FAMILY CHARACTERISTICS AND PSYCHOSOCIAL CORRELATES OF DEVELOPMENTAL DELAY AMONG UNDER-FIVE CHILDREN IN TWO COMMUNITIES IN LAGOS

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MATRICULATION NUMBER: 189629

A Project Submitted to the Centre for Child and Adolescent Mental Health (CCAMH), in partial fulfilment of the requirements for the degree of Master of Science in Child & Adolescent Mental Health (MSc. CAMH) of the University of Ibadan.

OCTOBER, 2016

DECLARATION

I hereby declare that this research project titled **"Family Characteristics and Psychosocial Correlates of Developmental Delay among Under-five Children in Two Communities in Lagos"** is written by me and has not been submitted either wholly or in part to any other institution for the award of another degree or diploma.

The research project is submitted in partial fulfilment of the requirements for the award of Master of Science in Child and Adolescent Mental Health of the University of Ibadan.

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CERTIFICATION

This is to certify that this project was written by ENISAN CATHERINE NGOZI of the Centre for Child and Adolescent Mental Health, University of Ibadan under my supervision. This research project has been read and approved as part of the requirement for the award of Master of Science Degree (M.Sc).

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DEDICATION

I dedicate this work to the Almighty God who secured my life as I shuttle between Lagos and Ibadan and enabled me to commence and finish this programme despite all odds.

ACKNOWLEDGEMENT

I thank the Most High God whose grace enabled me to do this project.

I highly appreciate my supervisors Dr. Bello- Mojeed, Dr. Adeniyi and Prof. Omigbodun whose expert guidance and unwavering support and patience saw to the success of this work.

I am profoundly and specially grateful to my supervisor, Dr. Bello- Mojeed M.A, who patiently and unrelentlyprodded me on, even when I thought I could not go any further. You are much more than my supervisor. Thank you. I highly appreciate your outstanding expertise, time, resources and effort to the completion of this work. I am particularly grateful to my wonderful role model, the director and principal investigator of the Centre for Child and Adolescent Mental Health, Prof. Olayinka Omigbodun for her tireless efforts to see every one of us empowered.

I thank all my lecturers at the Centre who invested so much to see to this project's success directly or indirectly. You have influenced my life in no small measure. I am especially grateful to Dr. Akinyemi who, out of his busy schedule, read through the methodology and guided me through. I thank all my CCAMH colleagues, the time we spent together is worthwhile and enriching. To my lively class captain, Dr. Haleem, I am grateful.

I am deeply grateful to a respectable and distinguished icon, the head of Child and Adolescent Mental Health Services of FNPH (Oshodi Annex), Dr. Ogun. She unreservedly and whole heartedly created an enabling and stimulating environment for me at the Centre for my industrial training. Through this industrial attachment, I came in contact with my hero, role model and supervisor, Dr. Bello- Mojeed M.A. I am highly honoured to have her supervised my MSc. CAMH project. I thank Dr. Ijarogbe, for her counsel. I appreciate all the doctors, Nurses, Psychologists and other staff of the Centre for the unity and opportunities to learn.

I thank the Medical Officer of Health (MOH) at Oshodi LCDA Secretariat, Dr. Shotunde for her quick intervention in obtaining permission for this study. I also thank all the staff at the secretariat for their support. Also worthy of mention is the head of Primary Health Care Centre at Ajibulu, Mrs. Omueti for her kind assistance.

I am highly grateful to my outstanding hero, the Assistant Director of Nursing Services (ADNS) at LASUTH Mrs. M. Shode for her motherly advice and guidance. I thank my friends and colleagues at LASUTH and Isolo General Hospital, the Apex Nursing Officer at Isolo General Hospital, Mrs. Agunbiade, Dr. Obim, the Chief Nursing Officers, CNO Otunla, and Senior Matron Ojajuni.

I am also grateful to my ever- supportive Daddy and friend, Pastor Dedenuola and family for financial and spiritual support. I thank my very hospitable friend and short time landlady at Ibadan, Miss. Edikan, Special thanks to my wonderful research assistants, Yetunde, Ikechukwu, Pastor Olukoya for their contributions to the success of this work. I am grateful to my tireless and highly cooperative data analyst, Mr Fashola Timi. I also appreciate the outstanding analysis of my study data done by my supervisor, Dr Bello-Mojeed M.A.

I am sincerely grateful to my family, my wonderful husband, Pastor S.A Enisan. My lovely boys Ikechukwu and Nnamdi for their unparalleled support, encouragement and endurance during the period of my MSc programme. I love you all.

Lastly, I am grateful to all my study participants.

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KEY TO ABBREVIATIONS

ASQ	-	Ages and Stages Questionnaire
DD	-	Developmental Delay
LCDA	-	Local Council Development Area
LGA	-	Local Government Area
OSLO	-	Oslo Social Scale
PHQ	-	Patient Health Questionnaire
SF-8	-	Short Form Questionnaire

ABSTRACT

Background: Developmental delay is a term used for children who lacked developmental features and skills in developmental task expected for the children of their age.

Research findings indicate that 200 Million children in sub Saharan African are developmentally delayed in one area or the other. This delay often leads to poor school readiness, poor educational attainment, lack of job opportunities and intergenerational poverty and backwardness. Factors associated with this condition are of concern, some are genetically determined while some are as a result of psychosocial and family living conditions which can be modified. In as much as health and social facilities for identification and management of this condition are not readily available in low and middle-income country like Nigeria, the best approach will be to identify these modifiable factors that are associated with the developmental delay with the aim of preventing them.

Though research has shown that some family characteristics and psycho social factors are associated with developmental delay, very few studies have assessed these factors in Nigeria

OBJECTIVE

This study aimed to determine the family characteristics and psychosocial factors associated with developmental delay in children under the age of five years in Lagos, Nigeria.

METHODOLOGY

In a cross sectional study design, 501 apparently normal children aged five years and below, with their primary care givers were recruited from Afariogun and Oluyeye communities in Oshodi LCDA, Lagos.

Four hundred and eighty-six (486) were valid for analysis yielding 97% response rate. Instruments used for data collection were: Socio Demographic Questionnaire for demographic data information for the children and their primary caregivers..

Ages and Stages Questionnaire (ASQ) – for determining developmental delay in the children. Patient Health Questionnaire (PHQ-9), Oslo Social Support Scales (Oslo-3), and Short form Questionnaire (SF-8) for psycho social characteristics of the caregivers.

Data was analyzed using Statistical Package for Social Sciences (SPSS), version 20. Percentages and figures were used for socio demographic characteristics of the children and their caregivers. Chi Square was used for associations between family characteristics, psychosocial factors and developmental delay. Level of significance was 0.05.

RESULTS

Ages of the children ranged from 1.5 months to 60 months with a mean of 27.8 ± 13.3months, their gestational ages at birth ranged from 7 to 10 months with a mean of 8.9±0.32months.

The ages of the care givers ranged from 20 to 45 years with a mean of 30.6 ± 7.01 years. The prevalence of developmental delay in the studied children was found to be 23%.

Child's socio-demographic characteristics found to be significantly associated with developmental delay were: Male gender (p= 0.001), pre-term birth (p= 0.045), middle birth order (p= 0.001)and having a child being cared for by non-parent (p=0.010).

The family characteristics and psychosocial factors found to have significant association with developmental delay were increasing age of caregiver (p<0.001), being married (p=0.001), living in overcrowding environment (p=0.003), maternal depression (p=0.001) and poor social support (p<0.001).

CONCLUSION

The findings of this study showed that developmental delay is prevalent in children under the age of five years in the study communities in Lagos State. Secondly, it showed that family characteristics have significant association with development delay in the children. Thirdly, this study concludes that of the psycho-social factors studied, maternal depression and poor social

support tend to be significantly associated with developmental delay. Child development could be influenced by the synergistic effects of the family, environment, social structures, interactive bonding and emotional nurturance from caregivers which work to nurture proper child development. Addressing family characteristics and psychosocial factors associated with developmental delay should be an integral component of promotional and preventive measures aimed at improving child development in Nigeria.

KEY WORDS

Child development, under-five children, developmental delay, family characteristics and psycho-social factors.

CHAPTER ONE

INTRODUCTION

1.1 Background

The future of human societies depends on children being able to achieve their optimal physical and psychological development. The development of a child is a dynamic process that utilizes the potential of the baby to achieve optimal development within the context of available environment (Rimal et al., 2008). Child development refers to the biological, psychological and social changes that occur in human beings from conception to adolescence, as the individual progresses from dependency to increasing autonomy (Davies, 2004). Mussen et al., (2001) defined development as systematic, long lasting changes in physical, neurological, cognitive and behavioural structures. Throughout the world, there are growing concerns about any form of delay in the attainment of developmental, cognitive, social and emotional wellbeing of the children.

Developmental delay (DD) is a term used for children who lack developmental features and skills in the language, cognitive, motor and social/personal adaptation developmental areas that would be expected of children of their age (Peter et al., 1998). Though, there is a wide variation with limit to what is considered normal across culture, every child has a unique developmental pattern outside of which is considered to be a delay. Single domain developmental delay is a delay in any one of the five developmental domains, whereas Global developmental delay in early childhood is defined as a significant delay in two or more areas of the five main developmental domains: gross motor skills, fine motor skills, speech and language,

social/ personal and problem-solving / cognition (Bellman et al., 2013; Poon et al., 2010).

1.1.2 Problem Statement

According to the World Health Organization, about 5% of children world-wide of 14-year-olds and under have a moderate to severe developmental disability, and up to 15% of children under 5-year-old are developmentally delayed,85% of them in developing countries (Silberberg, 2001). Engle et al (2010) estimated that more than 200 million children under 5 years of age in developing countries do not reach their developmental potential.

Statistics Canada Report (2001) stated that developmental delay is the most common disability in children aged 0 to 4 years in Canada, with 1.1% experiencing developmental delay (Cossette, 2002). In India, Rimal et al. (2008), found a prevalence of 22% in speech and language delay and 11.8% global developmental delay among 85 children less than 6 years old in Nobel Medical College Hospital (Rimal, et al., 2008). Nguefack et al. (2013) found hospital prevalence of developmental delay of 7.0% of all admissions in the child neurology unit in Cameroun and estimated prevalence to be 51.7% of all consultation with Denver Developmental Screening Test. Using Ages and Stages Questionnaire (ASQ), Oguntoyinbo (2014) reported a prevalence rate of 26.4% in under-five children in two rural communities in Ota, Ogun State.

Diverse factors interact in the background of multiple contexts which could invariably influence delay in children's physical, social, emotional, and cognitive development (Baltes et al., 1980; James & Prout, 1997; Bornstein, 2009; Cole & Packer, 2011). Aside genetic inheritance, family characteristics and psychosocial factors have been

observed to be associated with developmental delay in children. Some of the family characteristics reported from studies to influence a delay in the development of a child include large family size, family structure, single parenting, low parental education and unemployment (Willms, 2002).

