

**PREVALENCE AND CORRELATES OF MENTAL  
DISORDERS AND NUTRITIONAL-PROBLEMS AMONG  
PRIMARY SCHOOL PUPILS IN IDO EKITI, NIGERIA**

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## DECLARATION

I hereby declare that this study is my original work under the supervision of Professor Olayinka Omigbodun, the former Director of the Centre for Child and Adolescent Mental Health, Dr. Kofoworola Adediran, of the Institute of Child Health and Dr. Kehinde Lawal of the Centre for Child and Adolescent Mental Health, in partial fulfilment of the requirement for the award of Masters of Science degree. It has not been submitted to any other institution for any award.

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CERTIFICATION

I hereby certify that this research proposal was written by Abidakun Oluwayemisi O., a postgraduate student of the Centre for Child and Adolescent Mental Health, College of Medicine, University of Ibadan and it has been reviewed and approved.

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## DEDICATION

This research work is dedicated to God almighty that made this programme possible. Secondly, I am dedicating it to my children (Anjolaoluwa and Boluwatife) and my caring parents.

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## KEY TO ACRONYMS

ADHD	-	Attention Deficit Hyperactivity Disorder
EFA	-	Education for All
PTSD	-	Post Traumatic Stress Disorder
WHO	-	World Health Organisation
DSM	-	Diagnostic and Statistical Manual of Mental Disorders
ODD	-	Oppositional Defiant Disorder
OR	-	Odd Ratio
SDQ	-	Strength and Difficulty Questionnaire
SPSS	-	Statistical Package for Social Sciences
K-SADS-PL	-	Kiddie Schedule for Affective Disorders and Schizophrenia
SDG	-	Sustainable Development Goals
CD	-	Conduct Disorder
CDC	-	Centre for Disease Control
SD	-	Standard Deviation
BMI	-	Body Mass Index
LMIC	-	Low and Middle Income countries
SFP	-	School Feeding Programme
SCD	-	Sickle Cell Disease
USA	-	United State of America
UK	-	United Kingdom
ICD	-	International Classification of Diseases
HGSFP	-	Home Grown School Feeding Program
TDS	-	Total Difficulty Score

## ABSTRACT

### **Background**

According to the World Health Organisation (W.H.O), health is “a state of complete physical, mental and social well being and not merely the absence of disease or infirmity”. The mental health of children and adolescents is important for their physical and cognitive functioning. Child mental health is defined by W.H.O “as a state of wellbeing in which the child realizes his/her own abilities, can cope with normal stresses of life and can work productively and fruitfully and is able to contribute to the community”. Mental health is fundamental to child’s ability to think logically and interact well with others. Disruption in this abilities result in mental health problems. Mental health has a direct or indirect impact on the physical health. This study aimed to determine the prevalence, pattern and correlates of mental disorders in children and adolescent sand the nutritional problems in Ido-Ekiti, Nigeria.

### **Methodology**

This descriptive cross-sectional study was carried out in selected primary schools in Ido-Ekiti Southwest Nigeria. A total of 284 school-going children between the ages of 6-12 years were randomly selected from Three (3) public and two (2) private schools in the 3 wards. The instruments used for data collection were: Socio demographic questionnaire, Strength and Difficulties Questionnaires (SDQ), the Kiddie Schedule for Affective Disorders and Schizophrenia Lifetime version (KSADS-PL). The height and weight of the participants were also recorded to assess their nutritional status.

Data was analysed using SPSS version 26. Categorical variables were described using frequencies and proportions, continuous variables were described using means. Chi–square test was used to determine associations between mental disorders and socio demographic

characteristic and nutritional status. Logistic regression was used to determine the predictors of mental health disorders. Level of significance was set at 5%.

## **Results**

A total of 284 primary school children participated in this study. The mean age of the participants was  $8.57 \pm 1.65$  years. There were 149(52.5%) males and 135(47.5%) females. The prevalence of mental disorders in the sample, based on SDQ abnormality and KSADS-PL diagnostic assessment was 20.4% and 18.8% respectively. Children aged 6-9 years had a prevalence of 7.6% of mental disorders while adolescents aged 10-12 years had a prevalence of 14.0%. The factors found to be significantly associated with DSM-V disorders were: Parent disharmony ( $p=0.001$ ,  $x^2=17.299$ ), children currently living with a single parent or other relatives ( $p=0.013$ ,  $x^2=7.917$ ), low level of maternal education ( $p=0.039$ ,  $x^2=4.282$ ), high number of mother's children ( $\geq 4$ ) ( $p=0.031$ ,  $x^2=4.627$ ) and poor academic performance ( $p=0.009$ ,  $x^2=9.520$ ) were found to be significantly associated with DSM-V disorders. Prevalence of malnutrition was 29.2%. Malnutrition is higher in public school children (35.1%) than among private school children (20.0%).

## **Conclusion**

Mental health problems and malnutrition were prevalent among school-going primary school children and adolescents. The high prevalence of DSM-V disorders found in the study substantiates the need for scaling-up the children and adolescent mental health (CAMH) services for primary schools in Ekiti State and Nigeria. The significant association of mental disorder with poor academic performance is a pointer to increase the awareness of teachers to the fact that mental disorders have negative effect on the performance of the pupils.

**Keywords:** prevalence, children and adolescents, mental disorders, correlates, malnutrition, Ido Ekiti

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## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background

Mental health of children is a state of wellbeing in which a child realizes his abilities, he can cope with normal stresses of life, he is able to work productively and fruitfully and is able to make a contribution to his community” (WHO, 2000). Mental wellbeing is of great importance in childhood, any experiences in infancy and first five years of life have been found to have a long term lasting effect on a child’s mental health (Polanczyk, Salum & Sugaya, 2015). Mental wellbeing has a wide-ranging impacts upon how the children feel, view themselves and quality of life and the wider society (Public Health England, 2015).

Studies in Nigeria reported the commonly identified mental disorders in children and adolescents living in low-resource countries as: mood disorders, anxiety, conduct disorder, oppositional defiant disorder, attention deficit and hyperactivity disorder and rarely seen is autism (Gureje *et al.*, 1994; Abiodun *et al.*, 2011; Lasebikan, 2012).

Several identifiable factors affect the development of mental problems in children and adolescents namely; food insecurity, age, sex, large family size, child labour, disjointed family structure, exposure to child abuse can be associated with mental disorder (Abdullateef, Adedokun and Omigbodun, 2017; Oderinde *et al.*, 2018; Salmanian *et al.*, 2019). Food insecurity negatively impacts the social, emotional and behavioural development of school-aged children, which interferes with learning and achieving their academic success (Murphy *et al.*, 1998; Hanks, Grafton & Emily Johnson, 2018). Nutritious diet reduces the symptoms of hyperactivity, anxiety, and depression (Murphy *et al.*, 1998; Kleinman *et al.*, 2002). Children that live in food-insecure households are disadvantaged in schools when compared with peers from food-secure households; they are seven-times more likely to engage in

physical fights in school (Kleinman *et al.*, 1998) and likely to be apathetic, non-responsive and have decreased motivation in classrooms (Ashiabi, 2005).

Nutrition is a fundamental pillar of human life; it helps to sustain growth and healthy development. The socioeconomic development of a country is significantly dependent on the adequacy of nutritious food available. Therefore, nutritional status is referred to as measurement of the extent to which accessible nutritious diet of a population group was able to meet the nutritional requirement. It is an important indicator of the children's global wellbeing. If the nutritional requirement is not met amongst school-aged children, it results to malnourished children. Malnutrition is a silent emergency which has received a public health concern because of its devastating effect on children (Flisher *et al.*, 2012). Under-nutrition is the most commonly seen form of malnutrition in low and middle income countries faced with food insecurity. The rate of under nutrition is high in Asia and Africa.

Every day, countless children across the globe turn up for school on an empty stomach which make it hard for them to focus in class. Having food at school every day will not only better their nutrition and health but it will increase access to education and achievement in education. A school-based nutrition service is needed as an intervention to alleviate hunger in school-going children.

Home-grown school feeding program is a national programme as a component of school health programme aimed to improve both the physical growth and mental health of children. The programme is funded solely by federal government and supported by state government. Provision of daily meal in primary schools reduces absenteeism, lowers behavioural problems and improves social relationships in schools.

## **1.2 Statement of the Problem**

The global burden of mental disorders is on the increase in low and middle-income countries (WHO, 2008). Mental health disorders are the leading cause of disability in children (Slomski A, 2012). Nigeria is estimated to have over eighty (80) million children and adolescents (*Nigeria Demographic Profile, 2018*) currently under the age of 15. A survey conducted in a rural community in Nigeria on 500 children aged 5-15 years reported a prevalence of 15% of mental disorders among children (Abiodun, 1993).

Nutritional status could have an effect on the mental health of children resulting from poor nutrition and poverty. Poor nutritional diet has been shown to have a negative effect on cognition and learning abilities (Chepkwony et al., 2013; Olatunya, Isinkaye, & Olatunya, 2015; Jirout et al., 2019). This is supported by a study conducted in the Northern Nigeria that reported a prevalence of mental disorders among children in a poor resource areas as 37% (Abdullateef, Adedokun & Omigbodun, 2017), which corresponds to more than a third of the sample population.

Many studies that were carried out in Nigeria such as (Falade *et al.*, 2012; Ogunsile, 2012; Taylor and Ogbogu, 2016) examined nutritional status and its effect on academic performance, but there is dearth of studies to the best of our knowledge on the prevalence of mental disorders and its association with nutrition. This research is to identify the prevalence of nutritional problems and mental disorders in children who are in low-resource settings of Ido Ekiti town in Ekiti State.

## **1.3 Justification**

The development of a society's health is evidenced in the nutritional status of the children that reside therein (Omigbodun, Adediran and Akinyemi, 2010). The prevalence of mental disorders among children in a paediatric care settings in Ilorin was 11.3% (Abiodun *et al.*,

2011). Gureje et al (1994) and Abubakar- Abdullateef et al (2018) carried out studies in South West and Northern Nigeria found a high (19.4% and 37.0% ) rate of mental disorders (O Gureje *et al.*, 1994; Abdullateef, Adedokun and Omigbodun, 2017). School health programme is an intervention to help improve mental health of children so as to enhance the promotion of health in achieving Sustainable development goals (SDG) 3 & 4. This study will add to knowledge about the prevalence and correlates of nutritional problems and mental disorders among primary schools pupils aged 6-12 years in Ido Ekiti, Ekiti State, Nigeria.

### **1.5 Research Questions**

1. What are the mental health disorders of primary school pupils in Ido Ekiti?
2. What are the correlates of mental disorders among primary school pupils in Ido Ekiti?
3. What is the nutritional status of primary school pupils in Ido Ekiti?
4. What is the relationship between the pupil's body mass index and their mental health status in Ido Ekiti?

### **1.6 Aim**

This study aims to determine the prevalence and correlates of nutritional problems and mental disorders among primary school pupils in Ido Ekiti, Ekiti State, Nigeria.

### **1.7 Specific Objectives**

The specific objectives of this study shall be to:

1. Determine the prevalence of mental disorders among primary school children in Ido Ekiti.
2. Identify the socio-demographic correlates of mental disorders among children and adolescents.

3. Determine the prevalence of malnutrition (stunting, wasting, underweight and obesity) among primary school children in Ido Ekiti.
4. Determine the association between mental disorders and body mass index (BMI) of primary school children in Ido Ekiti

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## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Definition of Health

Health is defined as a state of complete physical, mental and social wellbeing and not merely in the absence of disease or infirmity (WHO, 1948). The three important components of good health are physical, mental and social health.

#### 2.2 Mental Health of Children

Child's mental health is defined as the "state of wellbeing of a child in which he realizes his abilities, he can cope with normal stresses of life, he is able to work productively and fruitfully and he is able to make a contribution to his community"(WHO, 2000). Mental health is an important part of the overall health of children. It is more than the absence of mental illness as this was reflected in the comprehensive mental health action plan themed "No Health without Mental Health".

Mental health is connected with the physical health and behaviour. It is seen as a state of health that allows an individual to flourish fully to enjoy life. Mental wellbeing is fundamental to human ability to think, interact well with each other and the way we live our lives (Srivastava et al., 2012, Public England, 2014). It has a complex interactive relationship between the physical health and the children's ability to succeed in school and in the society. The physical and mental health of children has effect on how they think, feel and act on the inside and outside. For instance, a young boy who is overweight may be teased continuously in school by his friends over his excess weight, and this may cause him to be unhappy, lowers his self-esteem, socially withdrawn to self and be reluctant to play or exercise again, therefore affecting his physical health, social health as well as his mental health.

Ensuring good mental health in children includes:

- Being in good physical health, eating a balanced diet and getting regular exercise

- Having time and freedom to play, indoors and outdoors.
- Being part of a family that gets along well most of the time.
- Going to a school that looks after the wellbeing of all the pupils.
- Taking part in local activities for young people.

Others include:

- Feeling loved, understood, trusted, valued and safe
- Being interested in life and opportunities to enjoy themselves
- Hopeful and optimistic
- Being able to learn and having opportunities to succeed
- Accepting who they are and recognising their abilities
- Having a sense of belonging in their family, school and community
- Living in a safe and secure environment
- Having the strength to cope when something goes wrong (resilience)

Changes in any of the above mentioned factors can act as a trigger in a child that is vulnerable to developing mental problems.

### **2.3 Mental Problems of Children**

Mental problems or mental disorders in children are defined as delay or disruptions in developing age-appropriate thinking, behaviours, social skills or regulation of emotions. These problems are distressing to the child, and it disrupts the ability to function well at home, school and other social situations. However, it may be difficult to understand mental health problems in children early enough because normal childhood development is a process that involves change. More so, children may not be able to explain how they feel or why they are behaving in a certain way.

Mental disorders among children and adolescents were estimated to be about 10-20% worldwide (MH Action plan, 2013). Polanczyck et al. (2015) and Prince et al. (2007) reported

in a meta-analysis study of global prevalence of mental disorders in children and adolescents as almost 15%. In Sub-Saharan Africa, prevalence of mental disorders amongst children was estimated to be in the range of 13-20% (Gureje *et al.*, 1994; Cortina *et al.*, 2012; Flisher *et al.*, 2012; Kusi-Mensah *et al.*, 2019) while Nigeria reported a prevalence ranging between 10-20% (Gureje *et al.*, 1994; Adelekan *et al.*, 1999; Abiodun *et al.*, 2011). One in 7 children in Africa will have significant difficulties (Cortina *et al.*, 2012) but 1 out of 10 children aged 5-16 years will have a clinically diagnosed mental disorder at one point in childhood (Public Health England, 2014). 50% of all mental disorders in children emerge before the age of 14 years while 75% of all mental disorders in adults must have started before the age of 25 years (Polanczyk, Salum and Sugaya, 2015).

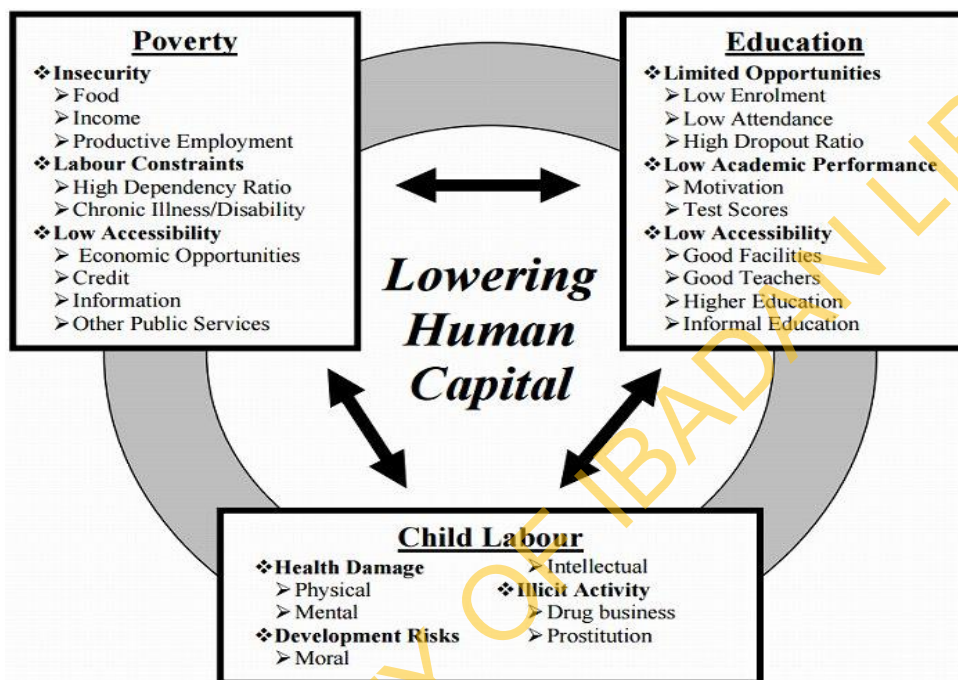
The common mental health disorders in children and adolescents were categorized by (Gould, 2016) into:

1. Behavioural disorders- examples are oppositional defiant disorder (ODD), conduct disorder (CD), attention deficit hyperactivity disorder (ADHD)
2. Developmental disorder – Autism
3. Emotional disorders- mood disorder (Depression or Mania)
4. Anxiety disorder- Generalised anxiety disorder (GAD), separation anxiety, social anxiety, post-traumatic stress disorder(PTSD), panic anxiety, specific phobia anxiety Agoraphobia and obsessive-compulsive disorder (OCD).
5. Eating disorders- Bulimia Nervosa and Anorexia Nervosa
6. Psychotic disorders- Schizophrenia
7. Substance use-related disorders

Low income countries reported commonly diagnosed mental disorders in children as; anxiety disorder; ODD/CD and depression while ADHD and autism are not commonly reported like in the high income countries (Omigbodun, 2004; Adewuya and Famuyiwa, 2007; Abiodun *et*



al., 2011). There are underlying interrelated factors that can predispose a child to developing mental illness: which includes; food insecurity, poverty, physical ill-health or chronic illness, low self-esteem, poor family structure, child abuse, child labour, discrimination, bullying, family history of mental illness, unsafe and violent environment, lack of social support and many others as shown in the diagram below.



**Figure 2:** Shows factors that influence the development of mental illness

Mental illness has a direct or indirect impact on physical health of children. For instance, mental disorder such as depression may directly lead to physical illness leading to weakening or lowering the immune system. This results from either the loss of appetite resulting in inadequate consumption of nutrients needed for survival, growth and cognitive development or increase appetite which can result into overweight. Generally, children with mental illness are more likely to engage in behaviours that can lead to their physical illness such as poor eating habit or physical inactivity.

## 2.4 Physical Health of Children

The physical health is described as the overall living condition of the body at a given time. It is when the body is functioning as designed to function. Someone who is physically healthy will be energetically fit to carry out daily activities. Physical fitness is achieved through regular moderate physical exercises, eating healthy nutritious diet, shelter and sufficient sleep in a healthy living environment. All of these are essential to maintain good physical health and healthy weight (Adrienne E Hardman, 2001). Some of the determinants of complete physical health include:

### a) Physical Activity

Physical activity is described as any bodily movement produced by skeletal muscles that requires energy expenditure. Examples of physical activities that can promote physical growth and development includes: walking, taking the stairs, swimming, dancing, jogging, skipping, playing table tennis, football, basketball, martial arts, cycling and wall climbing. The advantage of developmentally appropriate daily physical activity is that it reduces the risk of morbidity and premature mortality in children and adolescents (Lollgen, Bockenholz & Knapp, 2009).

Other benefits are better posture and balance, stronger bones, muscles and joints, learning new skills while having fun, improved attention and concentration in school. It also has a positive effect on the self-esteem, helps children to cope well with stress and improves their social interaction with friends (Healthy Families, 2013). The continued exposure of daily physical activity and the consumption of varieties of nutritious diets will determine how healthy the child's weight will be. Hence, a child with healthy weight range is less likely to develop a variety of health problems (Morawska and Mitchell, 2018). The weight is a factor of a healthy nutritious diet.

## b) Nutrition and Nutritious Diet in Children

By way of definition, nutrition is defined as the provision of materials in the form of food necessary to support the cells and organs of the body for good health and growth (Lagunju, 2018). Robinson, (1982) defined nutrition as the “science of food and nutrients, their action, interaction and balance in relation to health and disease”. Literally, nutrition is a process of taking food into the body and absorbing the nutrients in it. Nutrition is a fundamental pillar of human survival, good health and development (WHO, 2019).

Food components required by human body are from seven major classes of food namely: carbohydrate, protein, fat, minerals, vitamins, fibre, and water. The first five are energy-producing nutrients while the last two are not but they are also relevant to body growth and brain development. Summarily, the food nutrients can be classified into two;

(a) Macronutrients (energy producing and non-energy producing)

(b) Micronutrients

The energy producing macronutrients (carbohydrate, protein and fat) are needed in large quantities for energy and optimal growth while non-energy producing macronutrient is fibre (mostly contained in carbohydrate). Contrarily, micronutrients are required in relatively small amount, for example, minerals and vitamins (both can be obtained from balanced diet). A sufficient amount of all the group of nutrients are recommended for the growth and development of the body.

