.*, 2007), 5.7% to 21% among adolescent students (Adewuya *et al.*, 2006, Adeniyi *et al.*, 2011, Fatiregun *et al.*, 2014) and 12% among youths in rural communities (Omigbodun *et al.*, 2008). Notably, all the studies cited above were carried out in South west Nigeria.

Some factors have been found to be associated with depression in Nigeria. A study carried out on a sample of university students found significant association between depression and

factors like accommodation problem, very large family size, female gender, heavy cigarette smoking, and high level of alcohol consumption (Adewuya *et al.*, 2006). However, among secondary school adolescents in South west Nigeria, the factors that were found to be significantly associated with depressive symptoms were presence of depressive symptoms in the parents, poor family functioning (as determined by adolescents), peer problems, low self-esteem, drinking problems, female gender and large family size (Adewuya *et al.*, 2006). It is also a known fact that being a victim of bullying is associated with negative consequences, both in the short- term and long- term (Kochenderfer *et al.*, 1996). This negative consequences include depression. Bullying can be broadly divided into two types; traditional bullying (physical or verbal harassment, exclusion, relational aggression) and cyber bullying which is bullying through technology or electronic means like internet and mobile phone (Perren *et al.*, 2010). Cyber bullying is a risk factor for depressive symptoms in adolescents. Being a victim of cyber bullying might be even more strongly linked with depressive symptoms than traditional bullying (Perren *et al.*, 2010).

Some factors are also thought to be protective against depression. The existing evidence indicate that engagement in religious activities or religiosity may serve as a protective factor against depression (Ronneberg *et al.*, 2014), even though a study carried out in Nigeria found that religiosity did not contribute to the psychological wellbeing of adolescents. The authors however noted that the finding is inconsistent with previous studies (Adeyemo *et al.*, 2008).

There are a number of neuropsychological screening tools for depression. In Nigeria, the Beck Depression Inventory (BDI) has been used in several studies as a screening instrument for depression in adolescents (Adewuya *et al.*, 2006, Bella- Awusah *et al.*, 2015). The BDI has also been validated in Nigeria (Adewuya *et al.*, 2007). However, the BDI has a question (item 21) that may not be appropriate in some Nigerian cultures. The Short Mood and Feelings Questionnaire (SMFQ) is another instrument that has been successfully used as a

measure of depressive symptoms among Nigerian adolescents (Bella-Awusah *et al.*, 2015), and validated in many parts of the world including developing countries like Pakistan (Imran *et al.*, 2014) but not in Nigeria.

1.2 JUSTIFICATION FOR THE STUDY

Depression is one of the commonest mental health conditions affecting young people. Nigeria has a significant youthful population, with up to 45% of the population below the age of 15 years (Nigerian Demographic Profile, 2013). Considering the high prevalence rates of adolescent depression cited earlier, this suggests a large illness burden. However, almost all the studies have come from the Southern part of the country. The demographic profile of the Northern population is different from the South (Mancini; 2009), hence the need to determine the prevalence rate and correlates of depression in that part of the country. Even though the common correlates of adolescent depression in Nigeria are known, there is need to explore other predictors that may be protective such as religiosity, or risk factors like cyber-bullying which is a more recent development in this technology age.

1.3 AIMS

To identify the prevalence and predictors of depression among secondary school adolescents in Zaria, Nigeria.

1.4 SPECIFIC OBJECTIVES

1. To identify the prevalence of depression among secondary school adolescents in Zaria, Nigeria
2. To determine the socio demographic correlates of depression among secondary school adolescents in Zaria, Nigeria.

3. To assess the relationship between depression and one hypothesized protective factor (religiosity) and one hypothesized newer risk factor (cyber bullying) among secondary school adolescents in Zaria, Nigeria.

1.5 NULL HYPOTHESIS

1. Religiosity will predict low depressive symptoms
2. Experience of cyber bullying will predict higher depressive symptoms.

1.6 OUTCOME MEASURES

The outcome measure will be depression as measured by BDI and SMFQ.

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CHAPTER TWO

LITERATURE REVIEW

2.1 WHAT IS DEPRESSION?

“Depression is a common mental disorder, characterised by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, feelings of tiredness and poor concentration”(WHO 2015). The Diagnostic and Statistical Manual of Mental disorders (DSM -5) requires that the symptoms must have lasted for at least 2 weeks duration. The symptoms must not be better accounted for by another mental disorder or a general medical condition. In addition, there must be impairment in some aspects of functioning (DSM-5[2013]).

2.2 DEMOGRAPHIC CORRELATES OF DEPRESSION

Gender

In most countries and cultures of the world, depression is known to occur twice as often in women (especially those of child bearing age) as in men. There are a number of hypothesis to explain this observation. These include hormonal influence, effects of child birth, differing psychosexual stressors for both sexes, and behavioural models of learned helplessness (Sadock & Sadock, 2007). Furthermore, the burden of depression is 50% higher in females than males. Thus, while depression is the 4th leading cause of disease burden in females, it is only the 7th for males (Usten *et al.*, 2004)

Age

The average age of onset of depressive disorders is about 40 years (Sadock & Sadock; 2007). It can also have its' onset in the extreme of ages. Recent evidence suggests that the incidence

of major depressive disorders may be on the rise among people younger than 20 years of age (Sadock & Sadock, 2007). Among children and young people, the prevalence of depression rises significantly during adolescence (Thaper *et al.*, 2012).

Marital status

There is a higher rate of depression in people without close interpersonal relationships or in those who are divorced or separated (Sadock & Sadock, 2007). In relation to children, depression and emotional difficulties are more common in those living in single parent or reconstituted families (Meltzer *et al.*, 2000) and those in polygamous families (Al-Sharfia *et al.*, 2015).

2.3 DEPRESSION AS A PUBLIC HEALTH PRIORITY

Depression has deservedly earned its place as a public health issue due to its' high prevalence rate (up to 15%), and the enormous burden associated with it (Usten *et al.*, 2004). In the year 2000, depression was ranked as the 4th leading cause of disease burden, accounting for 4.4% of the total Disability adjusted life years (DALYs). Depression is also said to be responsible for about 12% of total years lived with disability worldwide. It is the most important cause of non- fatal burden (Usten *et al.*, 2004). It is also an indirect cause of mortalities, in form of suicides. It is projected that by the year 2020, depression will be 2nd only to cardiovascular disease as a leading cause of disability worldwide (Muray and Lopez; 1996). All of these provide conclusive evidence that depression is a major public health problem that affects individuals and societies (Usten *et al.*, 2004)

The burden associated with depressive disorders can be divided into categories based on its effects on functioning, quality of life, loss of productivity and the economic implication of its treatment (Simon *et al.*, 2003). The severity of functional impairment and reduced well being

suffered by people with depression is comparable to or even sometimes greater than that of patients with chronic medical conditions like diabetes, hypertension and cardiovascular diseases (Hays *et al.*, 1995, Spitzer *et al.*, 1995). The relationship between depression and loss of productivity at work is also well documented (Simon *et al.*, 2003). The decreased productivity comes from unemployment, or absenteeism from work due to illness. Considering health service costs, there is evidence that depression causes up to 50- 75% increase in overall health service cost (Simon, VanKorff, and Barlow, 1995; Henk *et al.*, 1996). This observed increase in health service cost results more from an increased demand on general health services and not psychiatric services. The burden of depression is even more pronounced in children and adolescents as it is associated with dropping out of school, poor academic performance, risk of teenage pregnancy and marital problems in adult life. All these combine to reduce the quality of life and decreased economic productivity (Kessler *et al.*, 1999).