Closely linked with family characteristics is the role of psychosocial variables in the appearance of developmental delay in children during their formative years. Sameroff, (1998) found out that parental literacy/education and occupation affects children's cognitive development, as well as the amount and quality of time a mother spend with the children and the available income. Income influences the immediate family ability to provide for the basic needs of the members, including young children. Extreme poverty creates conditions in which all adults in the family must work outside the home (World Bank), usually for a long period thereby denying the child the needed care and stimulation.

1.1.3 Justification

The burden of impaired child development is huge. The first few years of life are particularly important because vital development occurs in all domains (Black et al., 1998). The brain develops rapidly with series of complex events. Any problem or developmental delay processes can have long-term effects on the brain. Brain development is modified by the quality of the environment. Previous studies have shown that early under-nutrition, iron-deficiency, environmental toxins, stress, and poor stimulation and social interaction can affect brain structure and function, and have lasting cognitive and emotional effects (Black et al., 1998; Liu et al., 2000; Meaney, 2001; Web et al, 2001; Rodier, 2004).

Although many children have delays in language or other areas, less than a half are identified before starting school (Dearlove & Kearney, 1999). In Great Britain, only

45–55% of children with developmental disabilities are detected before school entrance (Glascoe, 2000). This denotes the high proportion of children that are missed out during screening, particularly higher in developing countries than the developed countries. These missed opportunities increase the level of dependence and disability of an individual and decrease the productivity of the community at large. The emotional, psychological and social impact of these missed opportunities, not only incapacitates the child with developmental delay but the whole family is subjected to agonizing debilitation.

Children with global developmental delay often develop learning, behavioural, or emotional problems and may be at higher risk for other health problems (Williams & Clinton, 2011). Early exposure to associated risk factors sets children on a lower developmental path. Long-term effects on schooling and income contribute to continued inequalities in the next generation. The pathways to reduced productivity and yearly adult income in affected children could be linked to fewer years of schooling, learning or academic achievement.

Most studies on developmental delay and associated factors were done in developed countries. The few researches carried out in Nigeria and other sub-Saharan African countries are majorly on prevalence with little or no specific attention given to possible associated factors (Adebamia et al.,2011; Nguefack et al., 2013; Ajediran et al., 2013). Assessment of factors associated with developmental delay at an early age could be vital in early treatment and reduced impact on the child, the family and the society. Identifying the family characteristics and psychosocial correlates of developmental delay peculiar to a developing country like Nigeria should be of help when planning effective strategies to support the wellbeing of the children at risk. Moreover, investigating factors affecting child development in under-five age group

which coincides with preschool entry point may reveal opportunities to tailor early intervention programmes for the greatest effectiveness, social benefit and economic gain. This study therefore set out to find the family characteristics and psychosocial factors associated with developmental delay among children five years and below in two sub urban communities in Lagos state.

1.2 Aim and Objectives

1.2.1 Aim

To determine family characteristics and psychosocial factors associated with developmental delay among under-five children residing in two communities in Lagos, Nigeria

1.2.2 Specific Objectives

1. To determine the prevalence of developmental delay among under-five children in two communities in Lagos
2. To determine the family characteristics associated with developmental delay among under-five children in the study location
3. To identify the psychosocial factors associated with developmental delay among under-five children residing in the two communities in Lagos.

CHAPTER TWO

LITERATURE REVIEW

2.1 Child development

Child development refers to the biological, psychological and social changes that occur in human beings from conception to adolescence, as an individual progress from dependency to increasing autonomy (Davies, 2004). Normal development follows the fundamental principles of orderly sequence, with individual differences in the rate of growth and development; proceeds from head towards the heels (cephalo-caudal), from central line of the body to the outer parts (proximo-distal) and for infants of all cultures. It is a continuous process with a bilateral to unilateral trend, and different aspects are interrelated and interdependent. It is also cumulative and proceeds from general to specific (Udegbe et al., 2006).

Child development is a product of interaction between hereditary forces inherent in the genetic constitution of the child and the environment and involves qualitative as well as quantitative changes (Udegbe et al., 2006). It also involves the understanding of what forces in the environment that influences the unfolding human life, determining their pattern of influence and recommending ways of controlling and minimizing the harmful forces so that human development may be enhanced.

2.2 Historical perspective

The topic of child development has been a thing of curiosity to man through the ages. Early philosophers like Plato and Aristotle provided insight into the critical issues in child care though their methods were unscientific (Siegler et al., 2014). Plato believed that children were born with innate knowledge and emphasized on self-control and

discipline while Aristotle, on the other hand, accepted that knowledge comes from experience and was concerned with fitting child rearing to the needs of the individual child. Both agreed that long time welfare of any society depended on children being raised properly (Siegler et al., 2014). Later on, philosophers such as John Locke saw child as *tabula rasa* while Jean-Jacques Rousseau believed that parents and society should give children maximum freedom from the beginning of life for optimal development (Siegler et al., 2014). Charles Darwin's theory of evolution in the nineteenth century championed the research-based approach that revolutionized the study of child development in order to gain insights into the nature of human species. He published a detailed account of the development of his children up to 18 years and first described the concept of cephalo caudal sequence of human development (Darwin, 1877).

One of the central themes in the study of child development through the ages has always been Nature and Nurture Controversy- how much of Nature and how much of Nurture guide child development. This has led to many disciplines and theories of child development (Warren, et al. 2014). The concept of child development varies according to theoretical framework adopted. To an anthropologist, a child is studied in relation to his culture and ancestry. To a psychologist, child development is about the development of child personality, and the sociologists study child development in relation to social structures surrounding the child. The paediatrician is concerned with childhood diseases and medical interventions. Research in child development is useful in the practice of identifying, classifying and intervening in children's problems.

Child development is also studied in relation to periods or interval of specific development. Some of the defined intervals of age –related developmental periods are

the prenatal, postnatal, infancy up to school age period (Gleitman, et al 2007). Prenatal period starts from conception to birth. Post natal period starts immediately after birth as newborn (ages 0-4weeks), infancy (ages 1week to 1 year), toddlerhood (ages 1-3 years), preschool (ages 4-6years), school age (6-13years) and adolescence (ages 13-18year) (Kail and Robert, 2011).

At every stage in child's development, a child is expected to achieve a certain ability or skill known as developmental milestone. Developmental milestones are skills that most children are able to perform by a certain age. Mastery of skills that are essential for economic success and the development of their underlying neural pathways follow hierarchical rules in a bottom-up sequence such that later attainments build on foundations that have already been laid (Warren et al., 2014).

2.3 Developmental milestones

Child's development is characterized by specific skill or behaviour at certain age or stage as the child grows known as milestones - thus a child must acquire neck control before sitting (Peddihough, et al 2009). Development of children under the age of five years is grouped into areas of development known as developmental domains. National Infant and Toddler Child Care Initiative, (2010) recognizes five key domains of development in children, namely gross motor skills, fine motor skills, communication and language skills, cognition skills and social/personal activities.

- ✓ Fine Motor involves how children manipulate objects and use their hands.
- ✓ Gross motor development: how children move.
- ✓ Speech and language development: how children communicate, understand and use language.
- ✓ Cognitive/intellectual development: how children understand, think and learn.

- ✓ Social / personal development: how children relate with others and develop increasing independence. (See Appendix I).

Aina et al (2005) noted that Nigerian children under the age of 0 to 30 months have higher mean score in gross and fine motor developmental milestones in comparison to their Caucasian counterparts.

2.4 Developmental delay

Developmental delay is a descriptive term used when a young child's development is delayed in one or more areas compared to other children of the same age. Developmental delay (DD) is then a term used for children who lack developmental features and skills in the language, motor and social/personal adaptive developmental areas that would be expected of children of their age (Peter et al., 1998). It is said to exist when a child does not reach developmental milestones at the expected date (Simeonsson et al., 1992). The delay in development can be traced to prenatal period when the brain is much more sensitive to environmental influences than later in life, because all of the neurons originate from a small layer of cells. The baby does not have the full protection of the blood–brain barrier until its sixth month of prenatal life so the brain is exposed. This barrier helps to keep out large molecules, like toxins or heavy metals that may damage the brain. Any impact to the brain cells during prenatal period can have cascading impacts as the baby develops (Kaila M, 2008).

Early brain development is also the foundation of human adaptability and resilience. When brain development is suspended or delayed there may not be potential for subsequent regeneration and repair and this may lead to long lasting or permanent disability (Kaila, 2008). Males are reported to be more affected than females (Boyle et al., 2015).The nervous system is relatively unique in that different parts are

responsible for different functional domains, and these develop at different times (e.g., motor control, sensory, intelligence and attention). In addition, many cell types in the brain have different windows of vulnerability with varying sensitivities to environmental agents (Mondela P., et al 2002). Similarly, the type of developmental delay also varies and can be based on varying criteria.

2.5 Classification of developmental delay

Classification of developmental delay varies according to different instruments used and the domain under study.

2.5.1. Developmental delay can be classified as transient or persistent. A delay in child development is classified as "Transient", when there is a total catch up as the child grows and matures and the development progresses on at a normal rate. The factors associated with transient delay may be related to culture, physical illness, prolonged institutionalization, immaturity (mild), family stress, lack of stimulation or opportunities to learn. Persistent developmental delay is the delay in development that is persistent, more severe, and may affect one or more areas of development.

2.5.2. Developmental delay is also classified into single/specific and global developmental delay, according to number of domains affected. Single or Specific developmental delay occurs when there is significant delay in only one developmental area, for example, there can be significant delay in fine or gross motor skills with no impairment in other developmental areas. Global developmental delay is said to occur when two or more domains of development are affected.

2.5.3. Delay in development has also been classified according to the specific area affected, for example, Motor delay-significant delay in fine or gross motor skills with no impairment in other developmental areas, Developmental language disorders- significant delay in receptive and/or expressive language skills with no delay in other developmental domains etc.

2.6 Prevalence of Developmental Delay

World Health Organisation (2008) found out that 15% of children under 5years olds worldwide are developmentally delayed, 85% of them in developing countries (Silberberg, 2001). Similarly, National Health Interview Survey (2008) put the prevalence rate at 15.04% for children between the ages of 0-17years in the United States. Grantham-Mcgregor et al, (2007) estimated that over 200 million children under- five years are not fulfilling their developmental potential. About 10 percent of all infants, toddlers, and preschool children are classified as developmentally delayed (U.S. Department of Education, 1995), but The Council of Australian Government (2009) estimated that 7.2% of 0-14years are developmentally delayed.