Childhood is a critical time in the growth and development of physical and mental abilities. It is therefore important to ensure optimal daily dietary requirements in terms of quantity, quality, timing and the nutrient component of every meal to help in the body growth and normal brain functioning (Singh and West, 2004; Grantham-McGregor *et al.*, 2007). Good nutrition is evidenced by a sufficient balanced diet and a combination of consistent physical

exercises as the cornerstone of good health. However, poor nutrition can result in low immunity which subjects the body to diseases, impaired physical and mental development (WHO, 2019).

In the early period of childhood, a sufficient amount of nutritious meals promotes the development of mental health, proper organ formation and a strong immune system. A well-nourished child will have a good mental health and therefore can learn new skills; think critically and logically (Best *et al.*, 2010). Ibekwe & Ashworth(1994) pointed out food components that help to keep the brain functioning maximally. For instance, protein found in meat, fish, and milk are used for tissues and neurotransmitters which transmits information from brain cells to another. Lack of protein in the body can lead to a form of malnutrition called protein-energy malnutrition among younger children which leads to poor school performance, lethargy, withdrawal to self, thereby affecting both the social and emotional development of the child.

Carbohydrates are commonly found in grains and fruits which are broken down to glucose from which the brain gets its energy. Fluctuations or inadequacy in level of glucose in the body can cause dizziness and confusion which affects cognitive performance. Eating a heavy carbohydrate meal enhances calmness and body relaxation because of a brain chemical that is released called serotonin. Serotonin has an effect on the mood and the person becomes happy after a carbohydrate-containing meal.

The brain is made up of about 60% fats and the fat acts as a messenger in partial control of mood in the brain. Omega-3 fatty acids obtained from food sources such as fish, walnut, fruits is good for optimal performance of the brain thereby improving memory and learning. Lack of it can lead to depression, poor memory, low I.Q, learning disability and dyslexia. Some vitamins have been identified for growth such as Vitamins A, C, E and B-complex (Ibekwe & Ashworth, 1994). Nutritional problems from inadequate food consumption or

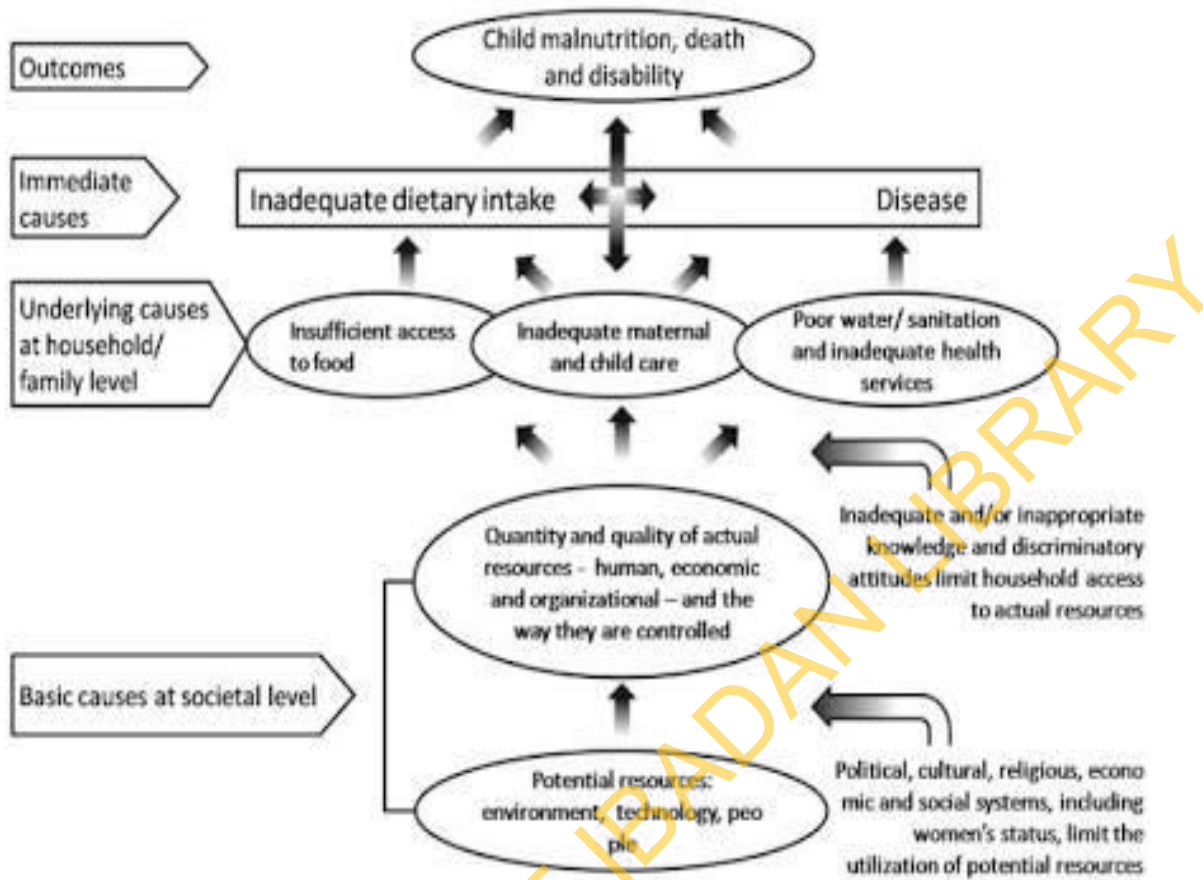
unhealthy eating habits in children constitute a major health problem in developing countries and a huge number of the children with nutritional problems live in Africa (Udani, 1979; Kurz, 1996).

## **2.5 Nutritional Problems in Children**

Nutritional status of school-going children in Africa received little or no attention in the past (Kurz, 1996). Not until recently, that attention is drawn to school-aged children and adolescent's nutrition (Omigbodun *et al.*, 2010), the focus was on under-five children because under-nutrition in this age group is linked to child mortality (UNICEF, 2009).

The challenges of accessing good nutrition which can result to malnutrition can be explained with many interrelated factors (UNICEF, 1998). Understanding the complex causative factors of the depth of the problem is important. The factors are grouped into three: underlying, immediate and basic causative factors. (1) The underlying factor is the family characteristics of the child. It includes poverty (inadequate access to food in a household), poor access to health care and unhealthy environment. The rate of poverty and low economic levels take their toll on the diet and nutritional status of children living in low and middle income countries thereby affecting their physical health as well as their mental health (Igbedioh, 1993; UNICEF, 2009). (2) Immediate causes are factors directly related to the child, most significantly inadequate dietary intake (insufficient quantity or poor quality) and infections in the child. (3) Lastly, the basic causes are problems in the larger society that affects a developing child, such as resource allocation, national policies on health care and instability of the country's economy (UNICEF, 1998).

## Causes of child malnutrition



**Figure 1:** Multifactorial causes of malnutrition (UNICEF, 1998)

Malnutrition is caused by deficiencies, excesses or imbalances in the consumption of required nutrients to human body (Ozoka, 2018). It can be grouped into two major categories: under nutrition and over nutrition (Ge and Chang, 2001). Undernutrition is inadequate consumption of required nutrients while overweight is excessive consumption of low nutrient, high fats and carbohydrates diet. Malnutrition forms are: stunting (low height for age), wasting (low weight for height), and underweight (low weight for age).

Approximately, 3.1 million children die from undernutrition each year (UNICEF, 2018a).

66 million school-age children go to school hungry across the developing countries. And about a third of them live in Sub-Sahara Africa (WFP, 2012). An estimate of 2 million children in Nigeria suffers from malnutrition but only two out of every 10 children affected have access to treatment.

Nutritional problems in children cause less energy, less interest in learning which will have an adverse effect on the academic performance and optimal cognitive development (Ge and Chang, 2001). Ardem (2003) emphasized the overwhelming effect of malnutrition on children under 10 years can be devastating on their cognitive development. Thus, good cognitive developmental functions such as: attention; memory; learning; and perception are evidences of good mental health (Igbedioh, 1993; Grantham-McGregor *et al.*, 2007; Benton, 2010; Nyaradi *et al.*, 2013; Rausch, 2013).

## **2.6 Correlates of Mental Disorders**

Attention has been shifted lately to the issues of socio-economic determinants of mental health in low and middle-income countries. Studies from developed countries have established that childhood adversities and experience of psychosocial difficulties are associated with mental and behavioural problems in children (Rutter 1999, rutter et al, 2002). Socio demographic characteristics such as gender, age, ethnicity, environment, family structure, low family income may place a child at increased risk of developing mental illness (Merikanges et al., 2009).

Studies have shown that gender is implicated in mental illness. Males are more likely to present with externalising behavioural problems, while internalizing behavioural problems are commoner with females (Hamblin, 2016). For examples, conduct disorder is one of the commonest childhood mental disorder documented to be prevalent among males than females (Gureje et al., 1994). In contrary, females are likely to get depressed and have anxiety disorder because they internalize their worries than males (Gureje *et al.*, 1994). Ethnicity has a bearing impact on children and adolescent's mental health in a diverse and complex ways shaped by discrimination, inequalities of resources, ineffective and unavailability of guiding policy and poor service responses (Malek, 2011; Lavis, 2014).

High rate of poverty causing low socioeconomic status of many families in low and middle-income countries have huge negative effect on children's nutritional status and their mental health. This put the children at difficult circumstances which rubs them of their childhood dignity. Poverty compels poor parent to send the children to work instead of school at early age, thus affecting their mental health (Jakovljevic, P and Fitzgerald, 2016). A disrupted family structure, in which the parent are either separated or divorced, may result in increased risk of exposure of the child to any form of abuse. Large family size may result in low attention, low social support and bullying from siblings.

## **2.7 Correlates of Nutritional Problems**

The nutritional problems that are common to schoolchildren aged 6-12 years are stunting (indicator of chronic under nutrition from early childhood), wasting (indicator of acute under nutrition) and underweight (combined indicator of both acute and chronic). Finding holistic solution to under nutrition among school-age children includes identifying the socio-demographic factors that are predictors to this condition (Adedeji *et al.*, 2018).

The difference in the prevalence of indices of under nutrition varies based on the socio-demographic characteristics such as: age of the child, gender, marital status of parent/caregiver, educational level of mother, family size and socio-economic class of family. Stunting has become the main indicator of childhood under nutrition (WHO, 2006). Stunting is higher in males than females in children and adolescents (Omigbodun *et al.*, 2010; Kusimansah *et al.*, 2019).

Prevalence of stunting is higher among public primary schools children possibly because of the low socio-economic status of parents and large family size of more than six members (Adedeji *et al.*, 2018). Likewise, pupils from rural areas are four times likely to be wasted than urban children and males are twice more likely to be wasted than females (Obembe, Adenuga and Asuzu, 2018). Hence, there is need for continuous intervention of nutrition



services in primary schools to improve nutritional deficiencies and problems in school-aged children.

## **2.8 Importance of School Health Programmes**

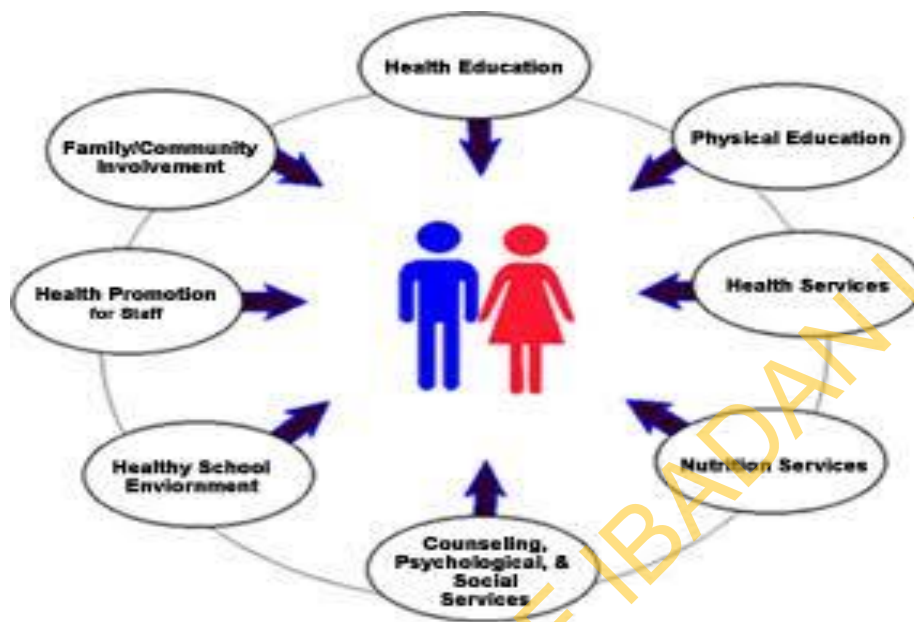
School health programmes evolved from 19<sup>th</sup> century to what is termed comprehensive school health programme (CSHP). Allensworth et al (1995) defined comprehensive school health programmes as “a set of planned, sequential, school-affiliated strategies, activities and services designed to promote the optimal physical, emotional, social and educational development of students”. The overall goal of the program is to establish a system of home, school and community collaboration to support school children to provide enabling learning and healthy environment (Allensworth *et al.*, 1995). The programme is community-based and coordinated by a multidisciplinary team. School is said to be an enabling environment in the lives of children in primary schools and this perception will have a positive influence on their mental health. However for some children, school is perceived as a place of stress and worries and this may have a negative impact on their mental health as well as their academic performance (Alokan, 2010; Williams et al., 2007; Cortina et al., 2012). Therefore, it is important to put in place effective school health services designed to improve the children’s mental health in primary schools.

The benefits of school health programmes include:

- Reduction in school absenteeism
- Reduces behavioural problems
- Encourages higher fitness level for sports and cultural activities
- Improves student academic performance
- Positive spirit and relationship between teachers and students
- Health awareness made a part of child’s life

Though, effective school health services that are design specifically within the school environment are very limited in developing countries and school mental health programme is virtually non-existence.

The 8 major components of comprehensive school health programme are listed in the figure below:



**Figure 3:** Components of School Health Programme

Nutrition services are essential component of school health programmes to tackle the menace of malnutrition among school-aged children in low-and middle-income countries. It involves

- Integration of nutrition education that models healthy food choices to mothers
- The need for comprehensive, sequential nutrition education to caregivers
- Access to child nutrition programmes like school-based nutrition programme
- Family, community and health services partnerships

In developing countries, the school-based health and nutrition services that is operational includes the provision of micronutrient supplements (vitamin A, iron and iodine), anti-helminthic for treatment of parasitic infections, safe water and other effective ways of improving the health and nutritional status of children (Beasley *et al.*, 2000; WFP, 2012). In

addition, school feeding programme as a school-based nutritional service is provided through funding by international organizations such as World Bank or United Nations World Food Programme to alleviate hunger, improves nutritional status, attention and learning of children in school.

### **2.8.1 School Feeding Programme**

School feeding programme is defined by World Bank (2016) as “targeted social safety nets that provide both educational and health benefits to most vulnerable children, thereby increasing enrolment rates, reducing absenteeism, and improving food security at household level”. The school feeding program is an intervention aimed at reducing the prevalence of under nutrition among school-aged children, it is believed that children spend more than a third of their day in school. The programme provides one meal per day in primary schools. The school feeding program is a source of meeting the needs required for body growth by ensuring the availability of a balanced diet for metabolic requirement of the body for growth and cognitive development (Zenebe et al., 2018).

Therefore, setting priority for the sustainability of the school feeding programme to continue the reduction of short-term hunger and improving the children’s cognitive function in an enhanced learning environment is sacrosanct. It is believed that the programme would increase learner's regular attendance which will improve their academic performance and reduce the hunger of pupils in classrooms (In and Ward, 2018). Furthermore, it has been suggested that the feeding programme if provided properly and effectively in schools, it will raise school enrolment and increased school attendance (Olatunya, 2015; Falade et al., 2012; Ahmed, 2004).

Historically, America was the first to launch a national school lunch program in 1946, it was initially school breakfast, then it was extended to providing snacks after-school as an educational and enrichment programme up till now (Schirm and Kirkendall, 2010). Similarly,

UK, India, and Brazil, have school feeding programme incorporated into their constitution. Brazil has the intervention domesticated as the government's zero hunger programmes. It is described as one of the largest in the world which captures over 37 million school-aged children (Yunusa, 2012; Akanbi and Alayande, 2011). A good number of countries in Sub-Saharan Africa have implemented a school feeding programme inclusive of Mali, Kenya, Ghana, Cote D'Ivoire and of course Nigeria. Nigeria's government is aware of the significance of nutritional diet on children's education and cognitive development (Yunusa, 2012). The government collaborated with international agencies for financial support for the programme's sustainability such as; New Partnership for Africa Development (NEPAD), World Food Programme (WFP), United Nations Children Fund (UNICEF) and other international development's partners to develop a universal intervention called Home Grown School Feeding and Health Programme (HGSFHP) launched on September 26<sup>th</sup>, 2005. It aimed to deliver quality meals to pupils in primary schools (Yunusa, 2012; Akanbi and Alayande, 2011). This programme was proposed in the long term to increase the income of local farmers on their agricultural products, improve education, the health and nutritional status of school-aged children (Bundy et al, 2009; Unicef, 2006). It provides a daily meal for over 9.7million pupils in 53,715 government primary schools in over 31 states. The programme was designed to provide nutritious balanced meal for 200 school days in a year, to pupils in classes 1 to 3 in public primary schools to boost enrolment, increase cognition in children and battle malnutrition.

In Ekiti state, where the study will be conducted, the home-grown SFP was commenced on the 2<sup>nd</sup> of May, 2019 for government primary schools. The programme was launched to support the federal government mission which aim to feed over 24million school children, and if achieved, it will be one of the largest school feeding programmes in Africa. The main objectives are: (1) to increase school enrolment and completion, thereby improving the 30%

drop out rate of school-age children in Nigeria (2) to improve child nutrition and health. Nigeria is known as the third-largest country with undernourished children (3) to strengthen local agricultural production and (4) to create jobs and improving both family and state economy. In addition, school feeding programme serves as an intervention that motivates a parent to register their children for quality education, ensure regular school attendance and this reduces the high rate of drop out (Chepkwony *et al.*, 2013). The programme is identified as an intervention to ensure achieving sustainable development goal three (SDG) which is “promoting education for all at all ages”. The happiness from the alleviation of short-term hunger of the pupils has a positive influence on their mental health.

#### **2.8.1.1 School Feeding Programme and Nutritional Problems**

School feeding program targets vulnerable children to save them from hunger (Zenebe, 2018). The programme provides one meal per day in government owned primary school pupils in order to improve their physical health (Falade *et al.*, 2012). Many studies have reported improvement in nutritional problems of school-aged children with school feeding programme. For example, an interventional group study in Kenya on 67 children aged 6-12 years evaluated the effect of school feeding programme on the nutritional status and anaemia of children who benefitted for at least 1 year of school daily meal. The study reported that the children were less stunted and wasted when compared with other children in control group in the same school (Neervoort *et al.*, 2012). Similarly, Zenebe *et al* (2018) conducted a school-based comparative cross-sectional study of 290 primary school students aged 10-14 in Ethiopia and assessed their nutritional status and class attendance rate. The study reported a higher prevalence of stunting among non-beneficiaries whereas body mass index (BMI) was within normal range for benefitted children.

Studies in Nigeria reported positive impact of the federal government home grown school feeding programme that is operational in public primary schools. A cross-sectional study to

assess the nutritional status of children and the analysis of the nutrient-content of meal served in Osun State on 160 children in schools benefitting from school feeding program. The study reported that the BMI of most pupils are within the 5<sup>th</sup> and 85<sup>th</sup> percentile indicating healthy growth. Underweight (13% males, 15% females) and 6% of overweight males only (Falade *et al.*, 2012). Olusanya (2010) reported a higher prevalence of underweight, stunting and wasting among public school children than those in private schools because of the differences in the socio economic status of parents. Similarly, in Ekiti State a study on 560 pupils in two public primary school settings (rural and urban) among 5-15years gave an overall prevalence of 22.8%, 6.8% and 1.9% for thinness, overweight and obesity respectively (Olatuya, 2015).

### **2.8.1.2 School Feeding Programme and Mental Health**

School feeding programme is a strategy to support the positive development and behaviour in children faced with food insecurity in low-and-middle income countries (Hanks, Grafton and Emily Johnson, 2018). Food served in primary schools to children at no cost has positive impact on their mental health. School feeding programme has been reported to have positive effect on learning ability, attentiveness, cognition and overall mental health of pupils (O'Neil *et al.*, 2014). A case-control study on over 400 school children in Iran served with 250mls of milk daily for 3 months, reported an improvement in the intelligence quotient and nutritional status of the children (Rahmani *et al.*, 2011). Kohlboeck et al (2012), in a longitudinal follow-up study on 3,361 German children aged 7-17 years on the effect of nutritional intervention programme and the influence of their lifestyle over a period of 10 years, reported a lower diet quality was associated with likelihood of emotional symptoms in children. According to Otieno (2014) report, nutrition of children improves with provision of free food in schools as well as the children's mental health.