2.4 DEPRESSION IN CHILDHOOD AND ADOLESCENCE

2.4.1 The Global picture

The prevalence rate of depression among children and adolescents varies, depending on the geographical location, period under review, the informants and the diagnostic criteria used. Depression appears to be uncommon in children younger than 6 years. About 2% of elementary school- aged children experience depression (Birhamer *et al.*, 1998). Generally, it has been estimated that about 1% to 2% of pre- pubertal children and about 5% of adolescents suffer from clinically significant depressive symptoms at some point (Costello *et al.*, 2003). When the life time prevalence is considered, the rate goes even higher. At about the age of 16 years, about 7% of boys have experienced at least one episode of depression. A life time prevalence rate of 12% is found among girls of the same age (Costello *et al.*, 2003).

At the end of adolescence, the life time prevalence rate further rises to 25%. An estimated 5% to 10% of young people are said to have minor depression. Youths with sub syndromal depression have been found to have impairment in functioning, increased risk of suicide and of developing major depression (Rey *et al.*, 2012).

2.4.2 Depression in Children and Adolescents in Africa

There are no sufficient epidemiological data on childhood and adolescent depression from Africa as a whole. There are small studies from different parts of the continent that has been reported in literatures. In the East African country of Kenya, a school- based study reported a prevalence rate of 24.6% for adolescent depression (Khasakhala *et al.*, 2012). A similar study carried out in Cape Town, South Africa reported rates of 13%, 12% and 10% for mild, moderate and severe levels of depression respectively. A higher rate of depression was found among Blacks, as compared to Whites and Coloureds (Fernander *et al.*,2006). A study conducted among adolescent students in Egypt found that of the males, 16% in Junior high school and 17.5% in Senior high school had depression. Among the female population, 13% of those in Junior high school and 15% in Senior high school had depression (Soliman *et al.*, 2012).

2.4.3 Depression in Children and Adolescents in Nigeria

A study carried out among 1095 Nigerian adolescents found major depressive disorders in 6.9% of participants (male=5.5% and female=8.9%) (Adewuya *et al.*, 2007). Another study conducted among in-school adolescents in South West Nigeria found a prevalence rate of 21.2% for depressive symptoms (Fatiregun and Kumapayi; 2014). Among youths residing in

rural areas, a prevalence rate of 12% was reported for significant depressive symptoms (Omigbodun *et al.*, 2008).

2.4.4 Aetiology and risk factors for Depression in Adolescents

The aetiology of adolescent depression is believed to arise from a complex interaction between a number of factors (Thaper *et al.*, 2012). These factors can be biological or psychosocial. Important biological factors include heredity and prenatal factors. The interplay between genetic factors, early life adversity and proximal factors like hormonal and maturational changes is believed to bring about depression (Hariri *et al.*, 2005; Thaper *et al.* 2012). The evidence from research over the years has implicated a number of factors in the onset, maintenance and recurrence of depression. However, this has to be interpreted with caution, as it can be confusing or can lead to false expectations. For instance, one may wrongly assume that the resolution of a triggering factor will automatically result in resolution of the depressive symptoms (Rey *et al.*, 2012). Parental depression is the most replicated risk factor for adolescent depression (Rey *et al.*, 2012). However, both genetic and environmental factors are thought to contribute to the 3 to 4 fold increase in risk of depression experienced by children of depressed parents (Rice *et al.*, 2002, Tully *et al.*, 2008).

Psychosocial factors have also been demonstrated to contribute to the aetiology of depression. Experiencing loss events have been associated with children developing depression. This is especially the case when children process the loss using negative attribution styles. Another important factor is lack of care or parental rejection (Rey *et al.*, 2012). Among Nigerian adolescents, a strong relationship has been found between traumatic events and onset of depression (Omigbodun *et al.*, 2008). It is more likely that stressful

events are associated with first episode of depression than for recurrence and this is more often seen in females (Parker *et al.*, 2010).

Cyber bullying is now emerging as a risk factor for depression, especially in adolescents. Cyber bullying can in broad terms be regarded as bullying using technology, such as the internet and mobile phones (Smith *et al.*, 2008, Li Q *et al.*, 2006). It has emerged as a relatively new form of bullying, with implications for the psychological wellbeing of exposed children and adolescents.

The relationship between cyber bullying and depression is not the same as traditional forms of bullying (Wang *et al.*, 2011). It was found among adolescents in the U.S.A that cyber victims reported higher depression than bullies or bully- victims. Such is not the relationship observed with other forms of bullying (Wang *et al.*, 2011). A study among Swiss and Australian adolescents concluded that cyber bullying is an additional risk factor for depressive symptoms in adolescents (Perren *et al.*, 2010).

In Nigeria, the frequency of traditional bullying in secondary schools have been decreasing, partly due to punishments meted out to bullies (Oyewusi *et al.*, 2014). However, as increasing number of adolescents are owning mobile phones and having more access to the internet, cyber bullying is becoming rampant (Oyewusi *et al.*, 2014). Even though a number of students might be aware of the term “cyberbullying”, not many of them have that awareness to recognize it when they are having the experience (Oyewusi *et al.*, 2014).

2.4.5 Protective factors

Some factors have been identified as protective in young people against depression. A number of adolescents are known to have both biological and environmental vulnerabilities to depression and yet do not develop the disorder (Brennan *et al.*, 2003). Factors that have been

shown to contribute to resilience in adolescents include emotional regulation skills, high intelligence, coping mechanisms and thinking styles (Brennan *et al.*, 2003). Also found to be protective factors were family and peer connections, high self-esteem and problem solving strategies (Denny *et al.*, 2004, Dumont *et al.*, 1999). For adolescents and young adults with childhood vulnerabilities to major depression, factors that have been found to be protective were family cohesion, positive self-appraisal and good interpersonal relations (Carbonell *et al.*, 2002). The most consistent finding has been the protective role of good interpersonal relationships. Even when such adolescents have a high genetic loading, they are still more likely to enjoy better mental health (Silk *et al.*, 2007). It is difficult to find any Nigerian study specifically examining protective factors against adolescent depression.

Religiosity has been considered as a possible protective factor against depression. There are broadly two aspects of religiosity. The first is Non-organisational religiosity (consisting of prayers and religious and spiritual beliefs), while the other is Organisational religiosity, which basically involves participation in religious services and other activities (Strawbridge *et al.*, 1998). Non-organisational religiosity has not been found to have association with depression, while organisational religiosity has a negative relationship with depression (i.e. the more religious individuals have lower rates of depression) (Strawbridge *et al.*, 1998). A meta-analysis found that two-third of the studies done on relationship between religiosity and depression reported lower rates of depression and/ or anxiety among those that are more religious (Hackney *et al.*, 2003). A study conducted among young adults found higher levels of depression among the moderately religious than among either very religious or non-religious respondents. Further analysis revealed that the relationship applies only to females (Eliassen *et al.*, 2005). Among children and adolescents of Islamic background in Saudi-Arabia, it was found that the more religious persons were happier, healthier and less depressed (Abdel- Khalek; 2009). In Nigeria, a study done among school adolescents in the

South- western part of the country reported that the contribution of religiosity to psychological wellbeing was insignificant (Adeyemo *et al.*, 2008). This finding however is at variance to most of the other studies.

2.4.6 Comorbidity

Comorbidity refers to the simultaneous occurrence of two or more illnesses in one individual. It is quite common in child and adolescent mental health practice. This is the case in childhood and adolescent depression, which has been found to be highly comorbid with other psychiatric conditions (Rey *et al.*, 2012). Comorbidity is associated with increased functional impairment. It is also linked with poor outcome in adulthood. For instance, adolescent depression comorbid with conduct disorder or substance use disorder is associated with violent offending in early adulthood (Copeland *et al.*, 2007).