Examining prevalence of developmental delay in apparently normal preschool children aged 4-60 months in Iran; Yaghini et al (2015) reported a rate of 13.1% using Persian Version of ASQ. This study was done among children on entrance to kindergarten. In India, Sachdeva (2010) discovered that the prevalence of global developmental delay among children aged 0-3 years was 7.1%.

In a study conducted at a Neurologic clinic in Cameroun, Nguefack et al (2013) found a prevalence of developmental delay among 296 under-five years old children, to be 51.7% and 7.1% of all the admissions to the unit ward.

In Ghana, Ajedian et al (2013) in a study conducted among children in rural community welfare clinic using ASQ, found that 44.6% of the children had

developmental delay; 12.4% had developmental delay in social/personal interaction while 19 (5.8%) had delay in the communication developmental domain. Using Ages and Stages Questionnaire, Oguntoyinbo (2014) in another study in two rural areas in Nigeria, among children less than 5 years of age, a prevalence of 26.4% for developmental delay was reported among the study population; rate of specific developmental delay was 19.9% while global developmental delay was 6.5%.

The high prevalence of developmental delay observed from previous studies, especially in developing countries could be a reflection of synergistic effects of associated modifiable factors for the delay such as nutritional deficiencies, increased exposure to illnesses, lack of immunization and access to health care, inadequate housing and sanitation, and barriers to education (Simeonsson, 2004).

2.7 Factors associated with Developmental Delay

Possible etiological factors for developmental delays are numerous. They are categorized as genetic influences inherited from biological parents and environmental influences, psychological and social factors (Dunlop et al, 2014). Physiological factors can also be referred to as biological or genetic influences. Inherited disorders such as metabolic conditions (e.g., Phenyl Ketonuria) or syndromes (e.g., fragile-X) and being a male are examples of genetic factors that contribute to biological changes. Many factors associated with developmental delays are often not clearly determined and every child has a unique pattern of delay (Dunlop et al, 2014). Delays based on genetic influences are estimated to account for about 15 to 25 percent of developmental disorders. About 75 to 85 percent of these cases are associated with characteristics of the child's family and psychosocial variables surrounding the child or the reasons for developmental delays remain unknown (Bee, 1995). Risk for delay

and poor outcomes are cumulative such that children exposed to a greater number of risks have poorer outcomes than children exposed to less risk (Sameroff et al., 1987).

2.7.1 Family characteristics

Child's immediate environment (Family) characteristics can either strengthen or weaken the child's innate ability to achieve developmental milestones. Many studies have shown that brain development is modified by the quality of the environment. Early exposure to poor dietary practices, overcrowding and noise stress, and poor stimulation has negative effect brain development. Maternal or parental education and occupation, family size and pattern of interaction also have effect on brain structure and function, with subsequent lasting cognitive, social and emotional outcomes (Black et al., 1998; Meaney, 2001; Morgan et al., 2001; Webb & Nelson 2001, Rodia, 2004). The most pervasive factor that runs through all of these is poverty, expressed in inadequate nutrition, lack of health care and limited resources for growth.

Family characteristics include such variables as mother to child interaction, including breast feeding, family structure, physical environment, parents' literacy, occupation, as well as access and attitude to medical and social services. Simeonsson et al (2004) opined that there is variability in the nature and distribution of the disability and that this variability is attributable to child and family factors as well as social and cultural characteristics. Their findings further revealed that children's disability constitute a significant problem in developing countries ranging from 8% to 14%. Grantham-McGregor (2007) also said that many children younger than 5 years in developing countries are exposed to multiple risks, including poverty, malnutrition, poor health, and unstimulating home environments, which detrimentally affect their cognitive, motor, and social emotional development.

Inadequate nutrition and feeding practices alone, or in combination with anaemia and infections or disease, plays a significant role in the increased vulnerability of poor health and development of young children in developing countries (Yousafzai et al., 2003).

Changes in food or dietary practices as determined by urbanization have resulted in decline in breast feeding and increase in artificial feeding. Young et al (1982) examined the role of feeding practice and child development in Tunisian infants. They compare breast feeding, artificial feeding and combination of the two and found out that breast feeding is associated with more favourable performance on motor and mental development and protection from diseases.

2.7.2 Family Structure

Research over the past several decades has shown that family structure is a strong predictor of child outcomes. Family structure deals with the number of parents and their relationship with the children in the house and includes the social and economic resources in the home (Schneider et al., 2005). It is one of the fundamental characteristics of the family that a significant and sustaining effects on the children. A family structure can constrain the availability of economic and social resources such as parents' ability to spend time with their child, be involved in educational activities, and expend monetary resources that can promote positive educational outcomes and well-being (Schneider et al., 1998). When compared to children living with their married parents, children in single-parent families are at a greater risk of developmental issues (Schneider et al., 2005). Specifically, growing up with only one parent has been associated with a number of negative outcomes. Amato (2001) has shown that family structure can facilitate or limit the ways in which parents are able to positively influence the future outcomes of their children, and that most children in

non-traditional families are at an educational and social disadvantage compared to children in traditional families. Some of the explanations for this disadvantage have been tied to income differentials, time constraints, and commitment to the child's wellbeing, especially in families with step-parents (Schneider and Coleman, 1993).

In comparison to step-families, cohabiting relationships and foster care appear to be even more deleterious with respect to child outcomes (Schneider et al., 2005). An enriching and stimulating home environment fosters healthy growth and brain development by providing a child with love, emotional support, and opportunities for learning and exploration. In families where only one parent is present, there are often fewer economic and emotional resources. Competing demands at work and at home can hinder a parent's ability to provide an environment conducive to learning and development.

Parents or immediate caregivers to newborn are the most significant factor in a child's life, because they serve as a template for the child's development. A mother is the most important person in a baby's life for physical, social, cognitive and emotional development. The health, emotional and diet of the mother during and after pregnancy is very crucial to the development of the child. Nguafack et al., (2013) found out drinking alcohol during pregnancy was the main antenatal predisposing factor for developmental delay in accounting for 12.4%. A study of a group of infants raised by their natural mothers showed that the level of the child's emotional and intellectual development was directly related to the amount and quality of his/her interactions with his/her mother (Omolara 2015). A mother that has to work for long hours outside the home, on paid employment shortly after giving birth, may be preparing the child for suboptimal development.

Chun Chen et al., in 2004 reported that parents play an important role in detecting children with speech, motor and behavioural disorders and concluded that parental concern about speech and motor delays produced a significant positive predictive value for the development of the child. Nguefack et al (2014) in their study discovered that main developmental domain of parental concern in Cameroun was the motor domain (90.2%). A possible factor for the predominant motor concern is that sitting, walking and other motor functions are important factors that determine the autonomy of the child. In the early years, unique opportunities exist to influence children's development trajectories and their families (Hertzman 1996; Guralnick 1998; & Campbell 2002). Children from the dysfunctional family are not only developmentally delayed, they are also likely to do poorly in school and subsequently have low incomes, high fertility, and provide poor care for their children, thus contributing to the intergenerational transmission of poverty (Grantham-Mcgregor at al., 2007).

2.7.3 Parental education

This is another factor in child development. Von de Lippe (1999) in his study of mothers of 5-8 years old children in Cairo from low income families discovered that mothers who worked are more oriented to earlier time table for development and more likely to provide stimulation and to interact with their children than the mothers with limited schooling. Furthermore, improved parental education particularly mothers, is related to reduced fertility and child survival (Rosenzweig and Wolpin, 1994).

2.7.4 Employment and Income

Closely related to parental education is their occupation, the amount and quality of time they spend with the children and the available income. Income influences the

immediate ability of families to provide for the basic needs of family members, including young children. Extreme poverty creates conditions in which all adults in the family must work outside the home. Poverty also means that parents cannot afford to pay for good quality alternative care. Thus, alternative care is sought within the family. If siblings are called upon to provide care, they may have to leave school prematurely and the quality of the care may be lower. Whether a family will remain poor or rich is a function of the occupation of the family members. Securing employment may help the family earn more income to survive, leaving the classification of extreme poverty, but this process may also be detrimental to the child's psychosocial development (World Bank).

2.7.5 Overcrowding and Noise

Evans (2001) examined the effects of physical environment on children's well-being. His work revealed that the effects of the physical environment—noise level, overcrowding, and housing and neighborhood quality are as significant for children's development as psychosocial characteristics such as relationships with parents and peers. Indeed, the physical environment profoundly influences developmental outcomes including academic achievement, cognitive, social and emotional development as well as teachers and parenting behaviour. He further reveals that chronic and acute exposure to noise affects cognitive development particularly long term memory, short term memory effect is variable depending on the volume of the noise.

2.8 Psychosocial Factors

Walker et al (2007) estimated that at least 200 million children in developing world are prevented from attaining their developmental potentials. This can be by the reason of poor maternal mental health, low or no social capital, violence and other social

factors. These modifiable psychosocial risk factors encountered by infants and children are best taken of, by intervention for social support, freedom from violence, basic hygiene and food security.

2.8.1 Maternal Wellbeing

Risk factors for developmental problems at school entry are related to maternal well-being and history of abuse, which can be identified in the prenatal period or when children are in the preschool age group (Tough et al., 2010). Poverty, economic stresses, domestic violence, lack of status, and lack of control in family decision making all put additional strain on the mother of these young children (Warren 2013). Tough et al (2010) indicates a direct relationship between the well-being of mothers and the development of their children at school entry. They had a follow up study at 3 years later and still discovered that the direct relationship between the well-being of mothers and the development of their children begins in the early years and persists through to school entry. Their findings suggest that children may not recover from early threats to development that occur before age 3 by simply through maturity, independence or through increased interactions outside the home. This work highlights the critical importance of maternal well-being and parenting morale in child development, and emphasizes that these can be unrelated to economic security and maternal education.

2.8.2 Social Capital/Support

These are social benefits which accrue to the family from social relationship with communities. These often have an impact on children's well-being as early as the preschool years. In these years, it seems to be the parents' social capital that confers benefits on their offspring, just as children benefit from their parents' financial and human capital. Social capital may be most crucial for families who have fewer

financial and educational resources. Children of mothers who reported low social support were discovered to be significantly more likely to be at high risk for developmental problems (Tough et al, 2010). Braveman et al (2005) suggests that those interested in the healthy development of children, particularly children most at risk for poor developmental outcomes, must search for new and creative ways of supporting interpersonal relationships and strengthening the communities in which families carry out the daily activities of their lives.

Depriving children of basic health care and denying them good social support, adequate mental health and healthy family structure and function needed for growth and development could sets them up to fail in life. On the other hand, when children are well nourished and cared for and provided with a safe and stimulating environment and psychosocial health, they are more likely to survive, to have less disease and fewer illnesses, and to fully develop cognitive, language, emotional and social skills (Briggs 2007).