## **2.9 Relevance of the study to CAMH**

The nutritional status of children may have an association with their mental health. Mental disorders could result from physical inactivity or physical illness in children. Many studies carried out in Ekiti State primary schools were done on the nutritional status and eating practices among school-children. There is a gap in the literature to the best of my knowledge about mental disorders association with nutritional status among children and adolescents in Ekiti State. A previous study, that was carried out in the study location assessed the prevalence and predictors of depression among secondary school adolescents in Ido- Ekiti (Oderinde *et al.*, 2018). Therefore, this study will also add to the knowledge of mental disorders seen in children and adolescents.

**Word count- 4,703**

## CHAPTER THREE

### METHODOLOGY

#### 3.1 Study Location

The study area was Ekiti State, in Southwest Nigeria. The state was created on the 1st of October, 1996. Ekiti State has a land area of 6,353km and her capital is Ado Ekiti which is a semi-urban town. Ekiti State has sixteen local government areas (LGA). The local governments are grouped into three regional areas (termed senatorial districts) namely: Ekiti Central, Ekiti South, and Ekiti North. Ekiti North senatorial district has 5 local government areas namely: Ido/Osi, Moba, Ilejemeje, Ikole and Oye. This study was carried out in Ido-Ekiti, the headquarters of Ido/Osi LGA. The inhabitants of Ido Ekiti are majorly Yorubas with a population of about 160,000 inhabitants. The major occupation of the inhabitants is subsistence farming. The town has eight (8) public schools and five (5) private schools according to Ido/Osi LGA educational authority data for 2019/2020 academic year.

The total population of pupils in public schools is 1,296 while private schools are a total of 604. Public schools are mainly funded by the government. There is free tuition and provision of free daily school-meals for classes 1-3 only. Contrarily, the private schools are funded by individuals. The environment the child lives and the socio-economic status of the parent determined the choice of school of the child (Adekoya-Sofowora *et al.*, 2006; Omigbodun *et al.*, 2010). The school feeding programme in the public schools in all the local governments in Ekiti States for the past 2 terms prior to the data collection. The daily free school lunch was given once to pupils in classes 1-3. The meal was given as 2 full spoons. Different food was given per day with an egg. However, the school pupils have not enjoyed the programme since the beginning of this term by the time of data collection due to governmental poor funding.





Figure 4: Map of Ekiti state.

### 3.2 Study Design

The study used a school-based cross-sectional descriptive survey of children and adolescents living in Ido Ekiti aimed at determining the prevalence and correlates of mental disorders and the nutritional problems among the primary school pupils.

### 3.3 Study Population

The study population were school-aged children (6 -12years) attending public and private primary schools in Ido Ekiti, Ekiti State.

#### Inclusion Criteria

- School-aged children who are between the ages of 6-12years
- Pupils who has attended at least a term in the school
- Pupils in Primary 1-6 only

#### Exclusion Criteria

- Children who refused to give assent/consent to participate.

Pupils below the age of 6years as at last birthday

- Pupils who have not spent at least a term in the school were exempted because they were unlikely to have any recent examination result which was one of the variables assessed in the study for all participants.

### 3.4 Sample Size Calculation

The computation was as follows:

$$N = \frac{(Z\alpha)^2 pq}{(d)^2}$$

$Z\alpha$  = The standard normal deviate that corresponds to 95% confidence level at 1.96

$P$  = Prevalence of mental disorders among children attending primary health care in Ibadan, Nigeria study was reported to be 19.6% (Gureje et al., 1994)

$$q = 1 - P = 0.804$$

$d$  = level of precision at 5%

$$N = \frac{(1.96)^2 \times (0.196 \times 0.804)}{(0.05)^2}$$

$$N = 242.15$$

Adding 20% adjustment for non-respondents, gives  $(242 + 48) = 290$  participants

### 3.5 Sampling Technique

A stratified multistage sampling technique was used.

The list of schools (public and private) obtained from the Area Education Officer was used to randomly select participating schools. There were 8 public schools and 5 private schools in Ido Ekiti. The total population of pupils in both groups is 1900 (public: 1,296; private: 604). Three public schools and two private schools making total of five schools were randomly selected for this study.

### Stage 1: Selection of Schools

All the public and private schools in Ido Ekiti town were written on a paper. The schools were balloted for and randomly picked. Three schools were randomly picked from the public schools and 2 private schools were also randomly selected.

**Table 1:** Population in selected schools and gender distribution

List of schools	Males	Females	Total
<b>PUBLIC SCHOOLS</b>			
SUBEB Ido Ekiti	207	178	385
Omodewa-Pilot Primary School	122	102	224
St. John's Primary School	79	73	152
<b>PRIVATE SCHOOLS</b>			
Lite House Nursery and Primary School	75	71	146
King's Pet Nursery and Primary School	57	44	101

\*\*\*\*SUBEB- State Universal Basic Education Board

### Stage 2: Selection of Pupils

The number of children selected in each primary school ( $N_c$ ) was obtained proportionally by dividing the population of pupils in selected school ( $P_s$ ) by total population of pupils in Ido ( $T_p$ ) and multiply by the sample size ( $N$ ).

This was calculated using the formula:

$$N_c = \frac{P_s}{T_p} \times N$$

Where;

$N_c$  is the number of children recruited in each school

$P_s$  is the population of pupils in the selected school

$T_p$  is the total population of pupils under survey in Ido Ekiti

$N$  is the sample size (290)

**Table 2:** Shows the total number of pupils recruited from each selected school.

Name of School	Total Population	No of Pupils Selected
SUBEB School	385	86
Omodewa Pilot School	224	50
St. John School	152	34
Lite House School	146	71
King's Pet School	101	49
		TOTAL- 290

The number of pupils selected per class ( $C_p$ ) was calculated by dividing the number of pupils in each class ( $N_p$ ) by total population of pupils in the school ( $T_p$ ) and multiply by the expected pupils to be recruited in the school ( $E_p$ ).

$$C_p = \frac{N_p \times E_p}{T_p}$$

Pupils were recruited per class by random sampling of the class register. For the classes that had two arms, an arm was randomly selected (by balloting). The first student was selected among the first 4 in the class register with a sampling interval of 4 derived by (total selected school population divided by number of pupils selected, e.g.  $385 \div 85 = 4$ ; every 4<sup>th</sup> pupil was selected thereafter). Consent form was given to selected pupils to give their parents about

2-3 days before the data collection day. Only the pupils who returned consent form participated in the research. The details of the research were explained at the level they could understand and those that volunteer were given assent form to fill. Participant's academic performance result in the last term examination was obtained from class teacher and rated in percentage.

### **3.6 Study Instruments**

The instruments include:

- The socio-demographic (school health) questionnaire by Omigbodun et al., 2008.
- The Strength and Difficulty Questionnaires (teacher-rated and self-rated versions) developed by Goodman, 1999.
- Kiddie Schedule Affective Disorders and Schizophrenia version 2016 (K-SADS PL DSM 5) (Kaufman et al., 1997)

#### **3.6.1 The Socio-Demographic Questionnaire**

This questionnaire was modified from a previous socio-demographic questionnaire designed by (Omigbodun *et al.*, 2008) that was used in a study carried out among adolescents in Southwest, Nigeria. It consists of 43 items questions divided into three sections that elicit socio-demographic characteristics of participants such as age, gender, religion, family background, size and structure of the family. Each item in the questionnaire has appropriate options to choose from. The second section of the questionnaire has additional 10 questions to assess the feeding program in public schools benefitting from Nigeria's home grown school feeding program. The third section is to record the anthropometric measurements.

#### **3.6.2 Strength and Difficulty Questionnaire (SDQ)**

The Strength and Difficulty Questionnaire is a short screening instrument developed by Goodman (Goodman, 1999). This is a short screening instrument that can be used to screen

for behavioural problems in children and adolescents. It has been used in different population samples of children and adolescents such as in paediatric general outpatient clinics and irregular school. The SDQ is noted to have good psychometric properties (Syed and Hussein, 2007; Abdullateef, Adedokun and Omigbodun, 2017; Adeniyi and Omigbodun, 2017). The SDQ has 25 item questions and 5 clinical sub-scales which address the following:

- Emotional symptoms
- Conduct problems
- Hyperactivity
- Peer problems
- Pro-social behaviour

The sum of the scores of the scales of all the items except the pro-social behaviour scale accounts for Total Difficulties Score (TDS), which ranges from 0 to 40. The SDQ has different versions which include, the parent and teacher rated versions for children aged 4 to 17 years and the self-rated version designed for children aged 11 to 17 years. The self-rated version has been adapted and used by primary school children aged 6 to 10 years in a study done in the United Kingdom (Curvis *et al.*, 2014). Similar to the study in the United Kingdom, the self-rated version was used on pupils from age 6 years and above. Each item-question was rated on a 3-point scale:

0 =not true

1 =somewhat true

2 =certainly true

However, 5 out of the 25 items were reversely coded as 2= not true, 1= somewhat true, 0= certainly true. The 5 subscales namely: emotional symptoms, conduct problem, peer problem,

hyperactivity and pro-social have 5 items per subscale which is scored on a range of 0 to 10. All except pro-social subscale items (1, 4, 9, 17 and 20) was added up to generate total difficulty score (TDS) which ranges from 0 to 40. The pro-social provides a strength score. The teachers-completed scores of 0-11 is classified as normal, 12-15 as borderline and 16-40 as abnormal while self-completed scores of 0-15 is rated normal, 16-19 as borderline and 20-40 as abnormal. Children that scored abnormal TDS of 16-40 on teacher's and 20-40 on self-rated versions met the diagnosis of probable psychiatric diagnosis on SDQ and they were furthered assessed for the purpose of specific diagnosis on diagnostic supplement of the Kiddie-SADS 2016, Present and Lifetime version-diagnostic supplements. Additional 10% of participants that had normal TDS scores were also subjected to assessment on KSADS-PL.

### **3.6.3 Kiddie Schedule for Affective Disorders and Schizophrenia (K-SADS-PL Version 2016- Diagnostic Supplement)**

The K-SADS-PL DSM 5 is a semi structured clinician-administered diagnostic interview designed to assess current and past lifetime episodes of psychiatric disorders in children and adolescents aged 6-18 years according to Diagnostic Statistical Manual of Mental Disorders (DSM-5) criteria to measure symptoms of mood, anxiety, psychotic, and disruptive behavioural disorders and neuro-developmental disorders. It was adapted from the Kiddie Schedule for Affective Disorders and Schizophrenia Lifetime (K-SADS-PL) with modifications including the removal of any references to DSM-IV, the addition of screening and supplement questions for Pervasive Developmental Disorders and revision of the Bipolar disorders section (Axelson et al., 2009). KSADS-PL is a widely used instrument (Adewuya, Ola., and Aloba, 2007). It has also been validated in paediatric children in Nigeria (Gureje *et al.*, 1994). The instrument has been used as a benchmark for validation of other screening instruments in Nigeria (Tunde-Ayinmode et al., 2012; Adeniyi & Omigbodun, 2017).

This instrument has two parts:

- The introductory and screening interview part in which the children who score above threshold on rating the primary symptoms of the DSM-Disorders.
- The diagnostic supplement part in which children who score above threshold on the screening part of the instrument are assessed on a list of symptoms probe for “diagnosis of present and severe past psychiatric episode”. The criteria for making DSM diagnosis are provided.

In this study, only the diagnostic supplements part was used by the researcher to make a diagnosis of mood disorder, anxiety disorders, oppositional defiant disorder (ODD), conduct disorder (CD), attention deficit hyperactivity disorder (ADHD) and autism spectrum disorder (ASD).

The ratings to each question are grouped as follows:

- P = Parent (information obtained from the parent)
- C = Child (information obtained from the child or adolescent being interviewed)
- S = Summary (rating the combination of information from both parent and child)

Each response to the items on the questionnaire is coded as follows:

- 0 = no information
- 1 = not present
- 2 = sub threshold level of the symptom
- 3 = threshold level of the symptom (several episodes and severe)

Rating a symptom as threshold or sub threshold depends on the items been assessed based on severity, frequency and duration of the symptom as indicated in the diagnostic supplement instrument.

Some items other than the core criteria symptoms are coded from 0 – 2, where 0 is no information, 1 is not present / No, and 2 implies the symptom is present / Yes. Summary rating of both parent and child responses was used for this research diagnostic supplement interview.



### 3.7 Study Procedure

Questionnaires were administered to pupils with the help of research assistants. Three assistants were recruited to administer the questionnaires. They were post-OND students. They were trained on how to ask each item in the questionnaire in order to get appropriate responses and how to measure the weight and height of the pupil to determine the nutritional status. A pre-test was carried out among 15 pupils in a school (Perfect Gift School) different from the selected schools in January, 2020 located in a local government different from the study location. The pre-test was done after training the research assistants a week before the study commenced. The process helped to determine how many minutes it takes to correctly administer the questionnaire which was averagely 15-20 minutes per pupil and also to ensure that the assistants understand what to be done and how to carry it out.

Firstly, the pupils that gave assent to participate were recruited and the permission of their parents/guardian having signed the consent form 2 or 3 days prior to the interview day were obtained. Eligible participants had to go through interview and questioning of the socio-demographic questionnaire by a trained research assistant.

The research assistant used the questionnaire that was already back-translated, and this ensured that participant understood the question. The interview was carried out in either the school hall or an empty classroom that is conducive to ensure confidentiality. The questionnaire has section where the participants' anthropometry parameters, the weight (Kg), height (m) and BMI ( $\text{Kg}/\text{m}^2$ ) were recorded.

After administration of the questionnaire, anthropometry measurements taken were used to assess the nutritional status of each child. The weight was measured to the nearest 0.1kg using a standardized battery powered weighing scale (CAMRY®, Model EB8575). The accuracy of the scale was checked each morning by crosschecking it with an object with a

known weight. The scale automatically adjusts to zero point after each measurement. The pupil's weight was measured in light school uniform without cardigan while standing with hands by the side, eyes straight up and without shoes (CDC, 2013).

The height measurement was in standing position using a graduated tape, affixed to the wall. The child was asked to stand up right on the floor in front of a wall. The bare heels were put together; the buttocks and shoulders were touching the fixed measuring tape. The head was positioned such that the tragus of the ear and the lowest point of the left orbit were on a horizontal plane. A ruler was placed on the crown of the head and the measurement of height was taken in centimetres and read to nearest 1.0cm. One of the trained assistants and the researcher measured all the participants to ensure correct positioning and instrument application.

The teacher-completed SDQ were filled by the class teacher to assess the difficulties and the overall mental health status of the child. The teacher's version was used because the pupils spend more than one-third of their daily hours in the school with their friends and teachers, so the teacher was able to assess their level of functioning and performance. The self-rated version that was meant for children aged 11-17 years was used by children younger than 11 years as validated in the studies done in UK and Finland on children aged 6-10 years and it reported cases of mental disorders amongst them (Koskelainen Merja, 2008; Curvis et al., 2014).

In addition, children that were screened and have above the cut-off score for normal ( $\geq 16$ ) on teacher's SDQ T<sup>4-10</sup> and  $\geq 20$  on S<sup>11-17</sup> self-rated version were further interviewed with the diagnostic supplement of the K-SADS-PL 2016 version. The phone numbers and address of participants' parents were obtained from school; the parents were contacted and visited at home to interview both the child and parent mostly after school hours and on weekends.

### 3.8 Data Management

Data were entered and analysed using the statistical package for social sciences (SPSS) Version 23. The BMI (Kg/m<sup>2</sup>) is calculated as weight (Kg) divided by height in squared meter (m<sup>2</sup>) (De Onis *et al.*, 2007). The means and standard deviations (SD) were calculated for quantitative variables such as weight, height, and BMI. The categorical variables such as sex and nutritional status were presented in frequency and percentages. This was compared with 2007 WHO/ National Centre for Health Statistics (NCHS) reference standards (De Onis *et al.*, 2007) to assess nutritional status: normal weight, underweight, stunting, wasting (thinness), overweight and obese. The WHO AnthroPlus for personal computers software version 1.0.4 (WHO, Geneva 2009) was used to generate the Z scores for weight-for-age (WAZ), height-for-age (HAZ), and BMI-for-age (BAZ) indices taking sex into consideration. The children were classified as follows;

Underweight- Low weight-for-age (WAZ < 2 SD) for children up to 10 years

Stunting- Height-for-age (HAZ < 2 SD) for children aged 5-19 years

Wasting (thinness) - BMI-for-age (BAZ score < 2 SD) for children aged 5-19 years

Normal weight- BMI-for-age (BAZ score -2 to +1) for children aged 5-19 years

Overweight- BMI-for-age (BAZ score > +1 to ≤ +2) for children aged 5-19 years

Obese- BMI-for-age (BAZ score > +2) for children aged 5-19 years

Table 2: Anthropometry indices according to age group

Anthropometry indices	Age range	Z score	Nutritional status
Weight for Age (WAZ)	5-10 YRS	-2 < WAZ < -1	Underweight
Height for Age (HAZ)	5-19 YRS	-2 < HAZ < -1	Stunting
BMI for Age (BAZ)	5-19 YRS	-2 < BAZ < -1	Thinness (wasting)
BMI for Age (BAZ)	5-19 YRS	2 < BAZ ≤ +1	Normal weight
BMI for Age (BAZ)	5-19 YRS	+1 < BAZ ≤ +2	Overweight
BMI for Age (BAZ)	5-19 YRS	+2 ≤ BAZ < +3	Obese

The values were set from the median values of the WHO international growth reference 2007 for 5-19-year-old-children (De Onis *et al.*, 2007; WHO, 2009; Cairns *et al.*, 2012).

Other variables such as: socio-demographic characteristics of respondents are presented in percentages and frequencies and also the overall prevalence of mental disorder. The association of mental disorder with selected socio-demographic characteristics are cross-tabulated using chi-square test at a significance level of 5%. The mean scores of SDQ are compared among pupils with mental health problems using the student T-test. Multivariate Linear Regression was used to test the association between nutritional status and mental health status of pupils.

### **3.9 Ethical Consideration**

Ethical approval to carry out the study was sorted from Federal Teaching Hospital, Ido Ekiti Ethics Review Committee and permission was obtained from the zonal education authority office, Ido Ekiti to allow entry to the schools.

#### **3.9.1 Right to Decline/Withdraw From Study without Loss of Benefit**

Participation in the study was completely voluntary and participants were given the assent form days before, to have the liberty to decide whether or not to participate in the research. Participants have the freewill to withdraw from the study at any point in time without threat or consequences. Detailed explanations of the purpose of the study in both English and Yoruba that is enough to give informed consent by parents was made available using consent form.

### **3.9.2 Confidentiality of Data**

Information from participants was kept confidential. No name was used in the questionnaire; each questionnaire was coded using identification codes. Participant's identity codes were kept secured. In subsequent publications that may arise from this study, no name or forms of identification will be used.

### **3.9.3 Beneficence**

Participants with significant severe emotional problems or behavioural problems were referred appropriately to mental health unit in Federal Teaching Hospital, Ido Ekiti for expert management while both the participant and the parent benefitted from psychological counselling by the researcher. Children that were malnourished were referred to the nutritionist of the paediatric unit of federal teaching hospital, Ido Ekiti.

### **3.9.4 Non Maleficence**

Participants were not exposed to any harm beyond what is been generally encountered in a normal day to day classroom environment. Also, data collection from participants did not involve any invasive process. Incentives in the form of writing materials were given to the participants.

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## CHAPTER FOUR

### RESULTS

The study was conducted at Ido Ekiti, Ekiti State in South-West Nigeria. A total of 290 participants were randomly selected for this study. Of these, 284 children completed the questionnaires correctly and 30 class teachers from all the schools selected completed the questionnaires for the 284 participants. Only the 284 children-teacher pair questionnaires which were correctly filled were selected to make a response rate of 97.9% (see figure 4.1).