2.5 SCREENING MEASURES FOR DEPRESSIVE SYMPTOMS IN CHILDREN AND ADOLESCENTS

Screening tools are not used to diagnose depression but they can give an indication about the severity of the symptoms (Sharp *et al.*, 2002). There are a number of screening measures for depressive symptoms for use in children and adolescents. The choice of which tool to use depends on several considerations like; the characteristics of the population in question, the psychometric properties of the instrument, time factor, ease of use, and the cost of obtaining the instrument (Sharp *et al.*, 2002). All the measures have statistically determined cut- off score at which an individual is regarded as having significant depressive symptoms. Many of these tools are also capable of categorizing scores into different degrees of severity (Sharp *et al.*, 2002). However, for a definitive diagnosis to be made, the individuals that have been

screened as positive will then be interviewed following standard diagnostic criteria like those set forth in the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5).

Screening measures are useful in detecting depression during a research process. They are also relevant in clinical settings, for example in monitoring patient's response to treatment (Feinmann *et al.*, 2000). These measures also have important limitations, and diagnostic tools are still required. For instance, some conditions share common symptoms with depression. Also, screening measures do not consider some important diagnostic features like duration of symptoms, degree of impairment and co- morbid conditions (Sharp *et al.*, 2002). Generally, depressive screening measures are useful in children that are at least 7 years old with few exceptions (Sharp *et al.*, 2002)

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Table 2.1: Screening Measures for Depression in Children and Adolescents

Measures	Age appropriateness	Number of items	Time to complete(Mins)
Children's Depression Inventory(CDI)*	7 to 17 years	27	10 to 15
Centre for Epidemiological Studies-Depression Scale for Children(CES-DC)**	12 to 18 years	20	5 to 10
Centre for Epidemiological Studies-Depression Scale (CES-D)***	14 years & older		5 to 10
Reynolds Child Depression Scale****	8 to 12 years	30	10 to 15
Reynolds Adolescent Depression Scale*****	13 to 18 years	30	10 to 15
Beck Depression Inventory(BDI)*****	14 years & older	21	5 to 10
Mood and Feelings Questionnaire(MFQ)*****		33	10 to 15
Short Mood and Feelings Questionnaire (SMFQ)*****	7 to 18 years	13	5 or less

Keys; Mins=Minutes.

*= (Kovacs; 1992)

**=(Fredrich *et al.*, 1990) Radloff;1977)

****= (Reynolds; 1989)

*****=(Reynolds; 1986)

*****=(Beck; 1961)

*****=(Angold *et al.*, 1995)

Beck Depression Inventory (BDI)

The BDI is a 21- item self- rated questionnaire which asks about depressive symptoms in the past 2 weeks. It is designed for use in individuals that are 13 years and older (Beck *et al.*, 1996). It is rated on a 4- point likert type scale, from 0-3 depending on the severity of each item, thus the maximum score obtainable is 63. The BDI was revised in 1996 to be more in tune with the DSM IV diagnostic criteria for depression. The changes include the new timeframe of 2 weeks for symptoms instead of the 1 week previously required. The BDI-II is in popular use as a screening tool for depression, but not as a diagnostic tool (Beck *et al.*, 1996). Numerous studies provide evidence for the BDI's reliability and validity across different populations and cultural groups. It has also been used in several treatment outcome studies and studies involving individuals exposed to trauma (Beck *et al.*, 1996). The BDI has been shown to demonstrate acceptable test- retest reliability and internal consistency (Beck *et al.*, 1996). This finding has been replicated in numerous studies including adults, and adolescents with similar findings.

A meta- analysis of the BDI's internal consistency estimates yielded a mean coefficient alpha of 0.86 for psychiatric patients and 0.81 for non- psychiatric patients. The concurrent validity of the BDI with regard to clinical ratings and the Hamilton Rating Scale for Depression (HAM-D) were also high. The BDI-II scores are correlated with scores on Reynolds Adolescent Depression Scale, the Beck Hopelessness Scale and Beck Anxiety Inventory. The BDI scores can discriminate between adolescents who do and do not meet DSM IV diagnostic criteria for major depressive disorder (Krefetz *et al.*, 2002, Kumar *et al.*, 2002). Accumulated evidence also shows that the BDI can discriminate between subtypes of depression and can also differentiate anxiety from depression (Beck *et al.*, 1998). Steer *et al.* (1998) examined the psychometrics of the BDI-II among adolescent out- patients and found good internal consistency. They found no differences between Caucasians and non-

Caucasians but reported significant correlation between age and BDI scores. The BDI has also been demonstrated to be valid in detecting significant depressive symptoms in a sample of Nigerian school adolescents (Adewuya *et al.*, 2007).

The Short Mood and Feelings Questionnaire (SMFQ)

In community settings, screening for depressive symptoms presents a challenge due to limited access to mental health professionals and the considerable costs and time involved in administering comprehensive assessments such as a structured or semi-structured diagnostic interview (Kataoka *et al.*, 2002, Lahey *et al.*, 1996). The SMFQ provides solution to a number of these concerns. The SMFQ is an abbreviated 13- item version of the Mood and Feelings Questionnaire (MFQ). It was developed as a brief instrument to evaluate core depressive symptomatology in epidemiological studies of children between the ages of 8 and 18 years (Angold *et al.*, 1995). The informant rate each statement as 2(true), 1(sometimes true) or 0 (not true) over the previous 2 weeks. This will yield a maximum score of 26. Any score above 10 is suggestive of depressive disorder. The developers of the SMFQ have reported that the tool has good internal reliability (Angold *et al.*, 1995). The SMFQ takes 5 minutes or less to complete and can be easily scored on the spot. There are parallel versions for parent and child (Angold *et al.*, 1995).The 13- items of the MFQ that comprise the SMFQ focus on affective and cognitive symptoms, including one item inquiring about low mood (“I feel miserable or unhappy”) and one item addressing anhedonia (“I didn’t enjoy anything at all”) (Angold *et al.*, 1995).

The SMFQ has been used in studies among Nigerian adolescents (Bella- Awusah *et al.*, 2015, Ola *et al.*; 2015), and shows good psychometric properties though further validation is required.

CHAPTER THREE

METHODOLOGY

3.1 STUDY LOCATION

The study was carried out in Zaria, a city in the North western geopolitical zone of Nigeria. The city has an estimated population of 847,000 people (National Population Commission, 2012). The predominant language spoken is Hausa. Zaria is mainly an agricultural town dealing in cotton and millet, although is also home to a number of Educational institutions like the Ahmadu Bello University, School of Aviation Technology, Federal College of Education and two Polytechnics. In addition, there are numerous primary and secondary schools, both public and private (National Population Commission, 2012). The city is made up of four local government areas (L.G.As), namely: Giwa, Sabon Gari, Zaria, and Soba.

One LGA was randomly selected, which was Sabon Gari LGA, which has about 60 schools. Most of these schools are co- educational, and majority of the attendees are day students. The student population in each of these schools range between five hundred to two thousand. The schools consist of three junior and three senior secondary classes. Each school was headed by a principal that had two Vice principals assisting him. There were a number of teachers handling various subjects. Two schools were selected for the study (details of sampling method is provided below)

3.2 STUDY DESIGN

The study was a cross-sectional descriptive study on the predictors of depressive symptoms among secondary school students in Zaria.

3.3 STUDY POPULATION

The study population consist of adolescents attending private secondary schools in Zaria.