2.9 The Study Instruments

The ability to determine the prevalence of developmental delay in these age group of children (aged 0-5 years) and asses the family characteristics and psycho social factors of the primary caregivers associated with the delay is very important in planning for provision of a wide range of interventions to comprehensively address the developmental challenges in this group. To this end, the following instruments were used for the study.

2.9.1 Socio-demographic Form: This was developed by Omigbodun et al (2008) and consists of questions relating to socio-demographic characteristics of the participants (children and their caregivers). This instrument was modified by the

researcher to cover the contextual physical and socio-economic environment of the participants. (See Appendix II).

2.9.2 The Ages and Stages Questionnaires (ASQ): A reliable parent/caregiver-completed developmental screening tool for children in their first five years has the advantage of parents being active participants in the evaluation of their children (Squires, Potter & Bricker, 1997). The ASQ allows professionals to quickly identify young children at risk for developmental delays, identify behaviours of concern to caregivers, and identify any need for further assessment (Bornman *et al.*, 2010; Squires *et al.*, 1997). It encompasses five developmental areas, with six questions in each of the following: communication, gross motor, fine motor, problem-solving, and personal social development. It is noted by its publishers as having 94% reliability and between 75% and 89% validity. It is written in simple language, and includes illustrations and numerals, and is thus functional in contexts where people may have limited literacy skills (Bornman *et al.*, 2010; Levin, 2006; Salisbury, 1992). This age group was selected, as it would be the ideal age for informal school-readiness screening assessments. It is only at the age of 5 years (60 months) that assessments are completed to ensure that the child is ready to learn by school age (Davin & Van Staden, 2012). (See Appendix III).

2.9.3 Patient Health Questionnaire (PHQ-9) (Kroenke et al, 1999): The Patient Health Questionnaire (PHQ) is a self-administered version of the PRIME-MD diagnostic instrument for common mental disorders. This instrument assesses eight diagnoses, divided into threshold disorders (disorders that correspond to specific DSM-IV diagnoses: major depressive disorder, panic disorder, other anxiety disorder, and bulimia nervosa), and sub-threshold disorders (disorders whose criteria

encompass fewer symptoms than are required for any specific DSM-IV diagnoses: other depressive disorder, probable alcohol abuse/dependence, somatoform, and binge eating disorder) (American Psychological Association, APA, 2016). It offers a concise, self-administered tool for assessing depression and incorporates DSM-IV depression criteria with other leading major depressive symptoms into a brief self-report instrument that are commonly used for screening and diagnosis, as well as selecting and monitoring treatment (Kroenke et al, 2001). The diagnostic validity of the 9-item PHQ-9 was established in studies involving 8 primary care and 7 obstetrical clinics. PHQ-9 scores > 10 had a sensitivity of 88% and a specificity of 88% for Major Depressive Disorder. Reliability and validity of the tool have indicated it has sound psychometric properties. Internal consistency of the PHQ-9 has been shown to be high. A study involving two different patient populations produced Cronbach alphas of .86 and .89. Criteria validity was established by conducting 580 structured interviews by a mental health professional. Results from these interviews showed that individuals who scored high (≥ 10) on the PHQ-9 were between 7 to 13.6 times more likely to be diagnosed with depression by the mental health professional. On the other hand, individuals scoring low (≤ 4) on the PHQ-9 had a less than a 1 in 25 chance of having depression (Kroenke et al, 2001). (See Appendix IV).

Health Related Quality of Life (HLQOL) instrument provide a useful means of measuring health outcome at the population level (Toscari et al 2007). A brief, easily translatable, interviewer-administered HRQOL instrument could make an important contribution in measuring overall general physical and mental health in the caregivers of the children.

2.9.4 Short form questionnaire SF-8 (Ware et al, 2001), is a generic multipurpose short-form Health-Related Quality of Life (HRQOL) instrument, developed for the RAND Corporation and the Medical Outcomes Study (MOS) in the 1980s, and now published by Quality Metric Inc. It was originally a short-form health survey with 36 questions (Ware et al, 2001). SF-8 Health Survey measures the same eight health domains as the SF-36v2 Health Survey using only eight questions and was developed primarily for use in large surveys of general and specific populations, for comparing the burden of diseases across different age, disease, and treatment groups. It has been shown to be effective in monitoring population health and large-scale outcomes studies (Vasoontara et al, 2014). It is also a potential instrument that meets criteria of brevity (it has a 1–2 minute administration time), ease of translation and use. The instrument provides a generic measure of physical and mental health status which is not specific to age, disease or treatment group. It can be interviewer-administered and so used with respondent groups with low literacy levels (Ware et al, 2001). The instrument uses single-item scales addressing eight domains of general health, physical functioning, role limitations due to physical health problems, bodily pain, vitality (energy/fatigue), social functioning, mental health, and role limitations due to emotional problems. (See Appendix V).

2.9. 5 Oslo -3 (Dalgard O.S, 2009). Several researchers have shown that the type of social support available to individuals can predict their mental well (Abiola et al, 2013). The Oslo Social Support Scale (OSS) was used to assess the caregivers' social support base. The Oslo 3-item Social Support Scale provides a brief measure of social functioning and has been considered a good predictor of mental health and covers different fields of social support, as it measures the number of people the respondent feels close to, the interest and concern shown by others, and eases of obtaining

practical help (Dalgard O.S, 2009).. The Oslo Social Support Scale had been validated in Nigeria (Abiola et al, 2013). (See Appendix VI).

CHAPTER THREE

Methodology

3.1 Study Area and Setting

The study was carried out in the places of residence/ residential homes of the children with their primary caregivers in Afariogun and Oluyeye wards.

3.1.1 Afariogun and Oluyeye were the two selected communities/ political wards in Oshodi LCDA with 35 and 27 streets respectively. Afariogun has 17,130 children under the age of five years, out of the total population of 85,650, while Oluyeye has 16,650 of its 83,325 population as children five years and below (Oshodi/ Isolo LGA Secretariat 2015).

3.1.2 Oshodi- this is the first, the largest and the fastest growing LCDAs in Oshodi/ Isolo LGA with seven wards and a population of 1,713,475, out of which 342,695 are children under the age of five years old. The seven wards are: Afariogun, Ewu-tuntun, Igbehinadun, Mafoluku, Ogunoloko, Oluyeye and Shogunle (Oshodi/ Isolo LGA Secretariat 2015).

Oshodi is mostly congested with substandard houses and a fairly good road networks. Power is from National Grid, and every house sources for its own water supply. The toilet system of most residents is water closet. It has one of the biggest markets in Lagos, the populous and ever- busy Oshodi Market. The people are of middle and low income, mainly traders and artisans from mostly Igbo and Yoruba ethnic group, though every tribe can be found there.

3.1.3 Oshodi/Isolo is a Local Government Area (LGA) within Lagos State, with a population of 621,509 people, and an area of 45 square kilometres (Lagos States Social Security Exercise 2006 census). It is divided into 3 political zones orLocal

Council Development Areas namely: Oshodi, Isolo and Ejigbo for administrative purposes (Oshodi/ Isolo LGA Secretariat 2015).

3.1.4 Lagos State is the first and the largest cross metropolitan city in south west geo-political zone of Nigeria, with Ikeja as the capital. It was the capital of Nigeria until 1992 when the national capital was moved to Abuja but the state remains the commercial capital of Nigeria. It has an area of 3577km square, 22% of which are lagoons and creeks. It is made up of 20 Local Government Areas (LGAs) and 37 (LCDAs) Local council Development Areas.

Lagos is the most populous city in Nigeria with a population of 25, 087 059 according to Lagos States Social Security Exercise 2006 census. It is the second fastest growing city in Africa and one of the most populous in the world. It is anecdotally said that every family in Nigeria has at least a member in Lagos State so the state can be said to be a mini-Nigeria with every tribe and ethnic group ably represented.

3.2 Study Design

This study adopted a cross-sectional design to examine the family characteristics and psychosocial factors associated with developmental delay among children under the age of five years of age in Oshodi Local Council Developmental Area in Oshodi/Isolo Local Government Area, Lagos State.

3.3 Study population

The study consisted of male and female children of five year and below from Afariogun and Oluyeye wards in Oshodi local Council Development Area of Oshodi/Isolo Local Government Area, Lagos State. The area is majorly inhabited by low income earners, traders and artisans in single or two room apartments with common toilets and kitchens.

3.3.1 Inclusion Criteria

Apparently normal children of five years and below whose parents gave written informed consent.

3.3.2 Exclusion Criteria

1. Children above five years of age and those with established / known developmental disorder, for example Down Syndrome. This is because c such conditions are known to be associated with developmental delay and the children were already receiving interventions.
2. Children with chronic medical conditions such as sickle cell diseases.

3.4 Sample size calculation

The sample size for the participants was determined using the formula:

$n = Z^2 P(1-P)/d^2$ (Kish, 1965)

Where n = sample size,

Z = statistic for a level of confidence, (1.96 for 95%)

P = expected prevalence of developmental delay.

d = precision (5%, d = 0.05)

Thus, the minimum sample size (N) proposed for this study =

Using Nguefack's prevalence of developmental delay in Cameroun of 51.7% ≈ 52% (Nguefack et al, 2013) $=1.96^2 \times 0.52(1-.52)/0.05^2=384$. Adjusting for an anticipated non-response rate of 30%, the sample size was 384/ (100 – 30%) = 499, that is minimum of 499 children proportionately distributed between the communities. This was increased 501

3.5 Sampling Technique

This study adopted two stage cluster sampling technique:

Stage one: Random selection of Oshodi local council development areas (LCDA) out of the three LCDAs in Oshodi / Isolo local government area. Oshodi LCDA has seven wards and each ward was treated as a cluster.

Stage two: Two clusters were selected by balloting and the sample size was proportionately distributed to the clusters based on the population of children under the age of five years, obtained from the immunization section of the Ajibulu Primary Health Centre. Households within the selected clusters were visited and all the children under the age of five years that met the inclusion criteria and their primary caregivers were recruited. Households with more than one child under the age of five years had only one child randomly interviewed. This is done in order to substantially cover the study area and also to asses same number of caregivers.

3.6 Study Instruments

Data was collected using the following questionnaires.