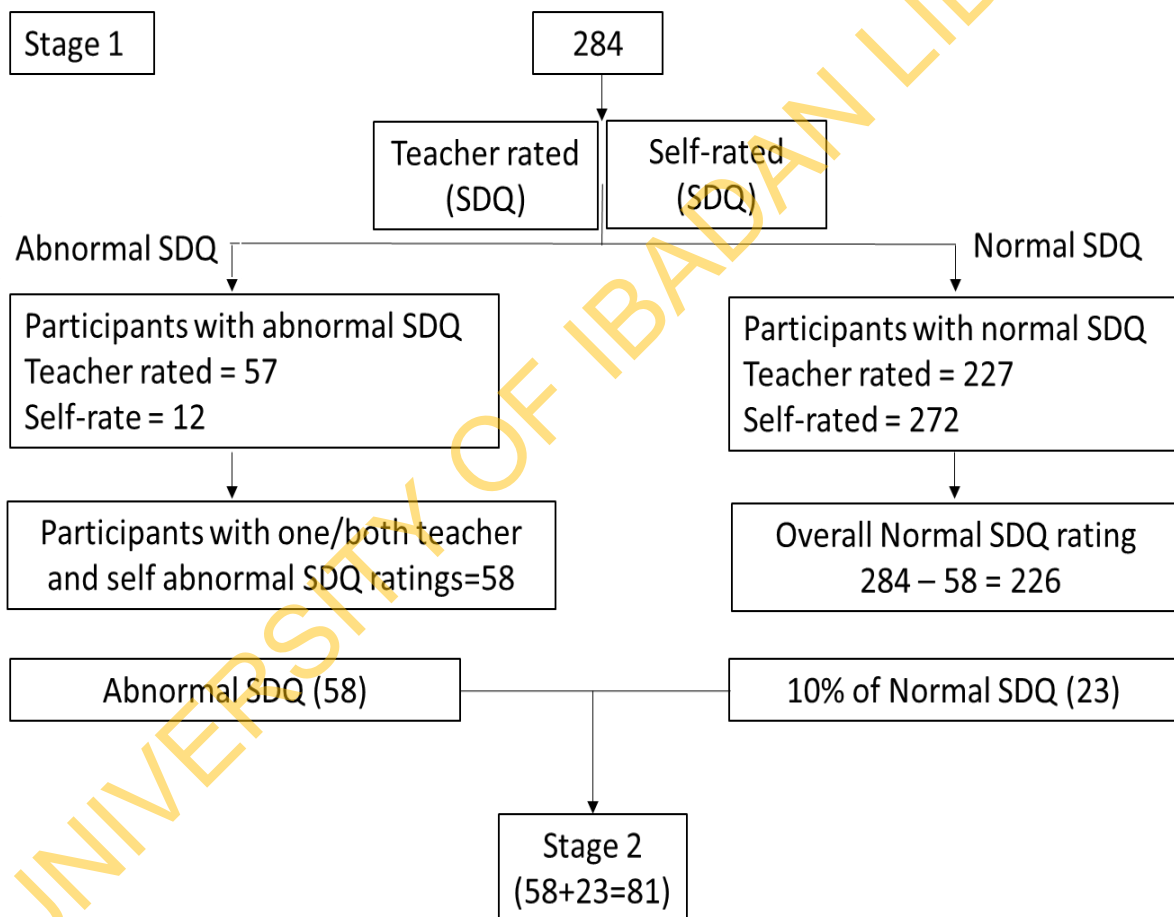


Figure 4.1: Flow-chart showing stages 1 & 2 of the study participants

## 4.1 Socio-demographic characteristics of participants

### 4.1.1 Personal information of participants

The mean age of the participants was  $8.57 \pm 1.65$  years with age range of 6-12 years. Out of the 284 participants, 149 (52.5%) were males and 135 (47.5%) females. About a third (38.7%) of the participants were from private schools while 174(61.3%) were from public schools. Majority of the pupils 198(69.7%) were within the 6-9 years group while 86(30.3%) were adolescents in the age group 10-12years (see Table4.1.1).

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**Table 4.1.1: Personal socio-demographic variables of the study participants N=284**

<b>Variable</b>	<b>Frequency (N=284)</b>	<b>Percent (%)</b>
<b>Age (years)</b>		
6 – 9	198	69.7
10 – 12	86	30.3
<b>Sex</b>		
Male	149	52.5
Female	135	47.5
<b>Type of school</b>		
Private	110	38.7
Public	174	61.3

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#### **4.1.2 Socio-demographic characteristics: Family-related information**

About a tenth (32) of the respondents were from polygamous family while 252 (88.7%) were from monogamous family type.

Two hundred and sixty (91.5%) participants had parents who were married while 24 (8.5%) had parents who were either separated/divorced or widowed parent.

Fifty-nine (20.8%) of the children reported a family size of 3-4 (which includes father, mother and children) while 225 (79.2) were from a family size of 5 or more (see Table 4.1.2a).

Two hundred and twenty-six (79.6%) fathers and 223(78.5%) mothers of the respondents attained secondary or tertiary level of education respectively, while 58 fathers and 61 mothers had no formal or less than 6 years level of education.

About a third 93 (32.7%) of the 284 participant parents were professionally employed while two-thirds 191 (67.3%) were either unskilled or semi-skilled (see Table 4.1.2b).

**Table 4.1.2a: Family Socio-demographic variables of the study participants**

<b>Variable</b>	<b>Frequency (N=284)</b>	<b>Percent (%)</b>
<b>Marital status of parents</b>		
Married	260	91.5
Separated/divorced/widowed mother	24	8.5
<b>Family type</b>		
Monogamous	252	88.7
Polygamous	32	11.3
<b>Family size</b>		
3 – 4	59	20.8
5 and above	225	79.2
<b>Number of mother's children</b>		
1-2	69	24.3
3 and above	215	75.7
<b>Who the child is currently living with</b>		
Both Parents	235	82.7
Single parent	28	9.9
Grandparent/others	21	7.4
<b>Who has been in charge of your care from your childhood</b>		
Both Parents	249	87.7
Single parent	21	7.4
Grandparent/others	14	4.9

**Table 4.1.2b: Parents' educational and occupational status**

<b>Variable</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Father's educational status</b>		
No formal/primary	58	20.4
Secondary/Tertiary	226	79.6
<b>Father's occupation</b>		
Unskilled	90	31.7
Semiskilled	101	35.6
Professional	93	32.7
<b>Mother's educational status</b>		
No formal/primary	61	21.5
Secondary/Tertiary	223	78.5
<b>Mother's occupation</b>		
Unskilled	101	35.6
Semiskilled	90	31.7
Professional	93	32.7
<b>Position among mother's children</b>		
1 <sup>st</sup>	102	35.9
Others	182	64.1
<b>Position among father's children</b>		
1 <sup>st</sup>	98	34.5
Others	186	65.5

#### **4.1.3 Socio-demographic characteristics of participants: school-related information**

Majority (88.7%) of the participants were in the lower primary classes while 32 were in the higher primary classes.

Half (143) of the pupils performed above average ( $\geq 70\%$ ) in the last term examination prior to data collection while 43.3% (123) performed averagely and 6.3% (18) pupils performed below average (see Table 4.1.3).

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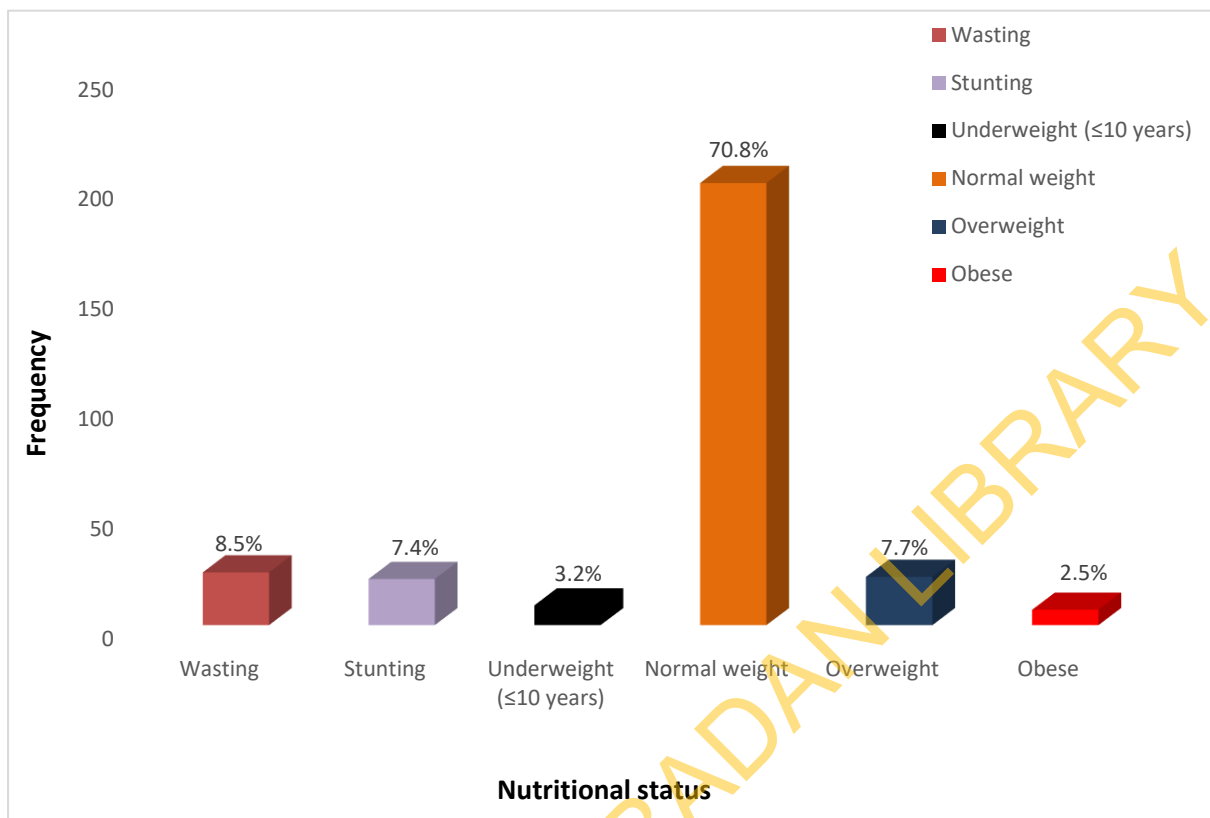
**Table 4.1.3: School and academic characteristics of the children**

<b>Variable</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Do you like your school</b>		
Yes	270	95.1
No	14	4.9
<b>What term did you start in this school</b>		
First term	240	84.5
Second term	35	12.3
Third term	9	3.2
<b>What class did start in this school</b>		
Lower primary classes (1-3)	252	88.7
Higher primary classes (4-6)	32	11.3
<b>Number in class</b>		
10 – 20	74	26.1
21 – 30	172	60.6
31 and above	38	13.4
<b>Do you do well academically</b>		
Yes	258	90.8
No	26	9.2
<b>What is the overall percentage of your last term exam</b>		
0 – 39%	18	6.3
40 – 69%	123	43.3
70 – 100%	143	50.4
<b>Are you having difficulties with your teachers</b>		
Yes	7	2.5
No	277	97.5
<b>Do you have guidance counsellors in your school</b>		
Yes	16	5.6
No	268	94.4
<b>Have you ever gone to see them</b>		
Yes	11	3.9
No	273	96.1
<b>If you have a problem at school would you go to guidance counsellor for help</b>		
Yes	112	39.4
No	172	60.6

## 4.2 Nutritional profile of participants

The mean weight, height, and BMI of the pupils were  $26.43 \pm 5.40$  kg,  $1.30 \pm 0.10$ m, and  $15.56 \pm 2.27$  Kg/m<sup>2</sup> respectively. Eighty-three respondents were malnourished giving a prevalence of 29.2% (see Figure 4.2a). Of these, nine (3.2%) respondents were underweight; 21(7.4%) stunted; 24(8.5%) wasted/thinness; 22(7.7%) overweight and 7(2.5%) were obese. The most common form of malnutrition amongst the respondents was wasting with a prevalence of 8.5% (See Figure 4.2b).

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**Figure 4.2:** Nutritional status of participants

#### 4.2.1 Gender distribution of malnourished participants

Sixteen out of the 149(8.1%) male participants were stunted compared with 5 out of 135(3.7%) female participants ( $\chi^2=5.118$ ,  $P=0.024$ ).

Twelve out of the 149(8.1%) male respondents were wasted compared with 12 out of the 135 (8.9%) female respondents ( $\chi^2=0.064$ ,  $P=0.800$ ).

Overweight was more among the 12 out of 135 (8.9%) female respondents compared with 10 out of 149 (6.7%) male respondents ( $\chi^2=0.470$ ,  $P=0.493$ ).

Five out of 149 (3.4%) males are underweight compared with 4 out of 135 (3.0%) females ( $\chi^2=0.036$ ,  $P=1.000$ ).

Five out of 149 (3.4%) male respondents were obese compared with 2 out of 135 (1.5%) female respondents ( $\chi^2=1.035$ ,  $P=0.451$ ) (See table 4.2.2).

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**Table 4.2.1: Gender difference of malnourished participants**

Variable	Sex		Total N (%)	$\chi^2$	p-value
	Male n (%)	Female n (%)			
<b>Wasting</b>					
Yes	12 (8.1)	12 (8.9)	24 (8.5)	0.064	0.800
No	137 (91.9)	123 (91.1)	260 (91.5)		
<b>Stunting</b>					
Yes	16 (10.7)	5 (3.7)	21 (7.4)	5.118	<b>0.024*</b>
No	133 (89.3)	130 (96.3)	263 (92.6)		
<b>Underweight</b>					
Yes	5 (3.4)	4 (3.0)	9 (3.2)	0.036 <sup>F</sup>	1.000
No	144 (96.6)	131 (97.0)	275 (96.8)		
<b>Overweight</b>					
Yes	10 (6.7)	12 (8.9)	22 (7.7)	0.470	0.493
No	139 (93.3)	123 (91.1)	262 (92.3)		
<b>Obese</b>					
Yes	5 (3.4)	2 (1.5)	7 (2.5)	1.035 <sup>F</sup>	0.451
No	144 (96.6)	133 (98.5)	277 (97.5)		

$\chi^2$ : Chi square test; Fisher's exact test; \*: p value <0.05

#### 4.2.2 Malnutrition based on type of school of participants

In total, 62 out of 174 (35.1%) public school attendees were malnourished compared with 22 out of the 110 (20.0%) children attending the private schools ( $\chi^2=7.387$ ,  $P=0.007$ ).

Twenty out of 174 (11.5%) participants attending public schools appeared wasted compared with 4 out of 110 (3.6%) participants attending private schools ( $\chi^2= 5.379$ ,  $P=0.020$ ).

Twenty out of 174 (11.5%) pupils attending public schools were stunted compared with one out of 110 (0.9%) pupils in private schools ( $\chi^2=11.028$ ,  $P=0.001$ ).

Nine out of 174(5.2%) participants assessed in public schools were underweight and no underweight participant among private school attendees ( $\chi^2=5.876$ ,  $P=0.014$ ).

Thirteen out of 110(11.8%) participants attending private schools were overweight compared with 9 out of 174 (5.2%) participants in public schools ( $P=0.041$ ).

Obesity is reported as 4 out of 110 (3.6%) private school attendees as compared with 3 out of 174 (1.7%) pupils attending public schools; though not significant ( $P= 0.436$ ) (see Table 4.2.2 below).

**Table 4.2.2: Nutritional status of the children based on the type of school**

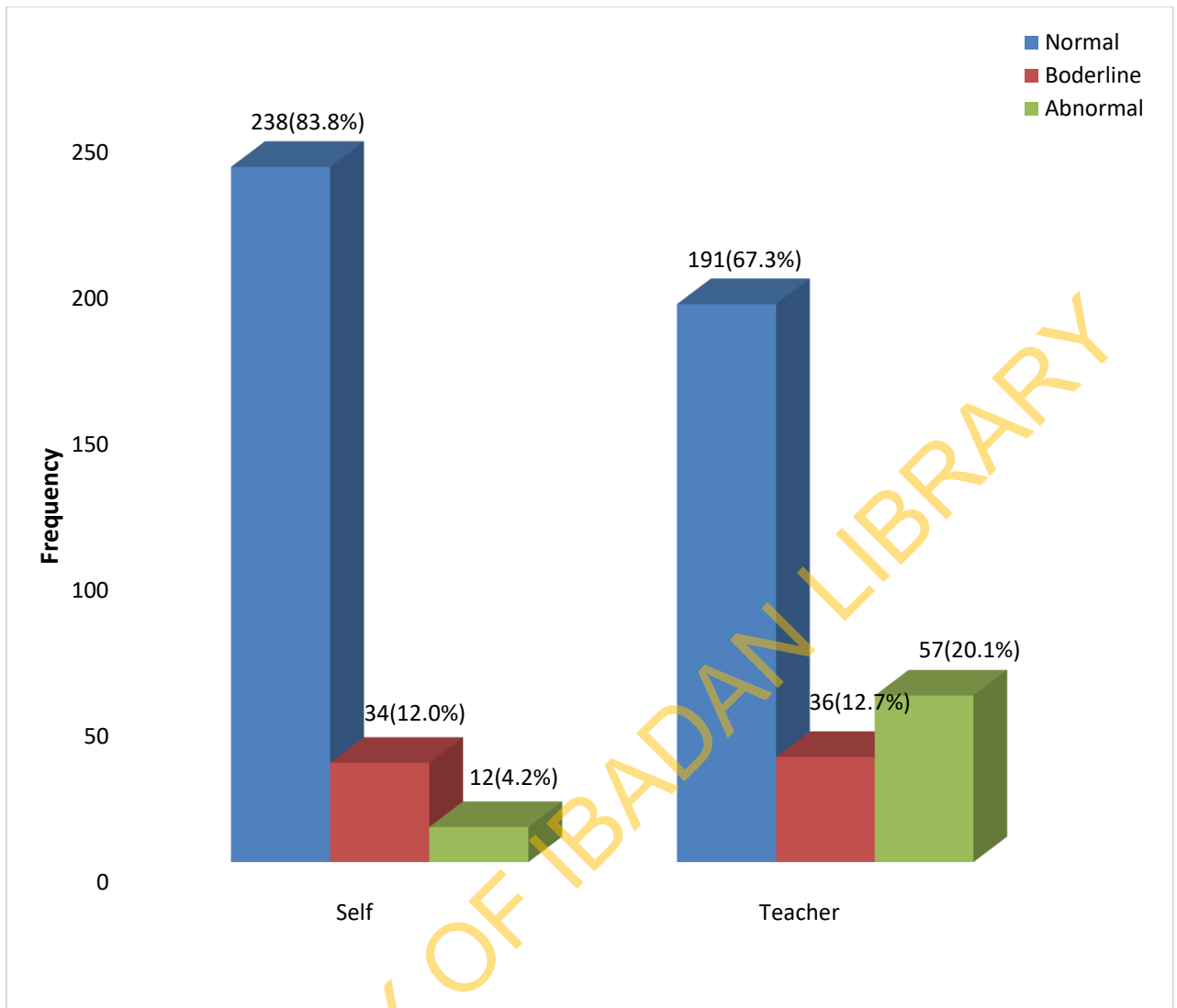
Variable	Type of school			$\chi^2$	p-value
	Private n (%)	Public n (%)	Total N (%)		
<b>Wasting</b>					
Yes	4 (3.6)	20 (11.5)	24 (8.5)	5.379	<b>0.020*</b>
No	106 (96.4)	154 (88.5)	260 (91.5)		
<b>Stunting</b>					
Yes	1 (0.9)	20 (11.5)	21 (7.4)	11.028	<b>0.001*</b>
No	109 (99.1)	154 (88.5)	263 (92.6)		
<b>Underweight</b>					
Yes	0 (0.0)	9 (5.2)	9 (3.2)	5.876 <sup>F</sup>	<b>0.014*</b>
No	110 (100.0)	165 (94.8)	275 (96.8)		
<b>Normal weight</b>					
Yes	88 (80.0)	113 (64.9)	201 (70.8)	7.387	<b>0.007*</b>
No	22 (20.0)	61 (35.1)	83 (29.2)		
<b>Overweight</b>					
Yes	13 (11.8)	9 (5.2)	22 (7.7)	4.165	<b>0.041*</b>
No	97 (88.2)	165 (94.8)	262 (92.3)		
<b>Obese</b>					
Yes	4 (3.6)	3 (1.7)	7 (2.5)	1.025 <sup>F</sup>	0.436
No	106 (96.4)	171 (98.3)	277 (97.5)		

## 4.3 Prevalence of mental disorders

### 4.3.1 Prevalence of mental health problems on the SDQ

The prevalence of mental health problems using SDQ as screening instrument was 20.4% (see Figure 4.3.1a). Majority 238(83.8%) out of the 284 participants on self-rated version had normal scores, 34 (12.0%) had scores in the borderline range while 12(4.2%) had scores in the abnormal range. Using the teachers-rated version of the SDQ, 191(67.3%) out of the 284 participants scored normal, 36(12.7%) and 57(20.1%) were borderline and abnormal scores respectively (see Figure 4.3.1b below).