3.3.1 Inclusion Criteria

Students between the ages of 14 to18 years who provided assent and whose parents or legal guardians gave consent.

3.3.2 Exclusion Criteria

1. Students identified by their teachers as having learning difficulties
2. Students who have been treated for a psychiatric disorder in the past. This information was obtained from the socio- demographic questionnaire.

3.4 SAMPLE SIZE

The sample size was calculated using the formula for estimating single proportion (Kirkwood and Sterne, 2010):

$$n = \frac{Z^2 Pq}{d^2}$$

where;

n= minimum sample size

Z= standard normal deviate corresponding to 5% level of significance=1.96

P= prevalence of depression among school adolescents= 21% (Fatiregun & Kumapayi, 2014)

Q= 1-P=79%

d= level of precision= 5%

$$n = \frac{1.96^2 \times 21 \times 79}{25} = 255$$

Assuming a 20% non- response rate or incomplete data, this was adjusted thus;

$$\frac{246}{(100-20)\%} = \frac{255}{0.8} = 319$$

This was approximated to **350**

3.5 SAMPLING TECHNIQUE

The sampling method used for this study was multi-stage random sampling. At the first stage, each of the four L.G.As was designated as a cluster, of which one was randomly selected by balloting. This was done by writing the names on pieces of paper, folding them, mixing them up and picking one. The L.G.A selected was the largest of the four and hosts a number of higher institutions. Next, a list of all the 20 private schools in the selected L.G.A was obtained from the State Ministry of Education. Out of this number, two were randomly picked. The selected schools were co-educational and comprised of over 1000 students each, spread across the 6 classes. The third stage consisted of actual selection of study participants. They were selected using simple random sampling technique. This was done by compiling the names of all students in SS1 to SS3 from the class register in each school and assigning a number to each one. The numbered list formed the sampling frame, which was entered into SPSS. Subsequently, the random sample module in the software was used to select the desired number of students from each school.

3.6 STUDY INSTRUMENTS

Two instruments were used for this study. These were (1) Socio- demographic questionnaire
(2) Beck Depression Inventory

3.6.1 Socio- demographic Questionnaire

This consisted of questions relating to the socio- demographic characteristics adapted from a questionnaire used in previous study on adolescents in rural and urban Ibadan (Omigbodun *et al.*, 2008). It contained items such as age, gender, religion, family background of respondents, educational level and occupation of both parents. There were questions on school- related characteristics, like having failed exams, difficulty with teachers, having a Guidance counsellor in school and if the participants would be willing to see them with their difficulties. There were also questions on whether the participant had a physical disability, or had a best friend.

In addition, appropriately framed questions were included to obtain information on other characteristics of interest, such as experience of cyber bullying and religiosity, which were the hypothesized predictor variables. The items assessing religiosity were five in number. Each of the items had four possible responses, scored on a likert scale of 0 to 3. Cyber bullying was assessed on two items, each with five options. The first item addressed bullying via the social media, while the second item dealt with bullying through the mobile phone. The items were scored on a likert scale of 0 to 4. A score of 0 means no exposure to cyber bullying in the past two months and a score of 4 represents several exposure to cyber bullying in a week. Scores of 1 to 3 represent intermediate degrees of exposure to cyber bullying. The socio- demographic questionnaire thus had a total of 39 items. The questionnaire takes about 10 minutes or less to complete (Appendix 3).

3.6.2 Beck Depression Inventory (BDI)

The BDI is a 21- item self- rated questionnaire that asks about depressive symptoms in the previous two weeks. It is designed for use among individuals aged 13 years and older (Beck *et al.*, 1996). Each item is rated 0-3 giving a maximum score of 63. Scores of 0-13 indicate minimal depression, 14-19 is mild depression, 20-28 is moderate depression and 29-63 is indicative of severe depression (Beck *et al.*, 1996). The questionnaire has been validated among school adolescents in South west Nigeria (Adewuya *et al.*, 2007). A cut- off score of 18 and above suggests clinically significant depressive symptoms (Adewuya *et al.*, 2007). The questionnaire takes about 10 minutes to complete (Appendix 4). A Cronbach's alpha of 0.92 was calculated for BDI in this study.

3.7 ETHICAL CONSIDERATION

Ethical approval was obtained from the Ethical Review Committee of the Kaduna State Ministry of Health. An official permission was also obtained from the Kaduna State Ministry of Education. A Letter of introduction addressed to the respective schools was collected from the Kaduna State Board for private schools. Permission was also obtained from the Proprietors Principals of the participating schools. One consent and one assent form were provided for each participant, one to be filled by the student and the other by the parent or legal guardian. Only those giving assent and consent were included in the study.

All data obtained from participants during the study were treated with utmost confidentiality. Only the Researcher and assistant had access to the record containing the names of the participants and the identification numbers assigned to them.

3.8 STUDY PROCEDURE

The authorities of the two selected schools were approached for permission to carry out the study in their respective schools. The Socio demographic questionnaire, BDI and SMFQ were administered to selected students in the schools. The school teachers provided assistance in identifying the selected students. All questionnaires were self- administered but the researcher and another trained assistant were on hand to give the participants any needed help in completing the questionnaires. The duration of data collection was about a week.

3.9 DATA ANALYSIS

The collected data were cleaned, coded and entered into a computer. Data analysis was carried out using the Statistical Package for the Social Sciences version 20 (SPSS 20). Data were presented using charts, graphs and frequency tables. Differences in sociodemographic characteristics between those depressed and those not depressed were examined using the Chi

square test. Logistic regression analysis was performed on all statistically significant variables to determine the independent predictors of depression. The level of significance was set at 5% for all statistics.

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CHAPTER FOUR

RESULTS

4.1 Socio-demographic characteristics of the participants

A total of 350 students participated in the study. They were drawn from two private secondary schools in Zaria. About 40% of the participants were from GHIS, while the other 60% were from DLGS. There was a slight male preponderance (51.7%) in the sample. The mean age of the respondents was 16.1 years. Half of the participants were SSS1 students (50.9%), while the remaining number were almost evenly distributed between SSS2 (21.4%) and SSS3 (25.7%) classes. Majority (63.6%) of the participants were from monogamous homes while 36.4% were from polygamous families. Most (78.6%) of the participants were Muslims, while Christians made up 19.4% of the sample. The remaining 2% either belong to traditional religious groups or did not have any religious affiliation. A sizeable proportion of the students (35.1%) engaged in some form of employment before or after school. (Table 4.1)

Table 4.1: Socio-demographic characteristics of the participants. N= 350

Variable	Frequency	Percentage (%)
Gender		
Male	181	51.7
Female	169	48.3
Class		
SSS 1	178	50.9
SSS 2	75	21.4
SSS 3	90	25.7
Religion		
Islam	268	78.6
Christianity	66	19.4
Others	7	2.0
Current living status		
Both parents	263	76.0
Single parent	56	16.2
Grandparents, Uncles, Aunts and other relatives	27	7.8
Family type		
Monogamy	210	63.6
Polygamy	120	36.4
Working to earn money?		
Yes	119	35.1
No	220	64.9

4.2 Socio-demographic characteristics of the participants' parents

Majority of the student's parents were reported to be married (87.2%), while 2.4% were either divorced or separated and another 10.4% had lost one or both parents in death. Majority of the students' fathers had tertiary level of education (68.6%), while just over half of their mothers (55%) had tertiary level of education (Table 4.2). The average number of children born to participants' mothers was 6.6, while participant's fathers had an average of 7 children.