3.6.1 Socio-demographic Form (Omigbodun et al, 2008)

It is a semi-structured questionnaire which elicits responses from the primary caregivers concerning the child (age, gender and gestational age at birth) and socio-demographic and family characteristics of the carers (marital status, occupation, number of people in the house etc). (Appendix II)

3.6.2 Ages and Stages Questionnaire.

This is a screening instrument for children developed by Squires and Bricker (2009). (Appendix III). It can be administered by researcher or the caregiver. It consists of age

appropriate questionnaires in each of the five domains of child developments namely: cognitive/problem solving skills, communication/language skills, gross motor skills, fine motor skills, and social/personal interaction. There are twenty-one age groups: 2, 4, 6, 8, 9, 10, 12, 14, 16, 18, 20, 22, 24, 27, 30, 33, 36, 42, 48, 54, and 60 months. Each set is composed of 30 items with six items in each of the five domains. The test was administered through the caregivers who were familiar with the child's developmental trends. The score was obtained in each of the domain as follows: 'yes' response has 10 points, 'sometimes' has 5 points and 'not yet' has 0 point with the sum of 60 points as maximum score in each domain. Total domain sum was obtained and compared with the given cut-off point. The child was referred for further assessment to Child and Adolescent Mental Health Services, Oshodi Annex of Neuropsychiatric Hospital Yaba if he or she scored below a given cut-off point in each domain. The questionnaire has a test- retest Cronbach's Alpha of 0.75 (Oguntoyinbo, 2014).

3.6.3 Patient Health Questionnaire (PHQ- 9)

This was developed by Kroenke et al, (1999). (Appendix IV). It is a multipurpose instrument that can be used to screen for depression and also the general well- being of the populations. It is a widely used instrument (Rost & Smith 2001; Pinto-Meza et al, 2005; Kagee 2008), and was used, for this study, to assess for depressive symptoms in the primary caregivers. It has 10 items, rated from the past four weeks, with scores ranging from 0-30. This was obtained as follows: 'Not at all' is 0, 'Several days' is 1, 'More than half the days' is 2 and 'Nearly every day' is 3 in separate columns. Each column was totaled and the sum of the columns obtained. A total score of 0-4 would mean the carer is in good mental health, 5-9 was minimum symptoms, he/ she would be counseled, 10-14 signified minor depression, 15-19

meant major depression and >20 was indicative of severe depression. It takes about 5 minutes. The split-half reliability for this study was found to be 0.627 with Cronbach's Alpha of 0.851.

3.6.4 SF-8 Health Survey Questionnaires (Ware et al, 2001)

This is a Health Survey instrument adapted from SF-36 revised version, (Appendix V). It is designed to assess the general population wellbeing in 8 domains of health and for this study, was used to assess the wellbeing of the caregivers. Each domain has a single item: physical functioning, role limitations due to physical health, bodily pain, general health perceptions, vitality, social functioning, role limitations due to emotional problems, and mental health. It provides generic measure of physical and mental health status, easy to understand. It is brief and can be completed in two minutes. It can be self or interviewer administered. In this survey, the score for each domain and each component was obtained by summing up the items. The scores ranged from 8-42, with a mean of 20.84 and SD=4.79 in the general component. Physical component has a mean of 10.92; SD of 2.11 and the mental component has a mean of 9.91; SD=3.79. Any score below the average was considered poor health. The split-half reliability for this study was found to be 0.752 with Cronbach's Alpha of 0.892; physical component had a split-half reliability of 0.801, Cronbach's Alpha of 0.724. The mental component had reliability of 0.893 and Cronbach's Alpha of 0.615.

3.6.5 OSLO 3- ITEMS SOCIAL SCALE (Dalgard O.S, 2009).

OSLO-3 is a social support instrument, adopted from Hopkins Symptom Checklist-25 (HSCL-25) and designed to measure perceived social support (Appendix VI). The 3 questions cover family, friend and neighbourhood domains with scores ranging from 3-14. It is used to assess social support of the caregivers of the children. In scoring, a

sum is obtained by adding the raw scores. Scores of 3-8 meant poor support, 9-11 meant moderate support and 12-14 meant strong support. It had been used in several studies and had also been validated in Nigeria (Abiola et al, 2013).

All the instruments were translated to the local language (Yoruba) by a linguist from Linguistic department, University of Ibadan and back translated by another linguist. (See Appendix VII).

3.7 Test administration

The researcher was trained on the use of the instruments by her supervisor, Dr Bello-Mojeed. Four research assistants (two graduates and two secondary school certificate holders) were subsequently trained to administer the instruments for two weeks, of two sessions per week.

During the field work, the consent and cooperation of the subjects were secured and the normal health status of the children ascertained from the caregivers. The assessment would then be made in a quiet and conducive environment at the corridor or veranda in the subject's home. The tests were carried out in the evenings (between 5 and 6 pm), on weekends (Saturdays and Sundays) and during the second term holiday when the children were at home. The researcher and / or the assistants would stay with each respondent (caregiver) and the child to observe and assist to get the required responses. With different play toys and improvised test materials (footballs, counting materials, drawing books, pencils, crayons, skipping ropes, building blocks, string materials, biscuit crumps, brightly-coloured objects etc) to demonstrate with and biscuits and sweets as tokens, the children were persuaded to perform the age-appropriate tasks. The researcher assessed as the child performs the tasks while the caregiver observed. The respondents (caregivers) were noticed to be a bit hesitant

initially but as they saw the researchers demonstrating with the children, they relaxed and thereafter answered their own questionnaires.

3.8 Data management

Data was analyzed using Statistical Package for Social Sciences (SPSS) version 20.Percentages and figures were used for socio demographic characteristics of the children and their caregivers. Chi Square was used to test for associations between family characteristics, psychosocial factors and developmental delay. Level of significance was 0.05.

3.9 Ethical Consideration

This study was carried out in accordance with the ethical principles enshrined in the Helsinki Declaration and the National Human Research Ethical code. Permission was obtained from the Medical Officer of Health (MOH), Oshodi/Isolo Local Government Area. (See Appendix VIII)

3.9.1 Confidentiality of Data

Participants were assured that all information would be kept in strict confidence.

3.9.2 Invitation to participate

All the parents or primary caregivers of eligible children were asked if they would be interested in participating in the study. Detailed explanation of the test and relevance of the study was provided in the language best understood by the respondents. Participation in this study was entirely voluntary and signed informed consent was obtained from parents or primary caregivers.

3.9.3 Beneficence

There were no monetary benefits for participating in the study. However, the children were given sweets and biscuits as tokens. The parents/caregivers were informed of

their children's scores and counseled on the need for follow up and or referral if need be. The study also provided avenue for participants to access more information about their children's developmental trends, their own emotional health status and the generated data would hopefully stimulate other research interest on children's developmental trajectory, delay and its correlates.

3.9.4 Non-Maleficence

The study was not injurious to the subjects in anyway as no form of invasive procedure was involved.

3.9.5 Voluntariness

Participants had the right to decline participation in the study or withdraw participation from the study at any time.

CHAPTER FOUR

RESULTS

A total of five hundred and one (501) copies of questionnaire were administered to the 501 children and 501 caregivers, out of which four hundred and eighty-six (486) were valid for analysis, yielding 97% response rate. Presented below are the findings of the study.

4.1. Socio demographic characteristics of the children

Table 1 presents the frequency distribution of socio demographic characteristics of the children. Their ages ranged from 1.5 to 60 months with a mean age of 27.8 ±13.3 months. Highest proportion of the children (37%) was between 12 and 23 months old while the least proportion (9.7%) was less than 12 months old. Slightly greater than a half (51.8%) of the children was males. Majority (90.5%) of the children were products of term pregnancies. Their gestational ages at birth ranged from seven months to ten months with a mean of 8.9 ± 0.32 months. 55.6% of the children were reported as the first child of their parents. Almost all (96.1%) of the children had their mothers as the primary caregivers.

Table 1 Socio demographic characteristics of the children. N=486

Variable	Frequency n	Percentage %
Age		
Less than 12 months	47	9.7
12-23 months	180	37
24-35 months	113	23.3
36-47 months	85	17.5
48 months and above	61	12.5
Gender		
Male	252	51.8
Female	234	48.2
Pregnancy's age at birth		
Seven months	3	0.6
Eight months	40	8.3
Nine months	440	90.5
Ten months	3	0.6
Birth order		
First	270	55.6
Second	111	22.8
Third	62	12.8
Fourth	31	6.4
Fifth	8	1.6
Sixth	4	0.8
Primary caregiver		
Mother	467	96.1
Grandmother	3	0.6
Father	1	0.2
Other relatives	15	3.1

4.2 Socio-demographics and Family Characteristics of Caregivers.

The ages of the caregivers ranged from 20-45 years with a mean of 30.6 ± 7.01years. Greater proportions of participants were either in the age range 20 – 29 years 173 (35.6%) or 30 – 39 years 177 (36.4%). Three hundred and sixty-six (75.3%) of the primary caregivers of the children were married and more than three quarter 396 (81.5%) were from monogamous family settings. Slightly greater than a half 266 (54.7%) was found to be Christians. Two hundred and forty (49.3%) were of Yoruba ethnic group. Father's level of education showed that about half 264 (54.3%) were SSCE holders, while 315 (64.8%) were civil servants. Two hundred and ninety four (60.5%) of the care givers were SSCE holders and 187 (38.5) of them were businesswomen. Two hundred and seventy (56.6%) of the caregivers had one child. About two third 328 (67.5%) had no other relatives living with them and 222 (45.6%) had up to 4 or more persons sleeping in the same room with the child. One hundred and seventy seven (36.4%) of the caregivers lived in a room and parlour apartment. Almost all 464 (95.5%) said that they were the mothers of the children.

Table2: Socio-demographics and family characteristics of caregivers N= 468

Variable	Response	Frequency n	Percentage %
Age	Less than 20 years	47	9.7
	20-29 years	173	35.6
	30-39 years	177	36.4
	40 years and above	89	18.3
Marital status	Single	120	24.7
	Married	366	75.3
Family setting	Monogamous	396	81.5
	Polygamous	90	18.5
Religion	Christianity	266	54.7
	Islam	220	45.3
Ethnicity	Yoruba	240	49.3
	Igbo	90	18.5
	Hausa	47	9.7
	Other ethnicity (e.g Benin)	109	22.4
Father's level of education	No formal education	110	22.6
	SSCE	264	54.3
	Post SSCE	112	23
Occupation of the father	Artisan	72	14.8
	Businessman	99	20.4
	Civil servant	315	64.8
Mother's level of education	No formal education	73	15
	SSCE	294	60.5
	Post SSCE	119	24.5
Occupation of the mother	Artisan	135	27.8
	Businesswoman	187	38.5
	Civil servant	164	33.7
Number of children	One	270	56.6
	Two	111	23.1
	Three	62	12.8
	Four>	43	8.8
Number of relatives living with the caregiver	None	328	67.5
	One	140	28.8
	Two	18	3.7
Number of people sleeping with child in the same room.	One	89	18.3
	Two to three	175	36
	Four to five	222	45.6
Type of house	Room and parlour	177	36.4
	Single room	120	24.6
	Self- contained	113	23.3
	Flat	63	13
	Duplex	13	2.7
Relationship of respondent to child	Mother	464	95.5
	Father	1	0.2
	Other relations	21	4.3

4.3a Objective One: Prevalence of developmental Delay.