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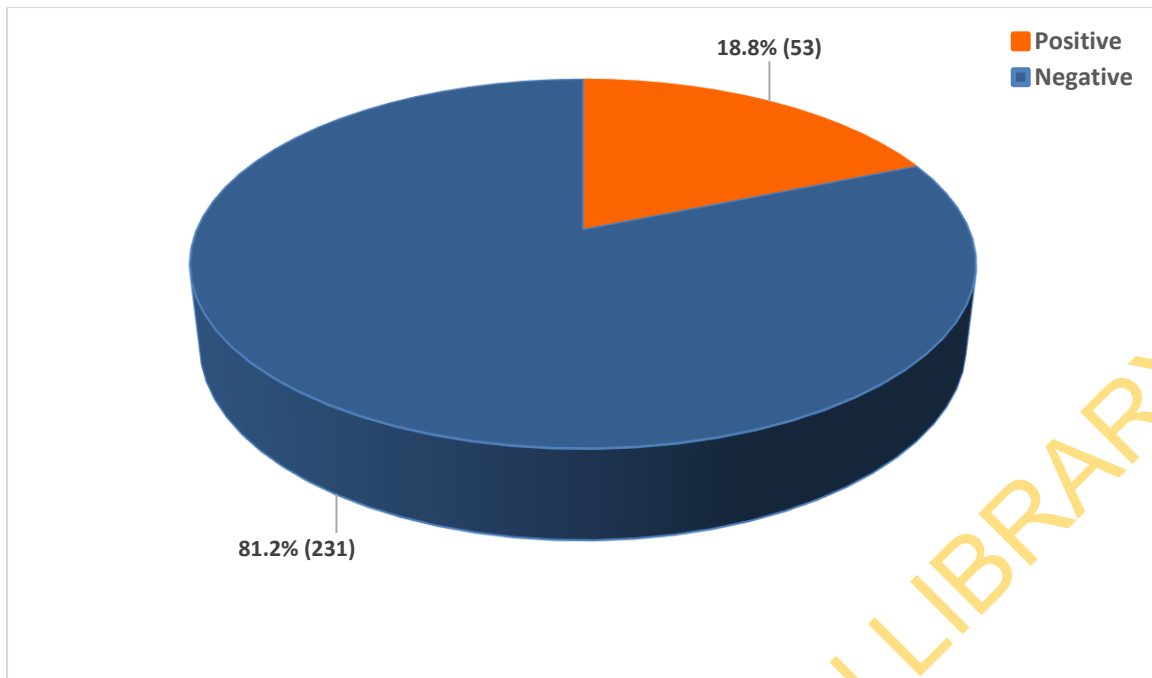
**Figure 4.3.1:** Screening for probable psychiatric morbidity among the children using (SDQ) – self and teacher rating

#### 4.3.2 Prevalence of DSM-V Disorders using K-SADS-PL 2016

A total of 81 participants were interviewed using KSADS-PL (2016) while fifty-three (53) of them met the criteria for DSM-V psychiatric diagnosis, giving a weighted prevalence of **18.8%** in the entire sample population (see Table 4.3.2).

**Table 4.3.2: Prevalence of psychiatric morbidity (weighted prevalence)**

Psychiatric morbidity	Frequency	Percent
Cases	53	18.8
Non-cases	231	81.2



**Figure 6:** Prevalence of psychiatric diagnosis among participants (using weighting based on second stage)

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### 4.3.3 Patterns of DSM-V Disorders among Participants

The prevalence of disruptive behavioural disorders (Oppositional Defiant Disorder) was 7(2.5%) neuro-developmental disorders (Attention Deficit Hyperactivity Disorder and Autism Spectrum disorder) was 19(6.7%), anxiety disorders (Generalized Anxiety Disorder, Social phobia, Post Traumatic Stress Disorder) are 31 (10.9%) and mood disorder (depression) was 11(3.8%) respectively.

The prevalence rate of specific disorders were; ADHD 18(6.3%), ODD 7(2.5%), autism 1(0.4%) and depression 11(3.8%). In addition, phobias (social or agoraphobia), GAD and PTSD were 18(6.3%), 10(3.5%) and 3(1.1%) respectively.

ADHD and anxiety disorders are prevalent among males (20.2%; 12.3% vs. 4.7%; 9.4%) when compared with females. Meanwhile, depression and phobia are prevalent in females (6.7%, 9.4% vs. 0.7%, 2.9%) when compared with males (see Table 4.3.3b).



**Table 4.3.3a: Pattern of psychiatric diagnosis among total participants (weighted prevalence)**

<b>Psychiatry diagnosis</b>	<b>Present</b>	<b>Absent</b>
	<b>n (%)</b>	<b>n (%)</b>
<b>Anxiety disorders</b>		
Generalized anxiety disorder	10 (3.5)	274 (96.5)
Phobia	18 (6.3)	268 (94.4)
PTSD	3 (1.1)	281 (98.9)
<b>Affective disorder</b>		
Depression	11 (3.8)	273 (96.2)
<b>Neurodevelopmental disorder</b>		
Autism	1 (0.4)	283 (99.6)
ADHD	18 (6.3)	266 (96.7)
<b>Behavioural disorder</b>		
Oppositional deviant disorder	7 (2.5)	277 (97.5)

**NB: Some respondents have more than one diagnosis**

**Table 4.3.3b: Distribution of specific mental disorders based on gender- weighted prevalence**

	<b>Male</b>	<b>Female</b>	<b>Total</b>
<b>Psychiatry diagnosis</b>	<b>n (%)</b>	<b>n (%)</b>	<b>N (%)</b>
<b>Anxiety disorder</b>			
Generalized anxiety disorder	10 (7.2)	0 (0.0)	10 (3.5)
Phobias	4 (2.9)	14 (9.4)	18 (6.3)
PTSD	3 (2.2)	0 (0.0)	3 (1.1)
<b>Affective disorder</b>			
Depression	1 (0.7)	10 (6.7)	11 (3.8)
<b>Neurodevelopmental disorder</b>			
Autism	0 (0.0)	1 (0.7)	1 (0.4)
ADHD	15 (10.8)	3 (2.0)	18 (6.3)
<b>Behavioural disorder</b>			
Oppositional deviant disorder (ODD)	3 (2.2)	4 (2.7)	7 (2.5)

**NB: Some respondents have more than one diagnosis**

## 4.4 Correlates of Mental Disorders in Participants

### 4.4.1 Personal socio-demographic correlates associated with DSM-V in participant

Mental disorder is about two-times higher among early adolescents than in children. Twelve out of the 86(14.0%) adolescents aged 10-12 years were diagnosed of at least one mental disorder compared to 15 out of 198(7.6%) children aged 6-9 years ( $\chi^2 = 2.835$ ,  $P = 0.092$ ). (see table 4.4.1a).

Fifteen (15) out of 149 (10.1%) male participants had mental disorder as compared to 12 out of 135 (8.9%) female participants; the difference is however not significant ( $\chi^2 = 0.114$ ,  $P = 0.735$ ).

Mental disorder is higher among public schools pupils 20 out of 174 (11.5%) when compared with 7 out of 110 (6.4%) private schools pupils ( $\chi^2 = 2.062$ ,  $P = 0.151$ ). (See table 4.4.1b).

**Table 4.4.1a: Age and sex distribution of psychiatric diagnosis**

Variable	SDQ		$\chi^2$	<i>p</i> -value	Psychiatric diagnosis		$\chi^2$	<i>p</i> -value
	Positive n(%)	Negative n(%)			Positive n(%)	Negative n(%)		
<b>Age</b>								
<b>(years)</b>								
6 – 9	31(15.7)	167(84.3)	9.139	<b>0.003*</b>	15(7.6)	183(92.4)	2.835	0.092
10 – 12	27(31.4)	59(68.6)			12(14.0)	74(86.0)		
<b>Sex</b>								
Male	29(19.5)	120(80.5)	0.178	0.673	15(10.1)	134(89.9)	0.114	0.735
Female	29(21.5)	106(78.5)			12(8.9)	123(91.1)		
<b>Age (6-9)</b>								
<b>Sex</b>								
Male	14(13.2)	92(86.8)	1.036	0.309	8(7.5)	98(92.5)	0.000	0.987
Female	17(18.5)	75(81.5)			7(7.6)	85(92.4)		
<b>Age(10-12)</b>								
<b>Sex</b>								
Male	15(34.9)	28(65.1)	0.486	0.486	7(16.3)	36(83.7)	0.387	0.534
Female	12(27.9)	31(72.1)			5(11.6)	38(88.4)		

$\chi^2$ : Chi-square test; \*: *p* value <0.05

**Table 4.4.1b: Personal socio-demographic characteristics associated with psychiatric diagnosis**

Variable	Psychiatric diagnosis		Total N	$\chi^2$	p-value
	Yes n (%)	No n (%)			
<b>Age (years)</b>					
6 – 9	15(7.6)	183(92.4)	198	2.835	0.092
10 – 12	12(14.0)	74(86.0)	86		
<b>Sex</b>					
Male	15(10.1)	134(89.9)	149	0.114	0.735
Female	12(8.9)	123(91.1)	135		
<b>Class</b>					
Primary 1 – 3	25 (9.9)	227 (90.1)	252	10.312 <sup>F</sup>	0.091
Primary 4 – 6	2 (6.3)	30 (93.8)	32		
<b>Type of school</b>					
Private	7(6.4)	103(93.6)	110	2.062	0.151
Public	20(11.5)	154(88.5)	174		
<b>Religion</b>					
Islam	3(15.0)	17(85.0)	20	0.755 <sup>F</sup>	0.419
Christianity	24(9.1)	240(90.9)	264		

$\chi^2$ : Chi square test; F: Fisher's exact; \*: p value <0.05

#### 4.4.2a Family socio-demographic correlates associated with psychiatric diagnosis

Eight out of 24 (33.3%) participants whose parent were either separated/divorced/widowed were diagnosed of mental disorders compared with 19 out of 260 (7.3%) whose parents were married ( $\chi^2 = 17.299$ ,  $P = 0.001$ ).

Six out of 28 (21.4%) respondents who are currently living with a single parent (either by death/separated/divorced) were diagnosed of mental disorders compared with 4 out of 21 (19.0%) respondents who live with grandparent or other relations and 17 out of 235 (7.2%) respondents who live with both parent ( $\chi^2 = 7.917$ ,  $P = 0.013$ ).

Five out of 21 (23.8%) participants that were brought up by a single parent were diagnosed of mental disorders compared to participants brought up by either the biological parent or grandparents [21 (8.4%) vs. 1 (7.1%)] ( $\chi^2 = 4.698$ ,  $P = 0.078$ ) (see Table 4.4.2).

**Table 4.4.2a: Family socio-demographic characteristics associated with psychiatric diagnosis**

Variable	Psychiatric diagnosis			$\chi^2$	p-value
	Yes n (%)	No n (%)	Total N (%)		
<b>Family type</b>					
Monogamous	24(9.5)	228(90.5)	252	0.001 <sup>F</sup>	1.000
Polygamous	3(9.4)	29(90.6)	32		
<b>Marital status of parents</b>					
Married	19 (7.3)	241 (92.7)	260	17.299 <sup>F</sup>	<b>0.001*</b>
Separated/divorce/widowed	8 (33.3)	16 (66.7)	24		
<b>Who the child is living with currently</b>					
Parents	17 (7.2)	218 (92.8)	235	7.917 <sup>F</sup>	<b>0.013*</b>
Single parent	6 (21.4)	22 (78.6)	28		
Grandparents and others	4 (19.0)	17 (81.0)	21		
<b>Who brought you up from your childhood/ Who took care of</b>					
Parents	21 (8.4)	228 (91.6)	249	4.698	0.078
Single parent	5 (23.8)	16 (76.2)	21		
Grandparents and others	1 (7.1)	13 (92.9)	14		
<b>Fathers Occupation</b>					
Unskilled	12(13.3)	78(86.7)	90	3.394	0.183
Semiskilled	10(9.90)	91(90.1)	101		
Professional	5(5.4)	88(94.6)	93		
<b>Educational status of father</b>					
No formal/Primary	6(10.3)	52(89.7)	58	0.059	0.807
Secondary/ Tertiary	21(9.3)	205(90.7)	226		

$\chi^2$ : Chi square test; F: Fisher's exact; \*: p value <0.05

#### 4.4.2b Family socio-demographic correlates of participants' mothers

Ten out of 61 (16.4%) participants whose mothers had less or up to 6 years elementary education were diagnosed of mental disorders compared with 17 out of 223 (7.6%) participants whose mother had up to secondary or tertiary level of education ( $\chi^2 = 4.282$ ,  $P = 0.039$ ).

Twenty-five out of 215 (11.6%) children who reported that their mothers had up to 4 children were diagnosed of mental disorder compared with 2 out of 69 (2.9%) children whose mothers had only 2 children; this difference is statistically significant ( $\chi^2 = 4.110$ ,  $P = 0.013$ ).

Fourteen (14) out of 101 (13.9%) children whose mother's job was unskilled were more diagnosed of mental disorders compared with 8 out of 90 (8.9%) children whose mother's occupation was semi-skilled and 5 out of 93 (5.4%) children whose mother's occupation was professional ( $\chi^2 = 4.627$ ,  $P = 0.128$ ).



**Table 4.4.2b: Family socio-demographic characteristics associated with psychiatric diagnosis**

Variable	Psychiatric diagnosis		Total N (%)	$\chi^2$	p-value
	Yes n (%)	No n (%)			
<b>Educational status of mother</b>					
No formal/Primary	10 (16.4)	51 (83.6)	61	4.282	<b>0.039*</b>
Secondary/ Tertiary	17 (7.6)	206 (92.4)	223		
<b>Mother's occupation</b>					
Unskilled	14 (13.9)	87 (86.1)	101	4.110	0.128
Semiskilled	8 (8.9)	82 (91.1)	90		
Professional	5 (5.4)	88 (94.6)	93		
<b>Number of mother's children</b>					
1 – 2	2(2.9)	67(97.1)	69	4.627	<b>0.031*</b>
3 – 4	25(11.6)	190(88.4)	215		
<b>Position among mother's children</b>					
First	10 (9.8)	92 (90.2)	102	0.016	0.898
Others	17 (9.3)	165 (90.7)	182		
<b>Position among father's children</b>					
First	9 (9.2)	89 (90.8)	98	0.018	0.893
Others	18 (9.7)	168 (90.3)	186		
<b>Engage in work to earn money after school</b>					
Yes	6(17.1)	29(82.9)	35	2.705 <sup>F</sup>	0.120
No	21(8.4)	228(91.6)	249		

$\chi^2$ : Chi square test; F: Fisher's exact; \*: p value <0.05

#### 4.4.3 School characteristics associated with psychiatric diagnosis

Table 4.5.3 below shows three (3) out of 18 (16.7%) respondents whose academic performance was below average (0-39%) reported high mental disorder compared to 18 out of 123 (14.6%) participants of average academic performance and 6 out of 143 (4.2%) participants with above average performance. This association was statistically significant ( $\chi^2=9.52$ ,  $P=0.009$ ).

Seven (7) out of 38 (18.4%) respondents whose class attendance was greater than 30 were diagnosed of mental disorder as compared to 15 out of 172 (8.7%) participants whose class attendance was 21-30 and 5 out of 74 (6.8%) respondents whose attendance was 10-20. This difference was however not statistically significant ( $P=0.117$ )(See Table 4.5.3).

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**Table 4.4.3: The school characteristics and psychiatric diagnosis of participants**

Variable	Psychiatric diagnosis			$\chi^2$	p-value
	Yes n (%)	No n (%)	Total N(%)		
<b>What term did you start in this school</b>					
First term	23(9.6)	217(90.4)	240	2.360 <sup>F</sup>	0.264
Second term	2(5.7)	33(94.3)	35		
Third term	2(22.2)	7(77.8)	9		
<b>What class did you start in this school</b>					
Primary 1 – 3	25 (9.9)	227(90.1)	252	0.445 <sup>F</sup>	0.751
Primary 4 – 6	2 (6.3)	30 (93.8)	32		
<b>Number in class</b>					
10 – 20	5 (6.8)	69 (93.2)	74	4.284	0.117
21 – 30	15 (8.7)	157(91.3)	172		
> 30	7 (18.4)	31 (81.6)	38		
<b>Do you do well academically</b>					
Yes	22(8.5)	236(91.5)	258	3.145 <sup>F</sup>	0.085
No	5(19.2)	21(80.8)	26		
<b>What is the overall percentage of your last term exam</b>					
0 – 39%	3(16.7)	15(83.3)	18	9.520	<b>0.009*</b>
40 – 69%	18(14.6)	105(85.4)	123		
70 – 100%	6(4.2)	137(95.8)	143		
<b>Is your school on school feeding program</b>					
Yes	14(11.2)	111(88.8)	125	0.744	0.388
No	13(8.2)	146(91.8)	159		
<b>How many terms have you benefitted on the school feeding program</b>					
1 term	7(10.3)	61(89.7)	68	0.123	0.726
2 terms	7 (12.3)	50 (87.7)	57		

$\chi^2$ : Chi square test; F: Fisher's exact; \*: p value <0.005

#### **4.5 Predictors of psychiatry diagnosis among study participants**

The predictors of psychiatric morbidity among the school children using binary logistic regression (multivariable analysis) is as shown on table 4.5 below.

Children whose parents were separated/divorced/widowed were 5 times more likely to have psychiatric diagnosis than those whose parents were married (CI: 1.419 – 21.908; *OR* 5.576, *p* value 0.014).

Pupils who performed poorly (<40%) in the last term prior to data collection were 4 times more likely to be diagnosed with a mental health disorder compared to those who performed excellently ( $\geq 70\%$ ) (CI: 1.646 – 13.429; *OR* 4.702, *p* value 0.004).

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**Table 4.5: Predictors of psychiatric diagnosis among the study participants**

Variable	B	p value	OR (95% CI)
<b>Marital status of parents</b>			
Married			1
Separated/divorced/ widowed	1.718	<b>0.014*</b>	5.576 (1.419 – 21.908)
<b>Who the child is living with</b>			
Both parents			1
Single parents	0.198	0.794	1.219 (0.276 – 5.392)
Grandparents or others	-0.209	0.798	0.812 (0.165 – 3.998)
<b>Educational status of mother</b>			
Secondary/Tertiary			1
No formal/ Primary	1.472	0.060	4.358 (0.940 – 20.197)
<b>Number of mother's children</b>			
1 – 2			1
3 – 4	1.323	0.133	3.754 (0.670 – 21.042)
<b>What is the overall percentage of your last term exam</b>			
70 – 100%			1
40 – 69%	1.323	0.133	3.754 (0.670 – 21.042)
0 – 39%	1.548	<b>0.004*</b>	4.702 (1.646 – 13.429)

**B: Coefficient of Binary Logistic regression; OR: Odds Ratio; 95% CI: 95% Confidence**

**Interval; \*: p value <0.05; Predictive value: 91.2%**

#### **4.6 The relationship between nutritional status and psychiatric diagnosis of participants**

Twenty (20) out of 201(10.0%) participants who had normal nutritional status were diagnosed of at least one mental disorder compared with only 7 out of the 83 (23.2%) participants who were malnourished.

Two out of 24 (8.3%) participants that had wasted nutritional status were diagnosed of at least one mental disorder ( $\chi^2= 0.042$ ,  $P=1.000$ ).

Two out of 21 (9.5%) stunted participants in the study were diagnosed of mental disorder ( $P=1.000$ ).

Two out of the 9 (22.2%) children that were underweight had mental disorder(s) ( $\chi^2= 1.747$ ,  $P=0.207$ ).

One out of 22 (4.5%) overweight children have mental disorder ( $\chi^2= 0.754$ ,  $P=1.000$ ).

**Table 4.6: Nutritional status of the children and psychiatric diagnosis**

Variable	Psychiatric diagnosis		Total N (%)	$\chi^2$	p-value
	Yes n (%)	No n (%)			
<b>Wasting</b>					
Yes	2 (8.3)	22 (91.7)	24	0.042 <sup>F</sup>	1.000
No	25 (9.6)	235 (90.4)	260		
<b>Stunting</b>					
Yes	2 (9.5)	19 (90.5)	21	0.000 <sup>F</sup>	1.000
No	25 (9.5)	238 (90.5)	263		
<b>Underweight</b>					
Yes	2 (22.2)	7 (77.8)	9	1.747 <sup>F</sup>	0.207
No	25 (9.1)	250 (90.9)	275		
<b>Normal weight</b>					
Yes	20 (10.0)	181 (90.0)	201	0.157	0.692
No	7 (8.4)	76 (91.6)	83		
<b>Overweight</b>					
Yes	1 (4.5)	21 (95.5)	22	0.682 <sup>F</sup>	0.706
No	26 (9.9)	236 (90.1)	262		
<b>Obese</b>					
Yes	0 (0.0)	7 (100.0)	7	0.754 <sup>F</sup>	1.000
No	27 (9.7)	250 (90.3)	277		

Word count- 1,647

## CHAPTER 5

### DISCUSSION, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Discussion

This study was a cross-sectional descriptive study carried out in five primary schools (3 public schools; 2 private) in Ido-Ekiti, Southwest Nigeria. The study aimed to determine the prevalence and correlates of mental disorders and nutritional status of children and adolescents in Ido-Ekiti.