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Table 4.2: Socio-demographic characteristics of participants' parents. N= 350

Variable	Frequency	Percentage (%)
Parents' marital status		
Married	293	87.2
Separated/ Divorced	8	2.4
One or both parents dead	35	10.4
Highest Educational level of fathers		
No formal education	13	3.8
Koranic education	21	6.2
Primary education	5	1.5
Secondary education	35	10.4
Tertiary education	232	68.6
Don't know	32	9.5
Highest Educational level of mother		
No formal education	10	3.0
Koranic education	35	10.3
Primary education	4	1.2
Secondary education	75	22.2
Tertiary education	186	55.0
Don't know	28	8.3

4.3 School- related characteristics of participants

About a quarter (26.7%) of the students reported that they had failed at least one examination in school. A minority of the students (15.9%) also reported that they were having difficulties with their teachers. The difficulty mostly cited by the students was that the teachers did not understand them well enough. Some others question the academic competence of the teachers. However, almost a quarter of the students (24.5%) said they would not go to a school Guidance counsellor if they were having difficulties. Up to 79.3% of the students reported having a close friend in school (Table 4.3)

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Table 4.3: School- related characteristics of the participants. N= 350

Characteristics	Frequency	Percentage (%)
Ever failed an exam		
Yes	92	26.7
No	253	73.3
Having difficulties with teachers		
Yes	54	15.9
No	286	84.1
Having a best friend in school		
Yes	268	79.3
No	70	20.7
Going to school counsellor		
Yes	247	75.5
No	80	24.5

4.4 Prevalence of depression

A point prevalence rate of 18.3% was found for significant depressive symptoms, using a BDI score of 18 and above as cut-off.

4.5 Associations between depression and sociodemographic variables

Chi square analysis of association was performed on the socio demographic characteristics using presence/absence of depression (defined as BDI score ≥ 18). Results showed that depression was significantly higher among children from polygamous families, children who had ever failed their exams, and children who had difficulty with their teachers ($p < 0.05$). Although depressive symptoms was higher among male children and those who work to earn money, the association was not statistically significant (Table 4.4).

Further analysis with other socio-demographic variables also showed that depression was significantly associated with parents' marital status (higher among those whose parents are divorced, separated or deceased than those whose parents are currently married) and who children currently lived with (highest among those presently living with people other than their parents). There was a significant association between depression and parents' level of education as those whose fathers had tertiary level of education were least likely to be depressed (Table 4.4). Furthermore, a significant association was found between an individual's place of worship and depression. Those claiming to be Muslims or Christians were less likely to be depressed as compared to those of other religious affiliations like traditional religion or Hinduism (Table 4.4)

Table 4.4: Association between depression and Sociodemographic variables

Variable	Depression		Total	Chi square	P value
	Yes	No			
Gender					
Male	35(19.4)	145(80.6)	180	0.30	0.581
Female	29(17.2)	140(82.8)	169		
Family type					
Monogamous	31(14.8)	179(85.2)	210	4.54	0.033*
Polygamous	29(24.2)	91(75.8)	120		
Work to earn money					
Yes	23(19.6)	96(80.7)	119	0.47	0.492
No	36(16.4)	184(83.6)	220		
Have a best friend					
Yes	45(16.8)	223(83.2)	268	0.40	0.529
No	14(20.0)	56(80.0)	70		
Ever failed exam					
Yes	24(26.1)	68(73.9)	92	6.09	0.014*
No	37(14.6)	216(85.4)	253		
Have difficulty with teachers					
Yes	16(29.6)	38(70.4)	54	5.96	0.015*
No	45(15.7)	241(84.3)	286		

***Significant at 5%**

Table 4.4(cont): Association between depression and Sociodemographic variables

Variable	Depression			Chi square	P value
	Yes	No	Total		
Parents marital status					
Married	45(15.4)	248(84.6)	293	9.75	0.002*
Others	15(34.9)	28(65.1)	43		
Who presently lives with					
Both parents	35(13.3)	228(86.7)	263	18.74	<0.001*
Single parent	21(37.5)	35(62.5)	56		
Others	6(22.2)	21(77.8)	27		
Level of father's education					
Primary and below				9.63	0.022*
Secondary	13(33.3)	26(66.7)	39		
Tertiary	11(23.4)	36(76.6)	47		
Don't know	31(14.1)	189(85.9)	220		
	5(15.6)	27(84.4)	32		
Level of mother's education					
Primary and below				0.39	0.943
Secondary	10(21.3)	37(78.7)	47		
Tertiary	18(17.1)	87(82.9)	105		
Don't know	28(17.9)	128(82.1)	156		
	5(17.9)	23(82.1)	28		
Place of worship					
Islam	53(19.8)	215(80.2)	268	10.18	0.006*
Christianity	5(7.6)	61(92.4)	66		
None	6(40.0)	6(60.0)	15		

***Significant at 5%**

4.6: Associations between depression and hypothesized predictor variables

The result shows that those attending religious services most frequently were less likely to be depressed, even though the association was not found to be significant. None of the other variables assessing different aspects of religiosity had any significant association with depression (Table 4.5). Frequent bullying on mobile phone was also significantly associated with depression among the participants. Frequency of bullying via the social media had no significant association with depression (Table 4.5).

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Table 4.5: Association between depression and hypothesized predictor variables

Variable	Depression		Total	Chi square	P value
	Yes	No			
How often do you say prayers					
Not at all/occasionally/often	18(14.5)	106(85.5)	124	1.08	0.300
Very often	40(19.0)	171(81.0)	211		
How often do you attend religious service					
Less than once/1-2 times weekly				1.90	0.168
3 or more times weekly	25(22.7)	85(77.3)	110		
	38(16.5)	192(83.5)	230		
How important do you consider religion					
Just a little/much				0.001	0.989
Very much	4(18.2)	18(81.8)	22		
	58(18.1)	263(18.1)	311		
Do you attend special youth activities					
Less than once/1-2 times weekly	30(18.1)	136(81.9)	166	0.006	0.939
3 or more times weekly	32(18.4)	142(81.6)	74		
Does your religion guide your behaviour					
Not at all/little/much				0.002	0.962
Very much	5(18.5)	22(81.5)	27		
	57(18.2)	257(81.8)	314		
Bullied on social media					
No	29(14.5)	171(85.5)	200	2.79	0.248
1-3 times monthly	10(23.8)	32(76.2)	42		
Once/several times weekly	14(20.3)	55(79.7)	69		
Bullied on mobile phone					
No	30(13.5)	192(86.5)	222	6.46	0.040*
1-3 times monthly	11(26.2)	31(73.8)	42		
Once/several times weekly	11(25.0)	33(75.0)	44		

***Significant at 5%**

4.7 Predictors of depression

Table 4.6 shows the odds ratios and confidence intervals from multiple logistic regression of depression on variables. Adolescents from polygamous homes were 2.38 times more likely than those from monogamous homes to have depression (95% CI = 1.09 – 5.16). Respondents who had fathers with tertiary education were about three times less likely to have depression compared to those with primary education and below (OR= 0.32, 95% CI = 0.12 – 0.82). Other variables were not significant at 5%, though the higher odds among those bullied most frequently compared to those not bullied achieved borderline significance. Similarly those that live with other people apart from their parents were more likely to be depressed, at a p value of 0.053