The overall prevalence of developmental delay in the children was found to be 23%. This means that out of the 486 children studied, 112 (23%) of them had developmental delay in one or more domain(s) of development according to ASQ.

4.3b Prevalence of developmental delay by domains

Figure 1 shows the prevalence of developmental delay by domains. Thirty four (30.4%) of the 112 children with developmental delay were delayed in fine motor skills.

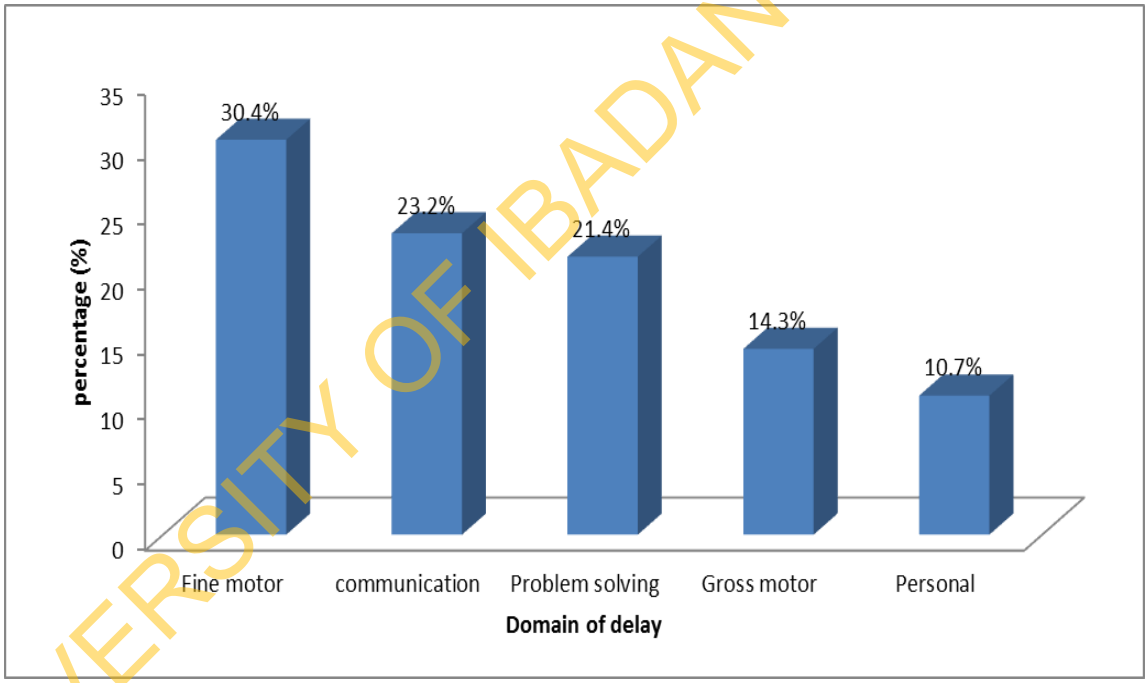

Figure 1: Prevalence of developmental delay by domains

4.4 Associations between child's socio- demographic characteristics and developmental delay

The Associations between child's socio- demographics and developmental delay are shown on Table 3. Having a pre-term gestational age (p< 0.045), being a male (p=0.001), having a middle birth order positions (p<0.001) and having a non- parent as the primary carer (p=0.010), were significantly associated with developmental delay while the age of the child at the time of the study was found to be statistically not significant.

Table 3: Associations between child's socio-demographic characteristics and developmental delay

Characteristics	Developmental delay				χ^2	Sig.
	Delay(N=112) n (%)	No delay(N=374) n (%)	Total	df		
Age of child						
< 12 months	11 (23.4%)	36 (76.6%)	47	4	.306	.989
12-23 months	41 (22.8%)	139 (77.2%)	180			
24-35 months	27 (23.9%)	86 (76.1%)	113			
36-47 months	18 (21.2%)	67 (78.8%)	85			
≥ 40 months	15 (24.6%)	46 (75.4%)	61			
Child's gestational age at birth						
< 9 months	15 (34.9%)	28 (65.1%)	43	1	3.728	**.045**
≥ 9 months	97 (21.9%)	346 (78.1%)	443			
Child's gender						
Male	71 (28%)	183 (72%)	254	1	7.226	**.001**
Female	41 (17.7%)	191 (82.3%)	232			
Child's birth order						
First	18 (6.7%)	252 (93.3%)	270	2	127.335	**.000**
Middle born	90 (52%)	83 (48%)	173			
Last born	4 (9.3%)	39 (90.7%)	43			
Relationship of child with respondent						
Parent						
Non parent	103 (22%)	365 (78%)	468	1	7.658	**.010**
	9 (50%)	9 (50%)	18			

Significant at p < 0.05

4.5 Associations between family characteristics and developmental delay

Table 4 shows associations between family characteristics and developmental delay. Increasing age of carers ($p<0.001$) and being married ($p=0.001$) are significantly associated with developmental delay. Compared to other ethnic group, a higher proportion of Igbo ethnicity ($p=0.001$) was observed to be significantly associated with developmental delay. Higher parental educational level ($p<0.001$) was significantly associated with developmental delay. Living in overcrowding environment with less than 3 rooms ($p=0.003$) and having a relative living within the house ($p=0.006$) were significantly associated with developmental delay.

Table 4: Associations between family characteristics and developmental delay

Characteristics	Developmental delay				χ^2	Sig.
	Delay (N= 112) n (%)	No delay (N= 374) n (%)	Total	df		
Age of caregiver						
<30years	13 (5.9%)	207 (94.1%)	220	1	96.982	**.001**
30-39years	48 (27.1%)	129 (72.9%)	177			
≥40years	51 (57.3%)	38 (42.7%)	89			
Marital status of caregivers						
Single	15 (12.5%)	105 (87.5%)	120	1	9.992	**.001**
Married	97 (26.5%)	269 (73.5%)	366			
Family setting						
Monogamous	93 (23.5%)	303 (76.5%)	396	1	.233	.371
Polygamous	19 (21.1%)	71 (78.9%)	90			
Religion						
Islam	44 (19.6%)	176 (80.4%)	219	1	2.393	.075
Christianity	68 (25.6%)	198 (74.4%)	266			
Ethnicity						
Igbo	36 (40%)	54 (60%)	90	1	22.450	**.000**
Yoruba	52 (21.8%)	187 (78.2%)	239			
Hausa	5 (8.5%)	43 (91.5%)	47			
Others	19 (17.4%)	90 (82.6%)	109			
Mother's education						
No formal education	6 (7.7%)	72 (92.3%)	78	2	22.116	**.000**
Minimum of SSCE	63 (21.8%)	226 (78.2%)	289			
Above SSCE	43 (36.1%)	76 (63.9%)	119			
Mother Occupation						
Artisan	36 (26.7%)	99 (73.3%)	135	1	2.695	.260
Businesswoman	45 (24.1%)	142 (75.9%)	187			
Civil servant	31 (18.9%)	133 (81.1%)	164			
No of children						
Less than 3 children	54 (31.2%)	119 (68.8%)	173	1	10.107	**.000**
≥ 3 children	58 (18.5%)	255 (81.5%)	313			
Father's education						
No formal education	7 (6.4%)	103 (93.6%)	110	2	50.204	**.000**
Minimum of SSCE	54 (20.5%)	210 (79.5%)	264			
Above SSCE	51 (45.5%)	61 (54.5%)	112			
Father Occupation						
Artisan	19 (26.4%)	53 (73.6%)	72	1	3.118	.210
Businessman	26 (17.9%)	119 (82.1%)	145			
Civil servant	67 (24.9%)	202 (75.1%)	269			
Relatives living within						
No	64(19.5%)	264 (80.5%)	328	1	7.101	**.006**
Yes	48 (30.4%)	110 (69.6%)	158			
Sleeping in a room with child						
Less than 3						
4 persons or more	55(20.8%)	209 (79.2%)	264	1	1.594	.124
	57 (25.7%)	165 (74.3%)	222			
Type of house						
Single room, room & Parlour	80(27.4%)	212 (72.6%)	292	1	7.812	**.003**
3 rooms and above	32 (16.5%)	162 (83.5%)	194			

Significant at $p < 0.05$

4.6 Baseline Score of Respondents to psychosocial questionnaires

Table 5 shows the frequency distribution of the respondents (primary caregivers) to psychosocial questionnaires. The mean score in S-F 8 was found to be 20.84 ± 4.79. Physical component had a mean of 10.92 ± 2.11 while that of mental component was found to be 9.91 ± 3.79. Three hundred and forty-four (70.8%) of the respondents were found to have minimal symptoms of depression to minor depression according to the classifications of Patient Health Questionnaire (PHQ-9). Two hundred and fifty-five (52.5%) were found to have moderate social support in Oslo-3 Social Support Questionnaire. Using Short Form Questionnaire (SF-8), 246 (50.6%) was found to have poor physical and emotional health. When dichotomised, 294 (60.5%) showed good physical health and 249 (57.2%) of them were found to have good mental health.

Table 5: Baseline scores of psychosocial factors N=486

Characteristics	**Frequency** n	**Percentage** %
PHQ - 9		
No symptom	136	27.9
Minimal-minor depression	344	70.8
Major-severe depression	6	1.3
OSLO		
Poor social support	208	42.8
Moderate social support	255	52.5
Strong social support	23	4.7
SF-8		
Poor	246	50.6
Good	240	49.4
Physical component – SF-8		
Poor	192	39.5
Good	294	60.5
Mental component – SF-8		
Poor	237	48.8
Good	249	57.2

4.7 Associations between Psychosocial factors and Developmental Delay

Psychosocial factors associated with developmental delay are higher depressive symptoms (p=0.001) and poor social support (p=<0.001).