The findings in this study was discussed in the following subsections namely-

- The socio-demographic characteristics of the participants
- Prevalence of mental disorders of participants
- Socio-demographic correlates of mental disorders
- Prevalence of malnutrition of participants
- Association between mental disorders and nutritional problems

##### 5.1.1 Socio-demographic characteristics of participants

###### 5.1.1.1 Personal characteristics of participants

The mean age in the study sample was  $8.57 \pm 1.65$  years. The finding is similar to mean age of  $8.90 \pm 1.9$  years obtained in a study in Enugu that assessed the physical health of in-school children and adolescents between 6-12 years (Eze *et al.*, 2017), but slightly lower to the studies done in other Sub-Saharan African countries which reported a mean age of  $9.8 \pm 1.8$  years (Kwabla, Gyan and Zotor, 2018). The mean age recorded in the current study was however slightly lower than that recorded in some studies carried out in another study in Sub-Saharan African country. In a study carried out in Ghana among school-children reported a mean age of  $9.8 \pm 1.8$  years and majority of the participants were within the age group of 6-9



years (Kwabla, Gyan and Zotor, 2018). The pattern recorded in our study is probably as a result of the population distribution in Nigeria. In Nigeria, children aged 5 to 9 years are the second largest population accounting for 14.5% while early adolescents 10-14 years accounts for 12.5% (Nigeria Population Statistics, 2019). Furthermore, the study was conducted in primary schools and it is therefore logical to find more children than adolescents in primary schools. As concerns the male to female rate, the current study showed that male to female ratio was approximately 1:1. This is contrary to studies carried out in Ethiopia (Abebe *et al.*, 2017) and Egypt (Wahed, Hassan and Eldessouki, 2017) that reported more females than males at a ratio of 1:1.5. The reason for higher percentage of males in this study could be due to higher population of male children within the age group of 5-14 years in Nigeria (Nigeria Statistics, 2019). Nigeria culture also typically show preference of male-child school enrolment more than the female-child (Rahji, 2003). This is as a result of the norm and belief that girls belong to their husbands' households later but boys will shoulder the lineage financial responsibilities (Rahji, 2005).

#### **5.1.1.2 Family characteristics of participants**

Majority (91.5) of the participants' parents were married, and 88.7% of these marriages were in a monogamous setting. This is in contrast to a study conducted in Northwest Nigeria where more than half (58.8%) of the participants' parents were married in polygamous settings (Abdullateef, Adedokun and Omigbodun, 2017). The finding may be because Christianity, which prescribes monogamy, is the dominant religion in the southern region where this current study was conducted (NDHS, 2013). In this study, a tenth (9.9%) of the participants are currently living with a single parent and less than a tenth had lived with other family members. This is in agreement to the findings from previous study that reported a tenth (10.1%) of the children had left their parent at some point to live with family member or any person other than the biological parent, which was as a result of possible food insecurity, poor

household income or resource, this shows that child fostering is widely practiced in Nigeria (Omigbodun, 2004) and it may likely happen in the affected children at a very young age (Reiss *et al.*, 2019). Majority (79.2%) of the participants were born in a large family size of 5 or more. Large family size has been linked to have association with mental health disorders. A higher proportion (68.3%) of children from a large household was reported in a Norwegian mothers and child cohort study; the study reported a significant association between large household size and negative outcome of mental health (Grinde and Tambs, 2016). The higher the household size from 6 or more, the worse the mental health (Grinde and Tambs, 2016). Almost all (75.7%) of the mothers have up to 4 or more children. The high percentage of mothers with 4 children could be due to low patronage of family planning among mothers in the study location. A study among mothers in Ido Ekiti community reported a high percentage (98.6%) of awareness of contraceptives but only 50.5% of them are using contraceptives and the identifiable barrier for not using contraceptives was because the mother still loved to have more children in about one-third (39.5%) of them (Durowade *et al.*, 2017).

Approximately 80% of the participants' fathers and mothers had up to secondary or tertiary education in consistent to Ekiti State adult literacy rate estimated to 65% in men and 60% in women. This could be the reason for high percentage of the participants' parent level of education (NLS, 2010).

### **5.1.1.3 School characteristics of participants**

Two-thirds of the participants attend public schools compared to a third who are in the private schools. This is in accordance to the Nigeria education statistics of Ekiti which estimated rate of enrolment as 56.7% for public schools and 43.3% for private schools (NBS, 2008).

A small percentage (6%) of the participants had poor academic performance. A study in Ghana among school children documented a significant proportion of children with lower academic performance in public schools (Kusi-mensah *et al.*, 2019).

### **5.1.2 Prevalence of SDQ abnormalities among participants**

This study found a high prevalence of SDQ abnormalities (20.4%) in children and early adolescents in the first stage. This finding is in keeping with previous studies conducted using similar screening instrument (SDQ). A study in Bangladesh reported a lower prevalence of 17.9% SDQ abnormality (Mullick and Goodman, 2001). Another study conducted in Enugu, Nigeria using SDQ abnormality found a higher prevalence of 29.5% prevalence of total difficulty scores of 13 out of 44 children and adolescents (Bakare *et al.*, 2010); this study was conducted among children with intellectual disabilities and this explains the high prevalence found in Bakare's study.

### **5.1.3 Prevalence of DSM-V disorders in participants**

The study found the prevalence of mental disorders to be 18.8% using KSADS-PL 2016 to ascertain diagnosis. This is lower than 19.6% reported by (Gureje *et al.*, 1994) in a study that was carried out in Southwest, Nigeria, 23.1% in Uyo (Akpan, Ojinnaka and Ekanem, 2010), and 37% in Zaria (Abdullateef, Adedokun and Omigbodun, 2017); The reason for discrepancy in the prevalence was because this study was conducted in school settings while Gureje's study was done in hospital setting where many of the children that access care are possibly suffering from mental disorders and Abdullateef's study was among the street children who are faced with difficult conditions and adversaries are at increased risk to developing mental disorders.

### **5.1.4 Patterns of DSM-V disorders**

This study found a high prevalence of anxiety disorders (10.9%), as the commonest mental disorders. This differs from published studies that reported conduct disorder (Gureje *et al.*, 1994) and ADHD (Costello, Egger and Angold, 2005) as the most prevalent mental disorders in children. A study in South-south part of Nigeria, reported a prevalence of 14.2% for

anxiety disorders (Nkporbu, 2019). Anxiety disorders was documented to be the most commonest type of psychiatric disorders in childhood; and about 3-24% of children below the age of 12 years develop significant anxiety symptoms that may interfere with their daily functioning (Cartwright-Hatton, McNicol and Doublebay, 2006). The specific anxiety disorders diagnosed in this study were; social phobia (6.3%), GAD (3.5%) and PTSD (1.1%). Social disorders was also documented to be common among children and adolescents between the ages of 5-15 years (Morris *et al.*, 2008). It is the fear of being embarrassed in front of class, in social situations or been rejected by peers in the last 6 months, that has caused some degree of functional impairment. An African study of in-school children and their teachers reported a poor teacher-child relationship with corporal punishment which evokes feelings of fear, anxiety and anger in children. Harsh punishment was documented to be significantly associated with stress, distress and decrease in feelings of confidence but increase feelings of humiliation and helplessness (Omigbodun and Olatawura, 2008; Katrina and Danga, 2013).

Female predominance of social phobia was observed in this study, females are 3-times higher (9.4% vs. 2.9) than males. This finding is consistent with a study (Morris *et al.*, 2008) that reported 2-times prevalence of social phobia in females than in males.

The prevalence of ADHD was 6.3%. This is consistent with the global point prevalence of ADHD among children and adolescents which varied from 1.7% to 17.8% (Merikangas, Nakamura and Kessler, 2009). ADHD was reported to be higher (8%) among children in Puerto-Rico (Canino *et al.*, 2004) but lower (4.96%) in Chinese children (Shen *et al.*, 2018) and (1.6%) Ghanaians (Kusi-Mensah *et al.*, 2019).

The prevalence of depression was 3.8% which is lower than the global median prevalence estimate of 4.0% in the range of 0.2% to 17% in a community study (Merikangas, Nakamura and Kessler, 2009). A higher prevalence was reported in a Nigeria study with 6-12% among

adolescents (Omigbodun *et al.*, 2008; Bella-Awusah *et al.*, 2016) and the difference is because of the study population, these studies were conducted among adolescents only. Females were more depressed than males, which is similar to previous findings (Abiodun, 1993; Nkporbu, 2019).

The prevalence of ODD is 2.5% which is lower to 6% found in a median prevalence in the global study. Adewuya (2007) reported a higher prevalence of 9.3% and this is higher because of a different diagnostic instrument used.

The prevalence of ASD is 0.7% which is consistent with previous studies reported in Lagos, Nigeria (Bakare *et al.*, 2010).

### **5.1.5 Correlates of mental disorders**

Quite a number of socio-demographic characteristics were associated with mental health disorders in this study as discussed in this section.

#### **5.1.5.1 Personal socio-demographic correlates of participants with mental disorders**

Gender, age, chronic physical illness in the child have been reported as child characteristics associated with mental disorders by quite a number of studies (Merikangas *et al.*, 2010; Cortina *et al.*, 2012; Vicente *et al.*, 2012; Canino *et al.*, 2004).

In this study, the prevalence of mental disorders was higher among the adolescent age group than in child age group, though the difference was not statistically significant. This is in agreement with the previous documentation that half of all the mental health problems begin at adolescence before the age of 14 years (WHO, 2005). Several other studies have reported higher prevalence of mental disorders in adolescent age group (Meltzer *et al.*, 2010; Merikangas *et al.*, 2010; Nkporbu, 2019) and this is because adolescent group has been identified as a high risk group for mental health problems. The period of puberty and hormonal changes in them makes mental wellbeing difficult to maintain due to exposure of

risk factors such as socioeconomic problems, harsh parenting, bullying, desire to experiment, peer pressures, and academic pressures which may interrelate to affect their mental health (WHO, 2005).

Mental disorders in males are higher than females in this study; however it was not statistically significant. Male preponderance is unsurprising, as studies have reported higher prevalence of mental disorders in male children and adolescents than their female counterparts (Costello, Egger and Angold, 2005; Merikangas *et al.*, 2010; Abiodun *et al.*, 2011; Shen *et al.*, 2018).

#### **5.1.5.2 Family socio-demographic correlates of participants with mental disorders**

Divorced/separated/unmarried or widowed status (Meltzer *et al.*, 2010), children whose current caregiver is single parent or other relatives (Omigbodun *et al.*, 2008), low maternal education (Gureje *et al.*, 1994), the number of children the mother has (Ajao *et al.*, 2010; Carballo *et al.*, 2013), have been published in studies as family socio-demographic characteristics that were associated with mental disorders in children and adolescents.

There was a significant association between having parents who are either divorced or separated or widowed and mental disorders in children and adolescents in the study. This finding is in keeping with the reports of Golberg *et al.*, (2014) and Caballo *et al.*, (2013) who reported that children of mothers with marital disharmony are at increased risk of developing mental disorders compared to their peers from married parents. This family discord would impinge on the quality of the parent's relationship which affects directly or indirectly the child's behaviours, growth and development (Meltzer *et al.*, 2010). For example, children of single parent mothers, low maternal education, large family size and high number of mothers' children were reported to be predictors of conduct disorders (Carballo *et al.*, 2013).

There was a significant association between children currently living with a single parent, or relatives and having mental disorders. This finding is in agreement with previous study

conducted in Nigeria, which revealed that about a third of African children live with persons other than their parents (Omigbodun et al., 2008; Bella-Awusah *et al.*, 2016). In addition, higher prevalence of anxiety have been identified among children of unstable family structure, who relocates to live with a financially empowered relative for care and education after parental death or separation (Omigbodun et al., 2008).

One in six (16.4%) children of mothers with less or up to primary education had mental disorders, this association is statistically significant. Norwegian study of mother, father and children, reported 1 in 5 children having a mother with maternal education lower than secondary level had ADHD symptoms and poor academic grades compared to 1 in about 20 children having mothers with more than secondary education (Torvik et al, 2020).

The number of mother's children was significantly associated with diagnosis of mental disorder in children as found in this present study. That is, children whose mother had up to 4 children were 3 times more likely to be diagnosed of a mental health problem. This finding agrees to Downey (1995), who reported that having many siblings is associated with higher risk of mental disorders mediated by the resource dilution model than 1-2 siblings. Resource dilution process enables only children to enjoy the parents' energy, time, income and other resources without any competitors. Contrarily, another argument was that, prevalence of mental disorder was found to be lower in children with more than 4 siblings than those with less than four (Meltzer *et al.*, 2010); because of the adequate support received from the older siblings.

### **5.1.5.3 School socio-demographic correlates of participants with mental disorders**

Many studies have reported the positive association of mental disorder with academic performance, grade repetition, trouble with teachers and experiencing bullying in school (Kusi-Mensah *et al.*, 2019; Gureje and Omigbodun, 1995; Anda, 2010). In this study, there was a similar finding, there was a positive association between academic performance and

mental disorders, and there was statistically significant. One in 6 (16.7%) children who have poor academic performance had mental disorder. The high prevalence of anxiety in the children studied could be partly responsible for over one-sixths of them

#### **5.1.6 Socio-demographic predictors of mental disorder**

In this study, parental separation/divorced or widowed and poor academic performance were identified to be independently associated with an increased risk of any DSM-V disorders.

Children whose parents were separated/ divorced/widowed were 5 times more likely to have mental disorder than those whose parents were married. Likewise, children with poor academic performance were 4 times more likely to have mental disorder than those who performed excellently.

#### **5.1.7 Prevalence of Malnutrition**

A third of the study participants were malnourished. The prevalence of thinness, stunting, underweight were 8.5%, 7.4%, 3.2% respectively while overweight is 7.7% and obesity 2.5%. This findings are lower to the proportions reported among children aged 9-14 years school children in Eastern Cape province of South Africa; 61.8% underweight, 3.8% overweight and 2.1% obese (Gomwe *et al.*, 2019) and in Indian children aged 5-19 years were 46.8% underweight, 33.3% wasting, 18.5% stunted (Srivastava *et al.*, 2012). The later study was conducted largely among early adolescents compared to the children largely in this study, whereas the latter study was carried out in rural slum in Indian where there is high rate of food insecurity and poverty, in which many children may have to go hungry on many occasions (Srivastava *et al.*, 2012), this may be responsible for the high prevalence of malnutrition. The similarities of this study with another study conducted in Ebonyi, Nigeria found 5.6% underweight, 6.2% overweight and 3.0% obesity (Asiegbu *et al.*, 2017). The two studies are both conducted in rural school settings and similar study population.



In this study, underweight and stunting are predominant in males. A study in Indian contradicts this finding, as underweight was reported to be more prevalent among Indian girls than boys (Srivastava *et al.*, 2012). However, stunting is predominant in boys than girls; males are 3 times more stunted than the girls. This is in agreement with the study among rural adolescents in Ibadan, Nigeria (Omigbodun *et al.*, 2010) and Guinea Bissau among 5-19 years old children and adolescents (Saltzman *et al.*, 2017) which reported 3-times rate of stunting in boys (10.7%) than in the girls.

On the other hand, girls were found to be predominantly wasted and overweight than boys in this study. Similar finding was reported in other Sub-Saharan African countries studies such as Ghana (Agbozo, Atito and Abubakari, 2016); Guinea Bissau (Saltzman *et al.*, 2017) and South Africa (Gomwe *et al.*, 2019).

Higher proportions of stunting, wasting, and underweight were obtained among the children attending public schools. Poverty has a relationship with malnutrition. Children who are from a low socioeconomic status are likely to be impoverished with little or no access to adequate food supply; this will affect the nutritional status of children living in this household. Whereas, overweight and obesity are 2 times higher among private schools attendees. This finding agrees with other rural communities studies (Omigbodun *et al.*, 2010). This could be because children attending private schools are from families of high socio-economic status who had access to adequate food and overfed the children. The children are also engaged in activities of less physical activity, so they are predisposed to be overweight or obese.

### **5.8 Relationship between mental disorders and nutritional status**

In this study, the association between mental disorder and the anthropometric indices of the nutritional status was not statistically significant. One in 3 children and adolescents who were either stunted, thinned or underweight in this study have mental disorders, this shows there is an association but it was however not significant. This finding was consistent with a previous

study done among adolescents and young adults that reported no significant association between being overweight or underweight and mental disorders (Bruffaerts *et al.*, 2008). However, (Oddy *et al.*, 2009) study found a positive association between mental disorder and the dietary practices of people in the western countries who are overweight. Similarly, a systematic review of many epidemiological studies reported a consistent trend between unhealthy dietary patterns and worse mental health in children and adolescents (O'Neil *et al.*, 2014). An inconsistent finding was found in the relationship between healthy dietary patterns or quality of food and mental disorder, this may be explained as, children who internalizes may eat more poorly and this will have a negative impact on their nutritional status. In this study, the reason why there was no association between nutritional status and mental disorder could likely be because mental disorder causality is a multi-factorial; nutritional status alone as an entity may not be enough to cause mental disorder in the child as the presence of other co-existing stressful life events may result to developing mental disorder. In addition, the level of the nutritional status may not be severe enough to cause mental disorder.

## **5.2 Conclusion**

This study found a high prevalence of DSM-V disorders among Ido Ekiti in-school children and adolescents. The prevalence was higher among boys than girls and higher among the early adolescent age group (10-12 years) than those in child age group (6-9 years). Mental disorders are prevalent among children in public schools than those private schools. Anxiety disorders are the most prevalent mental disorder, followed by ADHD & ODD, depression and ASD. Socio-demographic characteristics such as parental separation or divorced or death or widowed, caregiver other than the biological parents, illiterate mother or low level of education and poor academic performance were significantly associated with mental disorders but children whose parents were separated/divorced/widowed and poor academic performance are the only 2 predictors of mental disorder.

### **5.3 Strengths**

- This is the first study done at Ido Ekiti that looked at the prevalence and correlates of mental disorders, however previous studies done were prevalence on a specific mental disorder.
- The use of both screening tool (SDQ) and a diagnostic KSADS-PL 2016 clinical interview to establish the diagnosis for specific mental disorders.

### **5.4 Limitations**

- The inter-rater reliability was not ascertained (training of the teachers together on how to rate the pupils on the SDQ teacher's-rating questionnaire) to prevent bias. However, each of the teachers was explained to individually.
- The study was done in one area of the state and this may not be the representative of the entire state

### **5.5 Recommendations**

- Mental health services, awareness and advocacy should be scaled-up in Ekiti State.
- To commence activities that will improve mental health of children and adolescents in primary schools should be included to help improve their academic performance.
- To improve the consistency of the existing school feeding programme in public primary schools to ensure daily provision of daily meals to all pupils to improve the nutritional problems.