Table 4.6: Multiple logistic regression of depression on variables

Variable	Odds ratio (OR)	95% CI OR	P value
Family type			
Monogamous(ref)	1		
Polygamous	2.38	1.09 – 5.16	0.029
Ever failed exam			
Yes	1.16	0.50 – 2.67	0.733
No (ref)	1		
Have difficulty with teachers			
Yes	2.29	0.92 – 5.73	0.076
No(ref)	1		
Parents marital status			
Married(ref)	1		
Others	1.12	0.31 – 3.99	0.864
Who presently lives with			
Both parents (ref)	1		
Single parent	2.26	0.67 – 7.65	0.191
Others	3.27	0.99 – 10.83	0.053
Level of father's education			
Primary and below(ref)	1		
Secondary	0.73	0.22 – 2.44	0.612
Tertiary	0.32	0.12 – 0.82	0.017*
Don't know	0.58	0.15 – 2.28	0.442
Place of worship			
Islam(ref)	1		
Christianity	0.32	0.08 – 1.26	0.103
Others	3.38	0.75 – 15.23	0.114
Bullied on mobile phone			
No(ref)	1		
1-3 times monthly	1.71	0.65 – 4.51	0.276
Once/several times weekly	2.59	1.00 – 6.70	0.050

***Significant at 5%**

CHAPTER FIVE

DISCUSSION

5.1 Socio -demographic characteristics

The mean age of participants in this study was 16.1 (SD=2.17) years. This is similar to the mean age obtained in an earlier study carried out among secondary school students in Zaria (Akpobi- Madu, 2014). Other studies from different parts of the country have reported mean ages from 15.3 years to 16.9 years for secondary school adolescents (Omigbodun *et al.*, 2008, Abdulmalik, 2009, Oshodi *et al.*, 2010, Audu, 2013). More males (51.7%) were represented in the study than females in the sample and this reflects the gender ratio in the schools. This is similar to the earlier finding in Zaria showing a slight male preponderance (51.9%) (Akpobi- Madu, 2014). Studies conducted in the South western part of Nigeria also reflected a similar pattern (Abiodun, 1993, Gureje *et al.*, 1994). One explanation for this is the fact that school enrolment rate for girls is generally lower than for boys in Nigeria (Nmadu *et al.*, 2010). Majority of the study participants (63.6%) came from monogamous families, even though the prevalence of polygamous family type (36.4%) is still considerable. This may be due to the predominant Islamic background of the students (78.6% were from Muslims). This finding was similar to that from an earlier study in Zaria showing that 70.1% of the students were Muslims (Akpobi- Madu; 2014). A contrasting picture is seen in southern part of Nigeria where a predominantly Christian population had been reported (Omigbodun *et al.*, 2008, Bella- Awusah *et al.*, 2015). Most of the participants' parents were married (87.2%) and is similar to earlier finding of 89.7% in a comparable population in Zaria (Akpobi- Madu; 2014) and other parts of Nigeria (Bella- Awusah *et al.*, 2015). A high proportion of students had parents with post- secondary level of education (i.e 68.6% of fathers and 55% of the

mothers). This is higher than other studies in Zaria reporting between 32.5% to 45.4% for fathers and 17.5% to 47.9% for mothers (Audu, 2013, Akpobi- Madu, 2014). The finding of a high proportion of participants' parents with tertiary level of education could be explained by the fact that the study was carried out in Sabon gari LGA in Zaria, which is home to a number of tertiary educational institutions like Ahmadu Bello University, School of Aviation Technology, Nigerian Institute of Transport Technology and a Federal College of Education. This provides adequate opportunity for higher education. Furthermore, the sample was drawn from private fee- paying schools which might exclude children of the less educated and economically disadvantaged parents. The average number of children born to participants' mothers was 6.61, which was almost the same with the general fertility rate in North- western Nigeria as a whole (6.7 births/ Woman). This zone has the highest fertility rate in Nigeria (NDHS, 2013).

5.2 Prevalence of depression

The point prevalence of clinically significant depression in this study was 18.3%. This falls within the range of 5% to 50% prevalence that has been reported from various developed and developing countries of the world for significant depression using rating scales (Fleming *et al.*, 1989, Abou- Nazel *et al.*, 1991). More conservative estimates of 5% to 20% have been reported in more recent literature (Rey *et al.*, 2012). Though the prevalence found in the current study was higher than most of the earlier estimates in Nigeria, it is comparable to the one used in estimating the sample size for this study (Fatiregun & Kumapayi, 2014). A prevalence of 12.9% was reported in a study carried out in the North east (Abdulmalik, 2009), between 6 to 12% in the South west (Adewuya *et al.*, 2007, Omigbodun *et al.*, 2008, Adeniyi *et al.*, 2011, Bella- Awusah *et al.*, 2015), and 5.2% in the Northwest (Akpobi- Madu, 2014). The study in the Northwest used a diagnostic assessment rather than the screening tool (Beck Depression Inventory) deployed in this study. It is also known that the estimated

prevalence of depression vary widely depending on the age of participants, methodology utilised, and the type of prevalence estimated, whether point prevalence or life-time prevalence. The high prevalence in this study may be in part related to the fact that a questionnaire was used for identification rather than a structured clinical interview. The former is well known to generate higher estimates than the latter. Future studies may help to identify other reasons for the relatively high rate of depression found in this study.

5.3.1 Socio-demographic correlates of depression

The following socio demographic variables were found to have a significant relationship with depression as determined by BDI score of 18 and above: being from a polygamous family, having parents who are separated, divorced or bereaved, living with people other than one's biological parents, father's level of education and place of worship. Of the aforementioned factors, two emerged as independent predictors of depression using BDI score. These were being from a polygamous family and father's level of education.

In the study conducted by Adewuya *et al* (2006), the factors that were found to be predictors of adolescent depression were parental depression, gender, adolescent drinking, problem with peers, adolescent-rated family functioning, adolescent self esteem and number of children in family. Most of these factors were not assessed for in this study.

Most of the studies on factors associated with depression in adolescents have come from western countries (Adewuya *et al.*, 2006), where the identified predictor factor in this study (monogamous/ polygamous family type) would be a rare occurrence. There is a general paucity of literature on factors predicting adolescent depression in Africa (Adewuya *et al.*, 2006), where 20% to 50% of all marriages are polygamous (Caldwell & Caldwell, 1993). A systematic review found more mental health problems in children and adolescents from polygamous than monogamous families (Al-sharfi *et al.*, 2015). It is possible that this

association is due to other factors associated with depression that are more likely to be seen in polygamous families, like large family size (Reinherz *et al.*, 2000)

This study found that adolescents not living with their parents were more likely to be depressed than those living with both parents. In a study carried out among adolescents in South west Nigeria, 'not living with parents' was a significant predictor of depression (Fatiregun *et al.*, 2014).

This study found that adolescents belonging to minority religious groups like traditional religion and Hinduism were significantly more likely to be depressed than those professing either the Christian or Muslim faith. The Nigerian Demographic Health Survey of 2008 found that 98% of Nigerian population are either Christians or Muslims. The stigma and feelings of isolation associated with membership of a minority religious group may be associated with depression.

Adolescents whose fathers had tertiary level of education were found in this study to be less likely to be depressed. This also emerged as an independent predictor after controlling for other significant variables. This is not surprising because higher levels of education usually corresponds with better jobs and higher income. Depression is known to be associated with poverty (Goodman *et al.*; 2003). Some studies in the southern part of Nigeria have found association between depression and mother's level of education. However, in a polygamous setting and where mothers are less likely to work, income comes solely from the father and his level of education may determine income and thus association with depression.

Surprisingly, this study did not find a significant association between gender and depression. It is a well known fact that females are twice as likely to have depression as their male counterparts, although this is more seen in women of child bearing age (Sadock & Sadock, 2007). The female preponderance seen with depression has been reported in earlier studies

done among Nigerian secondary school adolescents (Adewuya *et al.*, 2006), even though there are studies on adolescent depression from other parts of the world where gender differences were not seen (Leadbeater *et al.*, 1995).