Table 6: Psychosocial factors and developmental delay

Characteristics	Developmental delay					Sig.
	Delay (N= 112) n %	No delay (N= 374) n %	Total	df	χ^2	
PHQ-9						
No symptom	33 (24.3%)	103 (75.7%)	136	2	12.867	**.002**
Minimal-minor depression	74 (21.5%)	270 (78.5%)	344			
Major-severe depression	5 (83.3%)	1 (16.7%)	6			
OSLO-3						
Poor social support	95 (45.7%)	113 (54.3%)	208	2	106.782	**.000**
Moderate social support	13 (5.1%)	242 (94.9%)	255			
Strong social support	4 (17.4%)	19 (82.6%)	23			
SF-8						
Poor	53(21.5%)	193(78.5)	246	1	.632	.246
Good	59(24.6)	181(75.4)	240			
Physical component – SF-8						
Poor	39 (20.3%)	153 (79.7%)	192	1	1.337	.148
Good	73 (24.8%)	221 (75.2%)	294			
Mental component – SF-8						
Poor	51 (21.5%)	186 (78.5%)	237	1	.608	.251
Good	61 (24.5%)	188 (75.5%)	249			

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Discussion

Developmental delay has been documented to be common in developing countries (Silberberg, 2001; Grantham-McGregor et al., 2007 and Engle et al., 2010). This study adopted a cross sectional study design to determine the family characteristics and psychosocial correlates of developmental delay among children five years and below in Oshodi, a suburban area in Lagos, with a mixture of low and middle income class individuals.

5.1.1 Socio demographic characteristics of the child

Two hundred and fifty two (51.8%) were males in this study, the age range of highest frequency is between 12-23months (37%) and almost all are product of term pregnancies (90.5%). This is because the population of the children under study is apparently healthy or normal children in the community. Majority of these children are the first born of their parents (55.6%) and most of the respondents (96.1%) were mothers to those children. The study findings were reflective of the naturalistic nature of the environment where mostly healthy children reside in the community with most primary caregivers being mothers.

5.1.2 Socio demographic characteristics of the caregivers

Most (36.4%) of these caregivers were within the age range of 30 to 39years, many of them (75.3%) were married in a monogamous family setting. This study had more Christians (54.7%) and area is mostly populated by Yoruba ethnic group (49.3%). Both the father and mother were mostly secondary school certificate holders 54.3%

and 60.5% respectively. Most of the respondents live in a room and parlour apartment, while the women were mostly in business (38.5%) depicting the suburban low income nature of the area.

5.1.3 Prevalence of developmental delay among the sample children

In this study, prevalence of developmental delay among the children under the age of 5 years was found to be 23% with highest prevalence in fine motor skill. The prevalence of developmental delay in this study is similar to report from previous studies. A lower prevalence of developmental delay was seen in the present study when compared with the work of Oguntoyinbo (2014) which found a prevalence of 26.4% with the use of Ages and Stages Questionnaire (ASQ) in the same age group of under-five children in Ota, Ogun State (Oguntoyinbo, 2014). However, the rate of developmental delay in the present study is lower than the prevalence of 44.6% found by Ajediran et al (2013) in rural community in Ghana, even as Ajediran et al also used ASQ to assess rate of developmental delay, the different rates may be as a result of different settings. The present study was conducted in a sub-urban setting in Nigeria while that by Ajediran et al. emanated from a rural community in Ghana.

5.1.4 Associations between Child characteristics and developmental delay.

The findings in this study show that male gender was significantly associated with developmental delay in children under the age of 5 years. This observation is similar to the report by Hediger et al. (2002) who found that developmental delay is significantly higher in boys than in girls. Similarly, Kernsjens et al. (2011) from the findings of their study found that developmental delay is 1.5 – 4.7 times more frequent in boys than in girls.

Similarly, the significant association between preterm age at birth and developmental delay is in keeping with the findings of other researchers (Delgado et al 2007; Badshai et al., 2008; Ajediran et al., 2013; Valla et al. 2015). Valla et al. (2015) found that developmental delay is common in preterm children and the risk increases with a decreasing gestation age (GA). This could be explained by the developmental stage of the central nervous system outside the conducive and nutritionally-rich environment of the uterus. A low birth weight and preterm delivery have been observed to be associated with developmental delay. The age of a child at birth could influence child health outcomes such as chances of survival, risk of medical complications, and timing for the achievement of development milestones.

5.1.5 Associations between family characteristics and developmental delay

Family characteristics found to be significantly associated with developmental delay in this study include increasing age of caregiver, being married, higher formal educational level of parent, and living environment of single room or a room and parlour and having relatives living within.

Increasing parental age is in tandem with previous research findings that older parental age of greater than 35 years is a risk factor for developmental delay and abnormality (Iwayama et al., 2011). The association of increasing parental age with developmental delay could be due to effect of biological factors on child development for example older parenting has been associated with the risk of pregnancy related outcomes like Downs Syndrome (Paddock C, 2010). Older parents are also associated with high blood pressure, diabetes with attendant depressive symptoms which will negatively impact the child's development (Max-Planck G, 2016).

Being married which was found to be significantly associated with developmental delay in this study is contrary to the research findings of Schneider et al. (2005) in their study on children living with single parent. Schneider et al. (2005) found out that growing up with only one parent has been associated with a number of negative outcomes. The finding in this study could be due to the possible effect of rapid urbanization of the study setting with adverse socio-economic circumstances which could account for the increasing involvement of married women in in sustenance of the family thereby spending less time with their children. Single mothers on the other hand would usually take their children to stay with their grandparents or have an older close relative stay with them.

Surprisingly, a higher parental educational level was significantly associated with developmental delay. This finding is contrary to the work of Ajediran et al (2013) who discovered that higher parental/maternal education is associated with positive child development. However the result is similar to the previous research findings within and outside sub-Saharan Africa as exemplified in the research works of Delgado et al (2007) in Miami, Yaghini et al (2015) in Central Iran and Oguntoyinbo (2014) in Nigeria. The result could be due to a possible absence of the mother at home to provide quality childcare required for optimal development. The more educated mothers in sub-urban area like Oshodi would likely leave a pre-school child at home with child minders in contrast to their less educated ones, mostly artisans who are likely to take their children with them to their place of work.

An important finding from this study is that having a non-parent as primary care-giver was significantly associated with developmental delay. This observation is similar to findings from previous studies (Omolara, 2015; Chun Chen et al. 2004). Parents, especially mothers, are significant individuals for child development. The early

mother-child relationship is widely considered the foundation of children's later psychological and mental development (Collins et al., 2000). Parents, especially mothers, are significant individual caregivers for optimal child development. Having a child grow up with the mother is essential for physical, social, cognitive and emotional development.

Living in a single room, a room and parlour apartment with common kitchens, toilets and bathrooms and having one or more relatives living with the family were found to be significantly associated with developmental delay. Physical factors such as housing and neighbourhood quality have been documented in previous studies to influence child developmental outcome (Evans et al. 2001). A house with less than 3 rooms is more likely to be situated in a noisy and overcrowded part of the study location. Evans (2001) examined the effects of the physical environment on children's well-being and his work reveals that the effects of the physical environment such as noise level, overcrowding, and housing and neighborhood quality are associated with poor child developmental outcome.

5.1.6 Associations between psychosocial factors and developmental delay

Psychosocial factors found to be associated with developmental delay were higher depressive symptoms and poor social support.

The study observed that higher depressive symptoms in parents (moderate to severe depression) were significantly associated with developmental delay in the studied children. This finding is consistent with reports from previous studies (Warren and Smith, 2014). Psychological health of the parent, especially mother, has an important influence on child development for instance; maternal depression has a negative effect on a developing child. A depressed mother may neglect and become unresponsive to

the child with negative consequences on child's development. Warren and Smith (2014) posit that stimulation of the brain is heavily dependent on the interaction between the child and the immediate caregiver. How mother responds to signal from the child will influence how the child's brain develops. He also discovered that children of low responsive mothers are likely to show – poor physical health development, difficulties in cognitive, language, social and emotional functioning.

There was a strong relationship between social support and developmental delay. This finding is similar to the work of Tough et al., (2010) who discovered that children of mothers who reported low social support were discovered to be significantly more likely to be at high risk for developmental problems. This observation of an association between social support and developmental delay could be a reflection of the importance of social and community support in the development of children especially in a suburban area with low social capital. A developing nation such as Nigeria has a few social amenities which are unevenly distributed and could affect a child developmental outcome.

5.1.7 Limitations

There are some limitations to this study. This study adopted a cross-sectional survey design due to the time constraints. This can be controlled for in future studies by using a combination of both quantitative and qualitative methods of data collection to get more empirical findings.

The caregivers' responses may have been associated with some recall bias and social desirability especially in the areas of maternal physical and mental wellbeing.

The study is limited to just two low income communities in Lagos state. For this reason, the result cannot be generalized across all socio income groups in Lagos State.

The sample size is also moderately small for this community survey. This is because of time constraint as a result of short duration of the CAMH programme.

Lastly, some of the instruments used for this study have not been validated in Nigeria. This also limit generalizability of this study.

5.2 Conclusions

The findings of this study showed that developmental delay is prevalent in children under the age of five years in these communities in Lagos State with highest prevalence in fine motor domain. Secondly, it showed that family characteristics have significant association with development delay in the children. Thirdly, this study concludes that of the psycho-social factors studied, maternal depression and poor social support tend to be significantly associated with developmental delay. Child development could be influenced by the synergistic effects of the family, environment, social structures, interactive bonding and emotional nurturance from caregivers that work to nurture proper child development.

5.3 Recommendations

The following recommendations are made:

1. There should be organised systematic developmental screening of young children with their caregivers to detect those at risk for deviation from normal. This should form an integral part of Child Welfare Clinic.
2. There should be a large scale studies on the prevalence of developmental delay across the nation to determine the magnitude of the problem and the most occurring domain of development implicated. This will help policy makers in developing programmes and orientations to help out.
3. There should be a follow- up and an intervention programme for those children identified as developmentally delayed.
4. There is need for multi-sectorial approach in providing solution to the dearth of social support/ capital especially as Nigerian families are losing the gains of communal living to nuclear system.

Finally, as part of efforts to alleviate day-to-day demands of raising a child with developmental delay, or creating opportunities for the child to make friends or participate in social activities, future research should investigate the potential benefits of early intervention, family and psychosocial characteristics that supports optimal development of children

REFERENCES

Abiola T., Udofia O., Zakari M. (2013). Psychometric properties of the 3-item Oslo Social Support Scale among clinical students of Bayero University Kano, Nigeria. *Malays J Psychiatry;* 22:32-41.

Adebamia O.J., Onigbindea O.M., Joel-Medewasea Y., Oyedejia A.G., and Afolabib A.A (2011). Neurological disorders among children in Osogbo, South Western Nigeria. *Journal of Paediatric Neurology*. 9:341-345.

Aina O F., Morakinyo O. (2005). Normative data on mental and motor development in Nigeria children. West African Journal of Medicine. Vol.24: 2.

Amato P (2001). Children of divorce in the 1990s In: An update of the Amato and Keith (1991): A meta-analysis. *Journal of Family Psychology* 15,355-370.

Badshal S., Mason L., McKelvie K., Payne R., Lisboa P. (2008). Risk factors for low birthweight in the public-hospitals at Peshawar: NNFP-Paskistan. *BMC Publ Health*, 8**:**197.