**Word count- 3,560**

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## APPENDIX I

### SAMPLING WEIGHT CALCULATION

SDQ status: 1 = case

0 = non cases

Interview status: 1 = true cases

0 = false cases

#### Sampling weight:

$$\text{For Cases} = \frac{\text{Cases in phase 1 (SDQ)}}{\text{Cases in phase 2 (interview)}} = \frac{58}{58} = 1$$

$$\text{For Non - Cases} = \frac{\text{Cases in phase 1 (GHQ)}}{\text{Cases in phase 2 (interview)}} = \frac{226}{23} = 9.8261$$

Prevalence

$$= \frac{\text{Sum of the product of sampling weight and interview status}}{\text{Sum of sampling weight}}$$

Therefore,

Prevalence of Psychiatric morbidity=

$$\frac{\sum w_i y_i}{\sum w_i} = \frac{24 + (3 \times 9.8261)}{284} = 18.8\%$$

Prevalence of Generalized Anxiety Disorder =

$$\frac{\sum w_i y_j}{\sum w_i} = \frac{0 + (1 \times 9.8261)}{284} = 3.5\%$$

Prevalence of Phobia=

$$\frac{\sum w_i y_j}{\sum w_i} = \frac{8 + (1 \times 9.8261)}{284} = 6.3\%$$

Prevalence of Depression =

$$\frac{\sum w_i y_j}{\sum w_i} = \frac{1 + (1 \times 9.8261)}{284} = 3.8\%$$

Prevalence of Post-Traumatic Stress Disorder =

$$\frac{\sum w_i y_j}{\sum w_i} = \frac{3 + (0 \times 9.8261)}{284} = 1.1\%$$

Prevalence of Autism =

$$\frac{\sum w_i y_j}{\sum w_i} = \frac{1 + (0 \times 9.8261)}{284} = 0.4\%$$

Prevalence of ADHD =

$$\frac{\sum w_i y_i}{\sum w_i} = \frac{8 + (1 \times 9.8261)}{284} = 6.3\%$$

Prevalence of Oppositional Deviant Disorder (ODD) =

$$\frac{\sum w_i y_i}{\sum w_i} = \frac{7 + (0 \times 9.8261)}{284} = 2.5\%$$

APPENDIX II A

SAMPLING WEIGHT FOR PSYCHIATRIC MORBIDITY (DIAGNOSIS)

S N	SDQ Status	Sampling Weight (w <sub>i</sub> )	Psychiatric diagnosis		GAD		Phobia		Depression		
			Intervie w Status (y <sub>i</sub> )	w <sub>i</sub> y <sub>j</sub>	Intervie w Status (y <sub>i</sub> )	w <sub>i</sub> y <sub>j</sub>	Intervie w Status (y <sub>i</sub> )	w <sub>i</sub> y <sub>j</sub>	Intervie w Status (y <sub>i</sub> )	w <sub>i</sub> y <sub>j</sub>	
				1.000		0.000		0.000		0.000	
1	1	1.0000	1.0000	0	0.0000	0	0.0000	0	0.0000	0	
				1.000		0.000		0.000		0.000	
2	1	1.0000	1.0000	0	0.0000	0	0.0000	0	0.0000	0	
				0.000		0.000		0.000		0.000	
3	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0	
				1.000		0.000		0.000		0.000	
4	1	1.0000	1.0000	0	0.0000	0	0.0000	0	0.0000	0	
				0.000		0.000		0.000		0.000	
5	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0	
				1.000		0.000		1.000		0.000	
6	1	1.0000	1.0000	0	0.0000	0	1.0000	0	0.0000	0	
				0.000		0.000		0.000		0.000	
7	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0	
				1.000		0.000		0.000		0.000	
8	1	1.0000	1.0000	0	0.0000	0	0.0000	0	0.0000	0	
				0.000		0.000		0.000		0.000	
9	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0	
				0.000		0.000		0.000		0.000	
10	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0	
				0.000		0.000		0.000		0.000	
11	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0	
				0.000		0.000		0.000		0.000	
12	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0	
				0.000		0.000		0.000		0.000	
13	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0	
				0.000		0.000		0.000		0.000	
14	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0	
				1.0000	1.000	0.0000	0.000	1.0000	1.000	0.0000	0.000
15	1	1.0000									

			0	0	0	0	0	0	0
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
16	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
17	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
18	1	1.0000	1.0000	0	0.0000	0	0.0000	0	0.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
19	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
21	1	1.0000	1.0000	0	0.0000	0	0.0000	0	0.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
23	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			1.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000
26	1	1.0000	1.0000	0	0.0000	0	1.0000	0	0.0000
			1.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000
27	1	1.0000	1.0000	0	0.0000	0	1.0000	0	0.0000
			1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
28	1	1.0000	1.0000	0	0.0000	0	0.0000	0	0.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
29	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30	1	1.0000	1.0000	0	0.0000	0	0.0000	0	0.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
31	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
32	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000

			0.000	0.000	0.000	0.000	0.000	0.000	0.000
33	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			1.000	0.000	0.000	0.000	0.000	0.000	0.000
34	1	1.0000	1.0000	0	0.0000	0	0.0000	0	0.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
35	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
36	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
37	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			1.000	0.000	0.000	0.000	0.000	0.000	0.000
38	1	1.0000	1.0000	0	0.0000	0	0.0000	0	0.0000
			1.000	0.000	0.000	0.000	0.000	0.000	0.000
39	1	1.0000	1.0000	0	0.0000	0	0.0000	0	0.0000
			1.000	0.000	0.000	1.000	0.000	0.000	0.000
40	1	1.0000	1.0000	0	0.0000	0	1.0000	0	0.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
41	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
42	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			1.000	0.000	0.000	1.000	0.000	0.000	0.000
43	1	1.0000	1.0000	0	0.0000	0	1.0000	0	0.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
44	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			1.000	0.000	0.000	0.000	0.000	0.000	0.000
45	1	1.0000	1.0000	0	0.0000	0	0.0000	0	0.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
46	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			1.000	0.000	0.000	0.000	0.000	1.000	0.000
48	1	1.0000	1.0000	0	0.0000	0	0.0000	0	1.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
48	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			1.000	0.000	0.000	1.000	0.000	0.000	0.000
49	1	1.0000	1.0000	0	0.0000	0	1.0000	0	0.0000
			0.0000	0.000	0.0000	0.000	0.0000	0.000	0.000
50	1	1.0000							

			0	0	0	0	0	0	0
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
51	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
52	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
53	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
54	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000
			1.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000
55	1	1.0000	1.0000	0	0.0000	0	1.0000	0	0.0000
			1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
56	1	1.0000	1.0000	0	0.0000	0	0.0000	0	0.0000
			1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
57	1	1.0000	1.0000	0	0.0000	0	0.0000	0	0.0000
			1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
58	1	1.0000	1.0000	0	0.0000	0	0.0000	0	0.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
59	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000
			9.8261	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
60	0	9.8261	1.0000	1	0.0000	0	0.0000	0	0.0000
			9.8261	0.0000	0.0000	9.8261	0.0000	9.8261	9.8261
61	0	9.8261	1.0000	1	0.0000	0	1.0000	1	1.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
62	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
63	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
64	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
65	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
66	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000
			9.8261	9.8261	0.0000	0.0000	0.0000	0.0000	0.0000
67	0	9.8261	1.0000	1	1.0000	1	0.0000	0	0.0000

			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
68	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
69	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
70	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
71	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
72	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
73	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
74	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
75	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
76	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
77	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
78	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
79	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
80	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
81	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	58	284	27	53	1	10	9	18	2	11



APPENDIX II B

**SAMPLING WEIGHT FOR PSYCHIATRIC MORBIDITY (DIAGNOSIS)**


S N	SDQ Status	Sampling Weight (w <sub>i</sub> )	PTSD		Autism		ADHD		ODD	
			Intervie w Status (y <sub>i</sub> )	w <sub>i</sub> y <sub>j</sub>	Intervie w Status (y <sub>i</sub> )	w <sub>i</sub> y <sub>j</sub>	Intervie w Status (y <sub>i</sub> )	w <sub>i</sub> y <sub>j</sub>	Intervie w Status (y <sub>i</sub> )	w <sub>i</sub> y <sub>j</sub>
				0.000		0.000		0.000		1.000
1	1	1.0000	0.0000	0	0.0000	0	0.0000	0	1.0000	0
				0.000		0.000		1.000		0.000
2	1	1.0000	0.0000	0	0.0000	0	1.0000	0	0.0000	0
				0.000		0.000		0.000		0.000
3	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
				0.000		0.000		0.000		1.000
4	1	1.0000	0.0000	0	0.0000	0	0.0000	0	1.0000	0
				0.000		0.000		0.000		0.000
5	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
				0.000		0.000		0.000		0.000
6	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
				0.000		0.000		0.000		0.000
7	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
				0.000		0.000		1.000		0.000
8	1	1.0000	0.0000	0	0.0000	0	1.0000	0	0.0000	0
				0.000		0.000		0.000		0.000
9	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
				0.000		0.000		0.000		0.000
10	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
				0.000		0.000		0.000		0.000
11	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
				0.000		0.000		0.000		0.000
12	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
				0.000		0.000		0.000		0.000
13	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
				0.000		0.000		0.000		0.000
14	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
				0.000		0.000		0.000		0.000
15	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0

			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
16	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
17	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	1.000	
18	1	1.0000	0.0000	0	0.0000	0	0.0000	0	1.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
19	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
20	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			1.000	0.000	0.000	0.000	0.000	0.000	0.000	
21	1	1.0000	1.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
22	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
23	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
24	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
25	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
26	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
27	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	1.000	0.000	0.000	0.000	
28	1	1.0000	0.0000	0	0.0000	0	1.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
29	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	1.000	1.000	1.000	1.000	
30	1	1.0000	0.0000	0	0.0000	0	1.0000	0	1.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
31	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	
32	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.0000	0.000	0.0000	0.000	0.0000	0.000	0.0000	0.000
33	1	1.0000								

			0	0	0	0	0	0	0	
			0.000	0.000	0.000	0.000	0.000	1.000	0.000	
34	1	1.0000	0.0000	0	0.0000	0	0.0000	0	1.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
35	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
36	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
37	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	1.000	0.000	0.000	1.000	0.000	1.000
38	1	1.0000	0.0000	0	1.0000	0	0.0000	0	1.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000
39	1	1.0000	0.0000	0	0.0000	0	0.0000	0	1.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
40	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
41	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
42	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
43	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
44	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
45	1	1.0000	0.0000	0	0.0000	0	1.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
46	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
48	1	1.0000	1.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
48	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
49	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0

			0.000	0	0.000	0	0.000	0	0.000	0
51	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0	0.000	0	0.000	0	0.000	0
52	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0	0.000	0	0.000	0	0.000	0
53	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0	0.000	0	0.000	0	0.000	0
54	1	1.0000	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0	0.000	0	1.000	0	0.000	0
55	1	1.0000	0.0000	0	0.0000	0	1.0000	0	0.0000	0
			0.000	0	0.000	0	1.000	0	0.000	0
56	1	1.0000	0.0000	0	0.0000	0	1.0000	0	0.0000	0
			0.000	0	0.000	0	1.000	0	0.000	0
57	1	1.0000	0.0000	0	0.0000	0	1.0000	0	0.0000	0
			1.000	0	0.000	0	0.000	0	0.000	0
58	1	1.0000	1.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0	0.000	0	0.000	0	0.000	0
59	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0	0.000	0	9.826	0	0.000	0
60	0	9.8261	0.0000	0	0.0000	0	1.0000	1	0.0000	0
			0.000	0	0.000	0	0.000	0	0.000	0
61	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0	0.000	0	0.000	0	0.000	0
62	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0	0.000	0	0.000	0	0.000	0
63	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0	0.000	0	0.000	0	0.000	0
64	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0	0.000	0	0.000	0	0.000	0
65	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0	0.000	0	0.000	0	0.000	0
66	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.000	0	0.000	0	0.000	0	0.000	0
67	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0
			0.0000	0.000	0.0000	0.000	0.0000	0.000	0.0000	0.000
68	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000	0

			0	0	0	0	0	0	0
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
69	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
70	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
71	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
72	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
73	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
74	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
75	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
76	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
77	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
78	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
79	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
80	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000
			0.000	0.000	0.000	0.000	0.000	0.000	0.000
81	0	9.8261	0.0000	0	0.0000	0	0.0000	0	0.0000
			3	3	1	1	9	18	7
	58	284							

	<b>FEDERAL TEACHING HOSPITAL</b> <b>IDO-EKITI.</b> <b>P.M.B. 201, IDO-EKITI. Tel: 030-251723, 251110</b>	
ERC/2020/01/13/322B	27/01/2020	
Our Ref:.....	Your Ref:.....	Date:.....

**HUMAN RESEARCH AND ETHICS COMMITTEE, FEDERAL TEACHING HOSPITAL,**  
**IDO-EKITI**  
**CLEARANCE CERTIFICATE**

PROTOCOL NUMBER: ERC/2020/01/13/322B

PROJECT TITLE: PREVALENCE AND CORRELATES OF MENTAL DISORDERS AND NUTRITIONAL-PROBLEMS AMONG PRIMARY SCHOOL PUPILS IN IDO-EKITI, NIGERIA.

PRINCIPAL INVESTIGATOR: ABIDAKUN OLUWAYEMISI OLUBUKOLA


DEPT/INSTITUTION: CENTER FOR CHILD AND ADOLESCENT MENTAL HEALTH, UNIVERSITY OF IBADAN, IBADAN, OYO STATE.

DATE CONSIDERED: 13/01/2020                      DECISION OF COMMITTEE: APPROVED

This approval lapse a year after the commencement of the study

CHAIRMAN, HUMAN RESEARCH AND ETHICS COMMITTEE:                      Dr S. M. AGBOOLA

M.B.B.S (ILORIN), FWACP, MPA, MPH  
slmaghoola@yahoo.com

SIGNATURE..........                      DATE..... 27/01/2020 .....


**DECLARATION BY INVESTIGATOR**

PROTOCOL NUMBER :( Please quote in all enquiries/correspondence): ERC/2020/01/13/322B

*To be completed in three copies and returned to the Secretary, Human Research and Ethics Committee of Federal Teaching Hospital, Ido-Ekiti, Ekiti State, Nigeria.*

I fully understand the conditions under which I am authorized to conduct the above mentioned research and I guarantee that I will ensure compliance with these conditions. Should any changes or departure be contemplated from the research procedure as approved, I undertake to re-submit the protocol to the Human Research and Ethics Committee for consideration and approval.

NB: The Committee reserves the right to conduct compliance visit(s) to your research site(s) without prior notifications. The researcher is mandated to inform the Human Research and Ethics Committee when she commences this study.

Signature..........                      Date..... 27/01/2020 .....

Phone Number..... 08036599988 .....

E-mail Address..... dycenny13@yahoo.com .....

## APPENDIX IV

### INFORMED CONSENT

I am a Dr. Abidakun Oluwayemisi, medical doctor in the Department of Mental Health, Federal Teaching Hospital, Ido Ekiti, and also a postgraduate student in the Centre for Child and Adolescent Mental Health (CCAMH), University of Ibadan, Nigeria. I am carrying out a study titled “Prevalence and Correlates of Mental Disorders and Nutritional Problems among Primary School Pupils in Ido-Ekiti”.

I wish and request that you enrol your child as one of the participants in the study. The main aim of this study is to determine the mental health status and nutritional status of pupils in primary schools in Ido Ekiti. This will help in advocacy to emphasize the importance of school-based health programs in primary schools.

I will need to ask your child some questions, please note that all the answers will be kept very confidential. Your child shall be given a number and his/her name shall not be written on the form to avoid any connection with the information he/her gives. During this study, your child will be required to fill a questionnaire containing personal information, the teacher will give details about his/her behaviour in class and with his/her peers, and level of functioning in the classroom. The height and weight shall be measured. The process of this study will only take 15-20mins of his/her time and I shall ensure it does not disturb his/her learning activities in class as it shall be scheduled at their free period or after-school hours.

Consenting to your child's participation is voluntary and he/she can withdraw from the study at any time with no consequences and you can choose not to enrol your child. There will be no financial cooperation as regards participation in the research. If you have further questions concerning the research, please contact the principal investigator:

Abidakun Oluwayemisi.

08036599988

## CONSENT

I -----, after having the study thoroughly explained to me, have been given the opportunity to ask questions, time to consider my child's participation in the study at any time, and the decision to withdraw from the study at any time it so pleases me and my child, I do hereby accept to enrol my child to participate in this study.

Signature-----

Date-----

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## **Fòòmù ilówósí**

### **Ìwe àlàyé pélébé àti fòòmù ilówósí**

O gbodò fún gbogbo ẹni tí n fojúsonà lati kópa ní ìwé pélébé yíí kí wọn ó lè ní àlàyé tí ó tó nípa ìwádíí nàà, kí wọn ó tó ẹ̀ ipinu lati kópa tàbí lati máà kópa.

**Àkórí Ìwádíí:** Ayewo ilera ara pipe ati ilera opolo awon omo ile-iwe akobere ti ilu Ido Ekiti.

**Orúkọ àti ibi tí oluwádíí tí n ʃ'ìṣẹ:** Ilé-Iṣẹ́ tí ó wà fún Ìlera Ọ̀pọ̀lo Ọ̀modé àti Ọ̀jẹ̀wẹ̀wẹ̀, ti Ilé-Ìwòsàn Yunifásitì Ibadan, Nigeria.

**Ète Ìwádíí:** Ìwádíí yíí ní í ẹ̀ pèlú ti awon ile-iwe alakoobere, iwadi lori ilera ara ati ilera opolo awon ile-iwe, bawo lo se ri ati wipe se o ni ibaseepo tabi boya iyaato wa. iriri awon oluko ati awon omo ile-iwe si ounje oofe ti ijoba nfun awon ile-iwe alakoobere.

**Ìlànà Ìwádíí:** Ìwádíí yíí ní nínú lílo ìjíròrò àwọn ẹgbé àtẹ̀numọ̀ pèlú èrò àti gba àwọn idáhùn. Awon omo ile-iwe yoo dahun awon ibere pelu.

**Ewu:** Ìjíròrò ẹgbé àtẹ̀numọ̀ ati idahun ibere nàà yóò gba diẹ̀ nínu àkókò àwọn akeeko.

**Ànfààní:** Ìmò tí ó bá jeyo lati inú ìwádíí yíí yóò wúlò lati ẹ̀ irànlowó fún àgbékalè ona ti yoo ran ijoba lowo ati ile-iwe alakoobere lati tesiwaju lati ri wipe akeeko njeun oofe lojujumo .

**Níní Àṣírí:** Gbogbo àlàyé tí a bá gbà ni á ò fún ní nọmbà kóòdù. A kò ní gba orúko ẹnikéni s'ìlè tàbí lò ó nínu atejade tàbí ìjábò lati inú ìwádíí yíí. Àkọ̀sílẹ̀ tí a bá gbà jọ ni a kò ní lè so mó ẹnikéni.

**Títí inú wá:** Kíkópa ẹ̀ nínu ìṣẹ̀ ìwádíí yíí jẹ̀ èyí ti o ti inú ẹ̀ wá pátápátá.

**Àwọn ọ̀nà mûrán sí kíkópa:** Bí ìwó bá yàn lati ma kópa, eleyi kì yóò fa ijiya kankan rara.

**Fífàséyìn nínu ìwádíí:** Ìwọ̀ le yàn lati fàséyìn kúrò nínu ìwádíí yíí ní ìgbàkugbà; a kò ní paá ní dandan fún ọ̀ lati ẹ̀ àlàyé bí ìwọ̀ bá yàn lati ẹ̀ eléyíí.

**Àtunbòtán Fífàséyìn:** Ki yóò sí àtunbòtán kankan, pípádánù ànfààní tàbí itójú bí iwọ̀ bá yàn lati fàséyìn kúrò nínu ìwádíí yíí. Jòwọ̀ kiyèsi wípé àwọn àlàyé tí a gbà l'ówó ẹ̀ láì gba idánimò kankan (fún àpẹ̀rẹ̀, orúkọ re) kí o tó yàn lati fàséyìn ni a lè ti ọ̀ àtúnṣe sí, tàbí lò nínu àwọn ìjábò àti atejade wa. A ẹ̀ ìlérí láti ẹ̀ akitiyan pèlú inú rere láti wa ni ìbámu pèlú àwọn ohun ti

o fẹ ni bí o bá ti šéé še.

**Koriya: A o fun o ni oun ikowe**

**Òrọ ẹnì tí ó n gba lílówó sí:**

Èmi ti še àlàyé nípa ìwádíí yíí fún akeeko yi ati obi re, mo sì ti pèsè àlàyé tí ó tó, àti pèlú àwọn ewu àti àwọn ànfààní, láti lè še ìpinnu tí ó tó.

ÓJÓ: \_\_\_\_\_ ÌBUWÓLÙ: \_\_\_\_\_

ORÚKỌ: \_\_\_\_\_

**Òrọ ẹnì tí ó n jẹrì sí lílówó sí (Ìlànà fún olùkópa tí ó jé púrùntù)**

Èmi.....(orúko olùjẹ̀rì) f'ídíí rẹ̀ mú'lè wípé àlàyé tí a fún..... (orúko olùkópa) ní ède abíníbí, jé àfihàn tòótó fún ohun tí mo ti kà nínù ìwé àlàyé pélébé tí a so mó èyí.

Ìbuwólù olùjẹ̀rì (lòó bí olùkópa bá jé púrùntù):.....

Ìbuwólù ìyá (lòó bí olùkópa kò bá tó ọmọ ọdún méjìdínlógún):.....

Orúko Ìyá.....tabi

Oruko Baba:.....

**Àlàyé fún kíkànsí:** Bí iwó bá ní àwọn èdùn kankan tàbí bí o bá nílò alaaye kikun, kan si oludari eko yi.

## APPENDIX V

### ASSENT FORM NO-----

I am Dr. Abidakun Oluwayemis, a medical doctor in the Department of Mental Health, Federal Teaching Hospital, Ido Ekiti and also a postgraduate student in the Centre for Child and Adolescent Mental Health (CCAMH), University of Ibadan, Nigeria. I am carrying out a study titled “Prevalence and Correlates of Mental Disorders and Nutritional Problems among Primary School pupils in Ido Ekiti, Nigeria.”.

I wish and request that you enrol to take part in the study I want to do in your school to find out about the school food you eat daily and the level of functioning at school. I will be asking for information about yourself, family and also about you behave in school and your relationship with friends. All the information you give me will be safe with us and your name will not be used so that no one will know it's you. I will be measuring your weight and height to calculate your body size if it is okay for your age.

The benefit of this study is to identify any area of difficulty and refer to a doctor for care. There is no harm that will come to you with this study and it won't disturb your learning in class. You are free to decide to take part in the study or not and can also withdraw at any time with no punishment.

#### ASSENT:

I -----, after having been told in details the reason and advantage of the research, with the opportunity to think very well to consider whether to do or not. I hereby volunteer to participate in the study.

## APPENDIX VI

### STUDY INSTRUMENTS:

SDQ- English and translated (Yoruba) SDQ

SCHOOL HEALTH SOCIODEMOGRAPHIC QUESTIONNAIRE

KSADS

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## Strengths and Difficulties Questionnaire

S 11-17

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.

Your Name .....

Male/Female

Date of Birth.....

	Not True	Somewhat True	Certainly True
I try to be nice to other people. I care about their feelings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am restless, I cannot stay still for long	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I get a lot of headaches, stomach-aches or sickness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I usually share with others (food, games, pens etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I get very angry and often lose my temper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am usually on my own. I generally play alone or keep to myself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I usually do as I am told	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I worry a lot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am helpful if someone is hurt, upset or feeling ill	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am constantly fidgeting or squirming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have one good friend or more	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I fight a lot. I can make other people do what I want	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am often unhappy, down-hearted or tearful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other people my age generally like me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am easily distracted, I find it difficult to concentrate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am nervous in new situations. I easily lose confidence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am kind to younger children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am often accused of lying or cheating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other children or young people pick on me or bully me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I often volunteer to help others (parents, teachers, children)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I think before I do things	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I take things that are not mine from home, school or elsewhere	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I get on better with adults than with people my own age	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have many fears, I am easily scared	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I finish the work I'm doing. My attention is good	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you have any other comments or concerns?