5.3.2 School- related correlates of depression

Adolescents' having difficulties with teacher' had a significant relationship with depression. A bidirectional relationship is a possible, in which adolescents' having difficulties with teachers may predispose to depression and depressed youths may be more likely to report difficulties with teachers (may be due to declining performance in school or difficulty with concentration). The exact nature of the relationship requires further evaluation. The study by Adewuya *et al* (2006), found an association between adolescents' having 'school problems' and depression but was not a significant independent predictor. The current study also found that adolescents who had ever failed an examination in school were more likely to be depressed than those who have never failed. This finding may be related to the fact that academically poor students are more likely to suffer from low self esteem and may not be as popular among friends as their more brilliant counterparts. Some of them may in fact be repeating classes, with its attendant feelings of shame and humiliation.

5.4 Depression and hypothesized risk factor: Cyber bullying

Frequent bullying on the mobile phone was found to be significantly associated with depression in this study. This is in keeping with the research hypothesis that cyber bullying is a risk factor for depressive symptoms. This finding is collaborated by earlier studies (Perren *et al.*, 2010).

This study however did not find cyber bullying as an independent predictor on multiple regression analysis. A plausible reason for this is the likelihood of under reporting of cyber bullying by the adolescents. While Nigerian school adolescents may be aware of the term “cyber -bullying”, they may not readily recognise it when they are experiencing it (Oyewusi *et al.*, 2014). It is not surprising for a relatively new risk factor like cyber bullying. The general consciousness of it may still be low especially in a developing country like Nigeria. The lack of significant association between depression bullying via the social media in this study may also be due to the fact that relatively few youths have access to social media in this part of the world. Indeed, up to 64% of respondents reported no exposure to online bullying in the past two months.

5.5 Depression and hypothesized protective factor: Religiosity

Adolescents who reported frequent attendance at religious services were less likely to be depressed, but the association was not significant. Various studies have also established the fact that religiosity was protective against depression.. For example, a meta- analysis found that religious people have lower rates of depression (Hackney *et al.*, 2003). Another study among children and adolescents in Saudi Arabia found that the more religious individuals were less depressed (Abdel- Khalek, 2009). This is of note because the studied population is predominantly Muslim, like the case in Saudi Arabia. Organizational religiosity (eg attendance at services and other activities) has been reported to have a negative relationship with depression (Strawbridge *et al.*, 1998). The same association has not been found with non- organizational religiosity (eg prayers and spiritual beliefs) (Strawbridge *et al.*, 1998). It is also possible that adolescents that are depressed have lost interest in such activities or simply lack the energy to participate as actively as those that are not depressed. Findings may

also be due to the fact that religiosity is hard to measure and attendance at religious services may not truly reflect religiosity as these are young people still under their parents so if parents attend a service , it is mandatory for them to do so as well.

5.6 Limitations

This study has some limitations. These include the fact that the sample was drawn from private fee- paying schools that may have more of children from privileged background. It may thus be difficult to generalize the findings to all secondary school students in Zaria. Furthermore, all data collected in the study were through self-report and no diagnostic assessments were done. The cross- sectional design means that no causal association can be assumed.

The study had its' strengths however, which includes exploring an emerging risk factor for adolescent depression (cyber bullying), and a possible protective factor. The study also has particular relevance to the northern part of Nigeria where polygamy is widely practiced, by identifying being from a polygamous family as an independent predictor of depression in adolescents.

5.7 Conclusions

In conclusion, this study showed that almost one in five adolescents attending secondary schools in Zaria suffer from clinically significant depression. Being from a polygamous family and having fathers with lower level of education were the independent predictors of

depression in school adolescents. Cyber bullying had a significant association with depression in adolescents.

5.8 Recommendations

Based on the result of this study, the following recommendations are made;

1. There is a need for mental health literacy programmes targeting the teachers, and students to promote healthy schools. This should include training and re- training of teachers to enable them to have better relationship with the students, and being more skilled in identifying and addressing problems of adolescents.
2. Mental health programmes should be instituted in schools, targeting bullying in all its forms.
3. While there is a lot of emphasis on female education, attention should be given to the education of the boy child, especially in a region where the ‘almajiri’ practice is common. This appears to have long term effect on depression in prospective children.
4. Government should be encouraged to provide welfare packages to families with less educated fathers and support them in other ways to enhance their education and / or income.

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APPENDIX 1

INFORMED CONSENT FORM (PARENT/ GUARDIAN)

Title of Research: Predictors of depressive symptoms among secondary school students in Zaria and Validation of the Short Mood and Feelings Questionnaire (SMFQ).

This study is being conducted by Dr. Amos Are, an Msc student of The Centre for child and Adolescent Mental health, University of Ibadan. The purpose of this research is to find out the factors that are associated with depression among school adolescents and to validate a brief questionnaire used for screening young people for depression.

The research essentially involves filling of 3 questionnaires. The first ask about your child's socio demographic information like age, gender, religion, tribe etc. The other 2 inquires about symptoms of depression in your child over the past 2 weeks. Completing the 3 questionnaires will take not more than 25 minutes. The researcher will return after a week to administer the same questionnaires to 50 students who had earlier completed the questionnaires. This will exclude the questionnaire asking about socio demographic information and so will taken even less time to complete.

Your child's name or identity will not be disclosed in any reports from this study. His/ Her participation is entirely voluntary. There will be no form of punishment for those that choose not to participate in the study. You child will not be paid for His/ Her involvement in this study. Participants will be given pencils to fill the questionnaire. Your child will be free to stop participating at any time during the study.

Statement of person giving consent:

The information given me about the study is well understood. I will be willing for my child/ ward to take part in the study.

Name.....

Signature/ Thumbprint.....

Date.....

APPENDIX 2

INFORMED CONSENT FORM (ADOLESCENT)

Title of Research: Predictors of depressive symptoms among secondary school students in Zaria and Validation of the Short Mood and Feelings Questionnaire (SMFQ).

This study is being conducted by Dr. Amos Are, an Msc student of The Centre for child and Adolescent Mental health, University of Ibadan. The purpose of this research is to find out the factors that are associated with depression among school adolescents and to validate a brief questionnaire used for screening young people for depression.

The research essentially involves filling of 3 questionnaires. The first ask about your personal information like age, gender, religion, tribe etc. The other 2 inquires about symptoms of depression in over the past 2 weeks. Completing the 3 questionnaires will take not more than 25 minutes. The researcher will return after a week to administer the same questionnaires to 50 students who had earlier completed the questionnaires. This will exclude the questionnaire asking about personal information and so will taken even less time to complete.

Your name or identity will not be disclosed in any reports from this study. Your participation is entirely voluntary. There will be no form of punishment for those that choose not to participate in the study. You will not be paid for your involvement in this study. Participants will be given pencils to fill the questionnaire. You will be free to stop participating at any time during the study.

Statement of person giving assent:

This study has been well explained to me and I understand the nature and purpose of the research. I will be willing to take part in the study.

Signature/ Thumbprint of participant.....

Date.....

APPENDIX 3

SOCIODEMOGRAPHIC QUESTIONNAIRE

Please write the answers to the questions or draw a circle where it applies to you. This is not an examination it is only to find out about you and your health.

SECTION I

Personal Information

1. Name of School:

2. Class:

3. How old are you?

4. Are you a boy or a girl? (a) boy (b) girl

5. Do you practice any religion? (a) Yes (b) No

6. Please write down the exact place you attend for worship

(a) Islam (b) Orthodox Christian (c) Pentecostal Christian (d) Traditional religion (e) Other

7. How much does the teaching of your religion guide your behaviour?

(a) Very much (b) much (c) Just a little (d) Not at all

8. How often do you say prayers alone/ by yourself?

(a) Very often (b) often (c) occasionally (d) Not at all

9. How often do you attend religious services in your mosque or church?

(a) 3 or more times a week (b) 2 times a week (c) once a week (d) less than once a week

10. Overall, how important do you consider religion to be in your life?

(a) Very much (b) much (c) just a little (d) not at all

11. How often do you attend special youth services in your mosque or church?

(a) 3 or more times a week (b) 2 times a week (c) once a week (d) less than once a week

Family Information

12. Family Type:

(a) My father has one wife (b) My father has 2 wives (c) my father has 3 or more wives

13. Number of Mother's Children: _____

14. Number of Father's Children: _____

15. What is your position among your father's children? _____

16. What is your position among your mother's children? _____

17. Marital Status of Parents:

(a) Married (b) Separated/Divorced (c) Father is dead (d) Mother is dead (e) Mother & Father are dead

18. How many husbands has your mother had? _____

19. Who do you live with presently?

(a) Both Parents (b) Mother (c) Father (d) Grandparents (e) Uncle or Aunty/Grandmother (f) Grandfather (g) Other [please specify] _____

20. Who did you live with when you were growing up?

(a) Both Parents (b) Mother (c) Father (d) Grandparents (e) Uncle or Aunty/Grandmother (f) Another relative/Grandfather (g) Other [please specify] _____

21. Do you do any kind of work to earn money before or after school? (a) Yes (b) No

22. If yes, please describe what you do _____

23. Level of Father's Education

(a) No Formal Education (b) Koranic School (c) Primary School (d) Secondary School (e) Post Secondary (Non-University) (f) University Degree and above (e) I do not know

24. Occupation of Father: [Write the exact occupation] _____ / I do not know

25. Level of Mother's Education

(a) No Formal Education (b) Koranic School (c) Primary School (d) Secondary School (e) Post Secondary (Non-University) (f) University Degree and above (e) I do not know

26. Occupation of Mother: [Write in the exact occupation] _____ / I do not know

27. How many nights in the week do you go to bed still feeling hungry due to lack of food in the house?

(a) None (b) One (c) Two (d) Three (e) More than three

28. Which of the following items does your family own?

(a) Flat screen TV (b) Fridge (c) Satellite dish [e.g DSTV] (d) Motor cycle (e) car

29. Do you have a physical disability? (a) Yes (b) No

If yes, please tell us what type of disability _____

30. Do you have a best friend? (a) Yes (b) No

School-Related Questions

31. Have you ever failed an exam in your school? (a) Yes (b) No

32. Are you having difficulties with your teachers? (a) Yes (b) No

33. If Yes, what sort of difficulties? _____

34. Do you have guidance counsellors in your school? (a) Yes (b) No

35. Have you ever gone to see them? (a) Yes (b) No

36. If you have a problem at school would you go to the guidance counsellor for help?

(a) Yes (b) No

37. Have you received treatment for a mental disorder in the past? (a) Yes (b) No

If yes, specify _____

38. Have you been bullied on the internet (e.g Facebook, email, twitter etc) in the past 2 months?

(a) No, I have not been bullied on the internet in the past 2 months

(b) I have been bullied on the internet once or twice in the past 2 months

(c) I have been bullied on the internet 2 or 3 times a month

(d) I have been bullied on the internet once a week

(e) I have been bullied on the internet several times a week

39. Have you been bullied through a mobile phone (e.g bad text messages) in the past 2 months?

(a) No, I have not been bullied through a mobile phone in the past 2 months

(b) I have been bullied through a mobile phone once or twice in the past 2 months

(c) I have been bullied through a mobile phone 2 or 3 times a month

(d) I have been bullied through a mobile phone once a week

(e) I have been bullied through a mobile phone several times a week

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APPENDIX 4

BECK DEPRESSION INVENTORY

This depression inventory can be self-scored. The scoring scale is at the end of the questionnaire.

1. 0 I do not feel sad.
 1 I feel sad
 2 I am sad all the time and I can't snap out of it.
 3 I am so sad and unhappy that I can't stand it.

2. 0 I am not particularly discouraged about the future.
 1 I feel discouraged about the future.
 2 I feel I have nothing to look forward to.
 3 I feel the future is hopeless and that things cannot improve.

3. 0 I do not feel like a failure.
 1 I feel I have failed more than the average person.
 2 As I look back on my life, all I can see is a lot of failures.
 3 I feel I am a complete failure as a person.

4. 0 I get as much satisfaction out of things as I used to.
 1 I don't enjoy things the way I used to.
 2 I don't get real satisfaction out of anything anymore.
 3 I am dissatisfied or bored with everything.

5. 0 I don't feel particularly guilty
 1 I feel guilty a good part of the time.
 2 I feel quite guilty most of the time.
 3 I feel guilty all of the time.

6. 0 I don't feel I am being punished.
1 I feel I may be punished.
2 I expect to be punished.
3 I feel I am being punished.
7. 0 I don't feel disappointed in myself.
1 I am disappointed in myself.
2 I am disgusted with myself.
3 I hate myself.
8. 0 I don't feel I am any worse than anybody else.
1 I am critical of myself for my weaknesses or mistakes.
2 I blame myself all the time for my faults.
3 I blame myself for everything bad that happens.
9. 0 I don't have any thoughts of killing myself.
1 I have thoughts of killing myself, but I would not carry them out.
2 I would like to kill myself.
3 I would kill myself if I had the chance.
10. 0 I don't cry any more than usual.
1 I cry more now than I used to.
2 I cry all the time now.
3 I used to be able to cry, but now I can't cry even though I want to.
11. 0 I am no more irritated by things than I ever was.
1 I am slightly more irritated now than usual.
2 I am quite annoyed or irritated a good deal of the time.
3 I feel irritated all the time.
12. 0 I have not lost interest in other people.
1 I am less interested in other people than I used to be.
2 I have lost most of my interest in other people.
3 I have lost all of my interest in other people.

13. 0 I make decisions about as well as I ever could.
1 I put off making decisions more than I used to.
2 I have greater difficulty in making decisions more than I used to.
3 I can't make decisions at all anymore.
14. 0 I don't feel that I look any worse than I used to.
1 I am worried that I am looking old or unattractive.
2 I feel there are permanent changes in my appearance that make me look unattractive
3 I believe that I look ugly.
15. 0 I can work about as well as before.
1 It takes an extra effort to get started at doing something.
2 I have to push myself very hard to do anything.
3 I can't do any work at all.
16. 0 I can sleep as well as usual.
1 I don't sleep as well as I used to.
2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
3 I wake up several hours earlier than I used to and cannot get back to sleep.
17. 0 I don't get more tired than usual.
1 I get tired more easily than I used to.
2 I get tired from doing almost anything.
3 I am too tired to do anything.
18. 0 My appetite is no worse than usual.
1 My appetite is not as good as it used to be.
2 My appetite is much worse now.
3 I have no appetite at all anymore.
19. 0 I haven't lost much weight, if any, lately.
1 I have lost more than 2kg or a little weight

- 2 I have lost more than 4kg or some weight
3 I have lost more than 6kg or a lot of weight
20. 0 I am no more worried about my health than usual.
1 I am worried about physical problems like aches, pains, upset stomach, or constipation.
2 I am very worried about physical problems and it's hard to think of much else.
3 I am so worried about my physical problems that I cannot think of anything else.
21. 0 I have not noticed any recent change in my interest in sex.
1 I am less interested in sex than I used to be.
2 I have almost no interest in sex.
3 I have lost interest in sex completely.

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