**Please turn over - there are a few more questions on the other side**

Overall, do you think that you have difficulties in one or more of the following areas: emotions, concentration, behaviour or being able to get on with other people?

No	Yes- minor difficulties	Yes- definite difficulties	Yes- severe difficulties
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you have answered "Yes", please answer the following questions about these difficulties:

- How long have these difficulties been present?

Less than a month	1-5 months	6-12 months	Over a year
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Do the difficulties upset or distress you?

Not at all	Only a little	Quite a lot	A great deal
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Do the difficulties interfere with your everyday life in the following areas?

	Not at all	Only a little	Quite a lot	A great deal
HOME LIFE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FRIENDSHIPS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CLASSROOM LEARNING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LEISURE ACTIVITIES	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Do the difficulties make it harder for those around you (family, friends, teachers, etc.)?

Not at all	Only a little	Quite a lot	A great deal
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Your Signature .....

Today's Date .....

**Thank you very much for your help**

## Strengths and Difficulties Questionnaire

T 4-17

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 the child's behaviour over the last six months or this school year.

Child's Name .....

Male/Female

Date of Birth.....

	Not True	Somewhat True	Certainly True
Considerate of other people's feelings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Restless, overactive, cannot stay still for long	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Often complains of headaches, stomach-aches or sickness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shares readily with other children (treats, toys, pencils etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Often has temper tantrums or hot tempers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rather solitary, tends to play alone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Generally obedient, usually does what adults request	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Many worries, often seems worried	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Helpful if someone is hurt, upset or feeling ill	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Constantly fidgeting or squirming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has at least one good friend	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Often fights with other children or bullies them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Often unhappy, down-hearted or tearful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Generally liked by other children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Easily distracted, concentration wanders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nervous or clingy in new situations, easily loses confidence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kind to younger children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Often lies or cheats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Picked on or bullied by other children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Often volunteers to help others (parents, teachers, other children)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Thinks things out before acting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Steals from home, school or elsewhere	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gets on better with adults than with other children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Many fears, easily scared	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sees tasks through to the end, good attention span	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you have any other comments or concerns?

**Please turn over - there are a few more questions on the other side**

Overall, do you think that this child has difficulties in one or more of the following areas: emotions, concentration, behaviour or being able to get on with other people?

No	Yes- minor difficulties	Yes- definite difficulties	Yes- severe difficulties
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you have answered "Yes", please answer the following questions about these difficulties:

- How long have these difficulties been present?

Less than a month	1-5 months	6-12 months	Over a year
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Do the difficulties upset or distress the child?

Not at all	Only a little	Quite a lot	A great deal
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Do the difficulties interfere with the child's everyday life in the following areas?

	Not at all	Only a little	Quite a lot	A great deal
PEER RELATIONSHIPS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CLASSROOM LEARNING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Do the difficulties put a burden on you or the class as a whole?

Not at all	Only a little	Quite a lot	A great deal
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Signature .....

Date .....

Class Teacher/Form Tutor/Head of Year/Other (please specify:)



Ìwé ìfòrò-wàní-lènù-wò nípa Agbára àti ìyòro ɔ̀nì (SDQ-YOR) OL 4-16

Fún ibeèrè kòòkan jòwò fagi sí eyíkéyí nínú àwòn àpótí fún idáhùn “Kífye òtò”, “Òtò níwònba”, “Dájú-dájú òtò ní”. Yoo ràn wá lówò tí ó bá lè dáhùn gbogbo àwòn ibeèrè wònyí dádára kòdà bí ó tì lè jẹ wí pé kò da ò lójú tàbí ibeèrè náà kò yé ò. Jòwò fún wa ní idáhùn nípa gbìgbà ìhùwàsí òmò yín làárín oyù mēfà sēhin tàbí nínú òdun ikççkò tí ó wà yíí.

Orúkò òmò .....	Òkùnṛín/Obìnrin			
Òjò ìbí.....	òtò	níwònba	Kífye òtò ní	Dájú-dájú
Ó máa n gba ìmòlára èlòmíran rò			<input type="checkbox"/>	
<input type="checkbox"/> <input type="checkbox"/> Ó máa n yáifára-balé, ara líle jù, ko lè duró lójú kan fún igbà pípè			<input type="checkbox"/>	
<input type="checkbox"/> <input type="checkbox"/> Ó máa n yàrdèyè nípa ori-fifò, inú rirùn tàbí éébi lópò igbà (yèré, pénsùrù, ipápánu)			<input type="checkbox"/>	
<input type="checkbox"/> <input type="checkbox"/> Ó gbárádí látí yè àjòpín nýkan pèlú àwòn òmò mírán (nýkan bii nýkan)			<input type="checkbox"/>	
<input type="checkbox"/> <input type="checkbox"/>				
Ó máa n ní ìrunú tàbí inúfùfù lópò igbà			<input type="checkbox"/>	
<input type="checkbox"/> <input type="checkbox"/>				
Ó máa n dá wà ó sí n sáábà dá yèré			<input type="checkbox"/>	
<input type="checkbox"/> <input type="checkbox"/>				
Lápapò ó jẹ òmò tí ó ní igbòrán, ó sí máa n sáábà yè òhún tí àgbalàgba bá ràn ó				<input type="checkbox"/>
<input type="checkbox"/> <input type="checkbox"/>				
Òpò àníyàn; bí ɔ̀nì tí ó ní àníyàn lópò igbà			<input type="checkbox"/>	
<input type="checkbox"/> <input type="checkbox"/>				
Ó máa n yè ìrànłowò tí ɔ̀nì kan báa yèyè, daamú tàbí ní àìléra			<input type="checkbox"/>	
<input type="checkbox"/> <input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
Ó máa n mi ara nígbà gbogbo, bí ó tile jẹ wí pé ó wà ní ìjokòó (bii kí ó máa ju ɔ̀sç. kí ó máa mi òwò àti kí ó máa yí ara síhìn-ín sòhùn-ùn)				
Ó ní o kéré tan òrè tímòtímò kan			<input type="checkbox"/>	<input type="checkbox"/>
Ó máa n bá àwòn òmò yòókú jà tàbí mōmō fiyà jẹ wòn lópò igbà			<input type="checkbox"/>	
<input type="checkbox"/> <input type="checkbox"/> Ó máa n ni àidùnnú, ìrèwèsì-òkàn tàbí kí omijé lé sójú rē lópò igbà			<input type="checkbox"/>	
<input type="checkbox"/> <input type="checkbox"/> Lákòpò gbogbo àwòn òmò yòóku ló fèrán rē			<input type="checkbox"/>	
<input type="checkbox"/> <input type="checkbox"/>				
Òkàn rē máa n tètè kúrò nínú nkàn tí ó bá n yè ó sí yòro fun látí fi òkàn sí nýkan			<input type="checkbox"/>	<input type="checkbox"/>
Ó máa n ní ibèrù-bòjò tàbí kí ó má so mō àwòn tí ó bá mō níkan nígbà tí ó bá wà ní agbègbè tuntun. Ó tètè máa n yè aíní-idára-ɔ̀nì-lojú nínú ara rē			<input type="checkbox"/>	<input type="checkbox"/>
Ó máa n páwò tàbí yàn èlòmíran jẹ lópò igbà			<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> <input type="checkbox"/>				

Lápapò, njè o rò wípe òmò yí ní fýdò kankan ní ònà kan tàbí jù bē lō nínú àwòn ònà wōnyí? Ìmí-édùn, ìfòkànsí, ìhùwàsí tàbí níní ìbáyépò tí ó gún menrán pèlú àwòn ènìyàn.

Rárá	Bèè ni fýdò níwónba	Bèè ni fýdò púpò	Bèè ni fýdò púpò gan-an
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Tí o bá dáhùn “bèè ni”, jōwò dáhùn àwòn ìbèèrè yí nípá fýdò wōnyì:

- Ó tó ìgbà wo tí àwòn fýdò wōnyí ti bēè?

Kò tó oyù kan	Oyù kan sí mārùn-ún	Oyù mēfà sí mējlá	Ó jù òdún kan
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Njè fýdò wōnyí n da òmò yí láàmú tàbí ó n bà a nínú jē?

Rárá kò rí bēè	Dìè nìkan	Púpò gán-an	Púpò gidi gán-an
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Njè fýdò wōnyí ní ipá lorí ìgbésí ayé ojojúmò òmò yí ní àwòn ònà wōnyí?

	Rárá kò rí bēè	Dìè nìkan	Púpò gán-an	Púpò gidi gán-an
Ìbásépò pèlú àwòn çlègbè rç	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Èkò ni iyàrá ìkōwèé	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Njè fýdò wōnyí n fún ò ni fýdò tàbí o ni fýdò lorí àwòn òmò ti o wa ni iyàrá ìkōwèé lápapò?

Rárá kò rí bēè	Dìè nìkan	Púpò gán-an	Púpò gidi gán-an
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Ifòwòsí .....

Òjò òní .....

Olùkò/Olorí ipele kan/Olorí òdun kan/ Çlòmíràn (Dárúkò)

Ç yé púpò fún ìrànlōwò yín

©RobertGoodman, 2005

Serial Number: \_\_\_ \_\_\_ \_\_\_

Today's Date: \_\_\_ \_\_\_ / \_\_\_ \_\_\_ / \_\_\_ \_\_\_

## SCHOOL HEALTH QUESTIONNAIRE IN ENGLISH & YORUBA

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.

Jọwọ kọ idahun si awọn ibeere ti o jẹ mọ ọ, tabi ki o fa igi si abẹ eyi to o jẹ mọ ọ. Eleyii kii ẹ idanwo; a kan fẹ mọ nipa rẹ ati ilera rẹ ni.

### SECTION I

#### Personal Information

1. Name of School (1. Orukọ ile-iwe):

2. Class (2. Kilaasi):

3. Where do you live? (Address of Present Abode):

3. Nibo ni o n gbe? (Ibugbe):

4. What is your date of birth? Date of Birth: \_\_\_\_\_

4. Kini oṣọ ibi rẹ? Oṣọ ibi: Day Month Year  
oṣọ oṣu oṣun

5. How old are you? 5. Oṣọ oṣun melo ni ọ? \_\_\_\_\_

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

6. Ẹ ọkunrin tabi obinrin? (a) Ọkunrin (b) Obinrin

7. Do you practise any religion? No Yes

7. Njẹ ẹ manse ẹsin kankan? Bẹkọ Bẹni

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

8. Kọ ibi ti o ti maa njọsin -----

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

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

9. Bawo ni igbagbo re se nto ihuwasi re?

- (a) Very much (b) much (c) Just a little (d) Not at all  
(a) O nto o gan an (b) O nto o (c) O nto o die (d) Ko to o rara

10. How much does the teaching of your religion guide your family life?

10. Bawo ni esin naa se se pataki to ni ebi e?

- (a) Very much (b) much (c) Just a little (d) Not at all  
(a) O se pataki gan-an (b) O se pataki (c) O se pataki die (d) Ko se pataki

### Family Information

11. Family Type:

11. Iru ebi:

- (a) Monogamous (b) Polygamous  
(a) Oniyawo kan (b) Oniyawo meji tabi ju bejo

12. Number of Mother's Children:

12. Omọ melo ni Iya re ni?:

13. Number of Father's Children:

13. Omọ melo ni Baba re ni?:

14. What is your position among your father's children?

14. Ipo wo lo wa ninu awon omọ baba re?

15. What is your position among your mother's children?

15. Ipo wo lo wa ninu awon omọ iya re?

16. Marital Status of Parents:

16. Ibagbepo awon obi re:

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

(a) Se won gbe po? (b) Se won ti ko ra won silẹ? (c) Baba ti ku (d) Iya ti ku (e) Iya ati Baba ti ku

17. How many husbands has your mother had?

17. Oko melo ni Iya re ti ni ri?

18. Who do you live with presently?

18. Tani o n gbe pelu lowolowo?

(a) Parents (b) Mother (c) Father (d) Grandparents (e) Grandmother

(a) Awon obi (b) Iya nikan (c) Baba nikan (d) Iya ati Baba Agba (e) Iya Agba nikan

(f) Grandfather (g) Other [please specify] \_\_\_\_\_

(f) Baba Agba nikan (g) Awon Iyoku [Jowo so nipato] \_\_\_\_\_

19. Who brought you up from your childhood?

19. Talo to e dagba lati kekere?

(a) Parents (b) Mother (c) Father (d) Grandparents (e) Grandmother

(a) Awon obi (b) Iya nikan (c) Baba nikan (d) Iya ati Baba Agba (e) Iya Agba nikan

(f) Grandfather (g) Other [please specify] \_\_\_\_\_

(f) Baba Agba nikan (g) Awon Iyoku [Jowo so nipato] \_\_\_\_\_

20. How many different people have you left your parents to live with from your childhood? \_\_\_\_\_

20. Awon eniyan ototo melo ni o fi awon obi re silẹ lati lo gbe pelu won? \_\_\_\_\_

21. If more than one person, list the people, time spent and whether experience was good or bad?

21. Ti o ba ju enikan lo, ka won, akoko ti o lo lodu enikokan ati bi o ba dara tabi ko dara?

Person lived with From which age to which age Experience (good or bad)

Eni ti o ba gbe Omọ odun melo ni o nigba naa Iriri re nibe (O dara tabi ko dara)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

22. Do you do any kind of work to earn money before or after school? Yes No

22. Njẹ o maa nṣiṣe lati ri owo lehin tabi saaju ki o to lo si ile iwe? (Beṅi tabi beṅko)

23. If yes, please describe what you do \_\_\_\_\_

23. Ti o ba je beṅi, ṣe alaayeohun ti o ṣe \_\_\_\_\_

24. Level of Father's Education

24. Iwe melo ni baba re ka?

(a) No Formal Education (b) Koranic School (c) Primary School (d) Secondary School

(a) Ko kawe rara (b) Ile-keu (c) Ile-Iwe Alakobere (d) Ile iwe girama

(e) Post Secondary (Non-University) (f) University Degree and above (e) I do not know

(e) Ile-iwe agba (Yato fun yunifasiti) (f) Yunifasiti ati ju beṅ lo (e) Nko mo

25. Occupation of Father: [Write the exact occupation] \_\_\_\_\_/ I do not know

25. Iṣe wo ni Baba re n se: [Ko iṣe ti won nse pato lekunreṅ] \_\_\_\_\_/Nko mo

26. Level of Mother's Education

(a) No Formal Education (b) Koranic School (c) Primary School (d) Secondary School

(a) Ko kawe rara (b) Ile-keu (c) Ile-Iwe Alakobere (d) Ile iwe girama

(e) Post Secondary (Non-University) (f) University Degree and above (e) I do not know

(e) Ile-iwe agba (Yato fun yunifasiti) (f) Yunifasiti ati ju beṅ lo (e) Nko mo

27. Occupation of Mother: [Write in the exact occupation] \_\_\_\_\_/ I do not know

27. Iṣe wo ni iya re nse: [Ko iṣe ti won nse pato lekunreṅ] \_\_\_\_\_

28. Do you like your family? Yes No

28. Se o fẹran ebi re? Beṅi/Beṅko

29a. If Yes, Why? \_\_\_\_\_

29a. Beṅi, Se alaye? \_\_\_\_\_

29b. If No, Why? \_\_\_\_\_

29b. Bẹ̀kọ, Ẹ̀e alaye? \_\_\_\_\_

### School-Related Questions

30. Do you like your school? Yes/ No

30. Ẹ̀e o fẹ́ran ile-iwe rẹ? Bẹ̀ni / Bẹ̀kọ

31. What term did you start in this school?

31. nìgba wo laarin odun lo beree ile-iwe yi?

(a) first term (b) second term (c) third term

32. What class did you start in this school?

32. kilaasi wo lo beera ni ile-iwe yi?

(a) pry 1 (b) pry 2 (c) pry 3

33. How many children are there in your class? \_\_\_\_\_

33. Akẹ̀kọọ melo ni o wa ni kilaasi rẹ? \_\_\_\_\_

34. Do you do well academically? Yes No

34. Njẹ o nṣe daada ninu ẹ̀kọ rẹ? Bẹ̀ni/ Bẹ̀kọ

35a. If Yes, explain \_\_\_\_\_

35a. Bẹ̀ni, Ẹ̀e alaye \_\_\_\_\_

35b. If No, explain \_\_\_\_\_

35b. Bẹ̀kọ, Ẹ̀e alaye \_\_\_\_\_

36. What is the overall percentage of your last term exams?

36. kini aropo ayeyori idanwo to se ni saa to koja?

(a) 0-39% (b) 40-69% (c) 70-100%

37. Are you having difficulties with your teachers? Yes No

37. Njẹ o ni iṣoro kankan pelu awon oluko re? Beeni Beeko

38.If yes, what sort of difficulties? \_\_\_\_\_

38.Ti o ba je beeni, iru iṣoro wo ni? \_\_\_\_\_

39. Do you have guidance counsellors in your school? Yes No

39. Njẹ e ni awon Oludamoran Atonisona ni ile-eko re? Beeni Beeko

40. Have you ever gone to see them? Yes No

40. Njẹ o ti lo sodo won ri? Beeni Beeko

41.If yes, what did you go to see them for? \_\_\_\_\_

41.Ti o ba je beeni, ki ni o lo ri won fun? \_\_\_\_\_

42. If you have a problem at school,would you go to guidance counsellor for help?Yes No

42. Ti o ba ni idamu ni Ile-eko, nje iwọ o lo ri Oludamoran Atonisona? Beeni Beeko

43a. If yes, why would you go?

43a. Beeni, Se alaye \_\_\_\_\_

43b. If no, why not?

43b.Beeko, Se alaye \_\_\_\_\_

## SECTION II: QUESTIONS ABOUT SCHOOL FEEDING PROGRAM IN YOUR SCHOOL

1. Is your school on school feeding program? Yes No

Se ile-iwe re njanfani ounjẹ ofe ti ijoba?

2. If yes, when did your school start?

To ba jebe, lati igba wo?

(a) 0-3 months (b) 3-6months (c) 6-9months (d) 9-12months

3. How many terms have you benefitted on the school feeding program?

Lati igbawo lo ti nbawon jeun ounjẹ oofe ijoba?

(a) one term (b) two terms (c) three terms

4. .How regular is it? Se ounjẹ naa nse deede? Regular irregular

5. How many portion of food per pupil?



- iwon sibi meelo ni ounje naa fun omo ile-iwe kan?
- (a) 1-2 spoons                      (b) 2-3 spoons                      (c) 3-4 spoons                      (d) 4-5 spoons
6. Do you like the food? Yes      No  
Se o feran ounje naa?
7. Is it enough? Yes      No  
Se ounje naa to o je?
8. Is it served with fruits?              Yes      No  
Se ounje naa wa pelu esoo jije?
9. If yes, please specify types of fruits-----
10. Do you eat breakfast to school?  
Se o ma nje ounje aaro ko to wa si ile-iwe?  
(a) Daily   (b) 1-2 times   (c) 3-4 times   (d) 4-5 times per week

SECTION III: ARTHROPOMETRIC MEASUREMENT

WEIGHT- -----(kg)

HEIGHT----- (m), (Height<sup>2</sup>= )

BMI----- (Kg/m<sup>2</sup>)

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KIDDIE SCHEDULE FOR AFFECTIVE DISORDERS AND SCHIZOPHRENIA  
QUESTIONNAIRE - SCREENING AND SUPPLEMENTAL INTERVIEW

\*\*\* DIAGNOSTIC SUPPLEMENT PART WAS USED TO INTERVIEW PARENT AND CHILD IN THIS STUDY.

\*\*THREE SUPPLEMENTS USED WERE:

- 1 Depressive & Bipolar related disorders
- 2 Anxiety, Obsessive-Compulsive and Trauma related disorders supplement
- 3 Neurodevelopmental, Disruptive and Conduct disorders supplement
- 4 Schizophrenia spectrum and other psychotic supplements

# K-SADS-PL DSM-5

## November 2016

*Includes:*

**A. Screen Interview**

**B. Supplements**

- I. Depressive and Bipolar Related Disorders Supplement
- II. Schizophrenia Spectrum and Other Psychotic Disorders Supplement
- III. Anxiety, Obsessive-Compulsive, and Trauma-Related Disorders Supplement
- IV. Neurodevelopmental, Disruptive, and Conduct Disorders Supplement
- V. Eating Disorders and Substance-Related Disorders Supplement

Advanced Center for Intervention and Services Research (ACISR)  
for Early Onset Mood and Anxiety Disorders  
Western Psychiatric Institute and Clinic

Child and Adolescent Research and Education (CARE)  
Program, Yale University

Subject

Date

 /  / 20

Interviewer

Draft

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## November 2016

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Draft