Bang K (2008). Analysis of risk factors in children with suspected developmental delays. *Proc. World Academy SciEng Technol*. 36:2070 – 3740.

Bellman M., Byrne O., Sege R (2013). Developmental assessment of children. *BMJ*. 346:e8687. doi: 10.1136/BMJ.8687.

Black J., Jones T., Nelson C., Greenbush W (1998). Neuronal plasticity and the developing brain. *Handbook of child and adolescent psychiatry*. New York: Wiley, 1. 31–53.

Bradley R, Corwyn R (2002). Socioeconomic status and child development. *Ann Rev Psychol.*53:371–99.

Blanchard L.T., Gurka M.J., Blackman J.A (2006). Emotional, developmental, and behavioral health of American children and their families. *A report from the 2003 national survey of children's health.Paediatrics.*117(6): e1202 - 12.

Boyle C.A., Boulet S., Schieve L.A., Cohen R.A., Blumberg S.J., Yeargin-Allsop M., Yissa S.,Kogan M.D (2011). Trends in the prevalence of developmental disabilities in US children. *American Academy of Paediatrics*: 1997-2008

Braveman P.A., Cubbin C., Egerter S (2005). Socioeconomic Status in Health Research: One size does not fit all. *JAMA*. 294(22):2879—88.

Briggs N (2008). Child development and developmental disorders in Nigeria: Prospects and challenges for the 21st Century, A Keynote Address: The exchange and linkage programme unit, University of Port Harcourt, Ebitimi Banigo Auditorium, University of Port Harcourt.

Burton K.J, and Allen S (2003). A Review of Neurological Disorders Presenting at a Paediatric Neurology Clinic and Response to Anticonvulsant Therapy in Gambian children. *Annals of Tropical Paediatrics*, 23, 139-143.

Campbell F.A., Ramey C.T., Pungello E., Sparling J., Miller-Johnson S (2002. Early childhood Education: young adult outcomes from the Abecedarian Project. *Applied Developmental Science.* 6:42-57.

Cederblad., Rahim S.I.A (1986). Effects of rapid urbanization on child behaviour and health in a part of Khartoum, Sudan-I .Socio-Economic Changes. *Social Science and Medicine,* 22(7) 713-721.

Chen I.C., Lee H.C., Yeh G.C., Lai C.H., and Chen S.C (2004). The relationship between parental concerns and professional assessment in developmental delay in infants and children: A hospital-based study. *Journal of the Chinese Medical Association,* 67, 239-244.

Chiu S (2004). Basic Approach to developmental delay. University of British Columba.

Dalgard O. S. (2009). Social support - Consequences for individual and society .*In: EUPHIX, EUphact.Bilthoven: RIVM, <http://www.euphix.org> EUphact\ Determinants of health\ environment\ Social support, 16 March 2009a; on: http://www.euphix.org/object_document/o5482n27411.html.*

Darwin C (1877). A Biographical sketch of an infant. *A Quartely Review of Psychology and Philosophy of Mind*. 2: 285-294.

Dawson G, Ashman S.B, Carver L.J (2000). The role of early experience in shaping behavioural and brain development and its implications for social policy. *Dev. Psychopathol* 12:695-712.

Davies D (2004). Child Development: A Practitioners Guide. New York: NY. Guilford Press.

Dickstein S., Seifer R., Albus K.E (2009). Maternal adult attachment representations across relationship domains and infant outcomes: The importance of family and couple functioning. *Attachment & Human Development.* 11:5-2.

Eapena V., Zoubeidib T., Yunisc F., Gururajd A.K., Sabrie S., Ghubasha R (2006). Prevalence and psychosocial correlates of global developmental delay in 3-year-old children in the United Arab Emirates. *J Psychosomatic Res.* 61:321 – 26.

Engle- Cliffs N, J. &Kendra C (2015). What is a developmental milestone? *Paediatrics* 101(1 Pt 1):12-8

Engle L.L., Black M.M., Behrman J.R (2007). Strategies to avoid the loss of developmental potential in more than 200 million children in the developing world. *Lancet.*369:229 – 42.

Evans, G.W (2006). Child development and the physical environment. *Annual Review of Psychology,*57, 423-451.

Evans G.W., Saegert S., Harris R (2001). Residential density and psychological health among children in low income families. *Environment and Behaviour,* 33 (2), 165-180.

Expert Panel on the 18 Month Well Baby Visit (2005). Getting it right at 18 months, making it right for a lifetime: Report of the expert panel on the 18 month well baby visit.

Glascoe F.P (2000). Early detection of developmental and behavioural problems. *Pediatr Rev* 21:272–9.

Gleitman H., Reisberg D., Gross J (2007). Psychology. (7). www.Norton& Inc. New York.

Gomby D.S., Larner M.B., Stevenson C.S., Lewit E.M, Behrman R.E (1995). Long-term outcomes of early childhood programs: Analysis and recommendations. *Future Child.* 5(3):6 - 24.

Grantham-McGregor S., Cheung Y.B., Cueto S., Glewwe P., Richter L., Strupp B., & The International Child Development Steering Group (2007). Developmental potential in the first 5 years for children in developing countries: Child development in developing countries. *Lancet.* 369: 60-70.

Guralnick M.J (1998). Effectiveness of early intervention for vulnerable children: a developmental perspective. *Am J Ment.Retard* 102:319-345.

Hertzman C. & Wiens M (1996). Child development and long-term outcomes: A population health perspective and summary of successful interventions. *Soc. Sci Med.* 43:1083-1095.

Hertzman C., Power C (2004). Child development as a determinant of health across the life course. *Current Paediatrics.*14:438-443.

Israel, G. D (1992). Determining sample size. Florida Cooperative Extension Services,

University of Florida. PEOD-6.

Iwuyama M., Kira R., Krukawa N., Sakai V., Torisu H., Sanefuli M.,Ishizuki Y., Nose Y., Matsumoto T., Hara T (2011). Parental age and child growth and development: Child health check up data. *Paediatric Int.* 53 (5) 709-14.

Kail & Robert V (2011). Children and their development: *My Development Lab. Series.* 6th edition.

Kendra C (2015). What is a developmental milestone? *Paediatrics* 101(1 Pt 1):12-8.

Kish L (1965). Survey Sampling. New York: John Wiley and Sons, Inc.

Kuo H.T., Muo C.H., Chang Y.T., Lin C.K (2015). Change in prevalence status for children with developmental delay in Taiwan: A Nationwide Population-based Retrospective Study. *Neuro psychiatr. Dis. Treat.* 11:1541-47.

Koverola C., Papas M.A., Pitts S., Murtaugh C., Black M.M., Dubowitz H (2005). Longitudinal investigation of the relationship among maternal victimization, depressive symptoms, social support, and children's behaviour and development. *J Interpers Violence* 20:1523-1546.

Kroenke, K., Spitzer, R.L., Williams, J.B. (2003). The Patient Health Questionnaire-2: validity of a two-item depression screener. *Medical Care*, 41:1284–92.

Kroenke, K. & Spitzer, R.L. (2002). The PHQ-9: A new depression and diagnostic severity measure. *Psychiatric Annals, 32*, 509-521

Learning Disabilities Association of America (1999).Early Identification-Cognitive Milestone. http://www.idonline.org/article/6042.

Liu D, Diorio J, Day J., Francis D., Meaney M (2000). Maternal care, Hippocampal synaptogenesis and cognitive development in rats. *Nat Neurosci* 3**:** 799–806.

Lopez V., Clifford T., Minnes P., Quellette-Kuntz H (2008). Parental Stress and Coping in Families of Children With and Without Developmental Delays. .*Journal of Intellectual Disabilities.*14(2).

Max-Planck G. (2016). Children of older mothers do better: The benefits associated with being born in a later year outweigh the biological risks associated with being born to an older mother. *Science Daily*, <www.sciencedaily.com/releases/2016/04/160412104810.htm>.

Meaney M (2001). Maternal care, gene expression, and the transmission of individual differences in stress reactivity across generations. .*Ann Rev Neurosci* 24**:** 1161–92.

Melson G.F., Ladd G.W., Hsu H.C (1993). Maternal support networks, maternal cognitions, and young children's social and cognitive development. .*Child Dev.* 64:1401-1417.

Mondela P., Selevan G.S., Gutter S., and Rice D (2002). Environmental factors associated with a spectrum of neurodevelopmental deficits. National Centre for Environmental Assessment, U.S. Environmental Protection Agency, Washington, D.C. Department of Epidemiology, School of Public Health, University of North Carolina at Chapel Hill. 8: 188 –197.

Mustard J.F (2006). Early child development and experience-based brain development: The Scientific Underpinnings of the Importance of Early Child Development in a Globalized World. Washington, DC: The Brooking Institution.

Nguefack S., Kamga K.K., Moifo B., Chiabi 1.E., Mah E., Mbonda E (2013). Causes of developmental delay in children of 5 to 72months old at the Child Neurology Unit of YaoundeGynaeco-Obstetric and Paediatric Hospital (Cameroon). *Open Journal of Paediatrics*, (3), 279-285.

Nord, C., Brimhall, D., & West, J (1997). Fathers' involvement in their children's schools, U.S. Department of Education. *National Center for Education Statistics (NCES)* 98-091, Washington, DC.

Oguntoyinbo B (2014). Prevalence and correlates of developmental delay in Ota, Ogun State. *Unpublished Dissertation* submitted in partial fulfillment of the requirement for MSc in Child and Adolescent Mental Health of University of Ibadan.

Ojediran I.B., Quartey J.N.A., Appiah L (2013). Screening for developmental delay among children attending Community Welfare Clinic in Ghana. *BMC Paediatrics J.* 3:119.

Omigbodun O., Dogra N., Esan O., Adedokun B. (2008). Prevalence and correlates of suicidal behavior among adolescents in Southwest Nigeria. *The International Journal of Social Psychiatry,* Vol. 54 No. 1 pp 34-46.

Peter M.C., Keibe D.A., Palmer F.B (1998). Classification of developmental delays. Seminars in Paediatric Neurology, 5, 2-14.

Petersen M.C., David A., Kube., Frederick B., Palmer (1998). Classification of developmental delays.5. (1), 2-14.http://dx.doi.org/10.1016/S1071-9091(98)80012-0.

Pinto-Meza, A., Serrano-Blanco, A., Penarrubia, M.T., Blanco, E, & Haro, J.M. (2005). Assessing depression in primary care with the PHQ-9: can it be carried out over the telephone? *Journal of General Internal Medicine, 20*(8): 738-42.

Poon J.K., LaRosa A.C., Pai G.S (2010). Developmental delay, timely identification and assessment. *Indian Paediatr.* 47(5):415 -422.

Rimal H.S., Archana-Pokharel A., Vijay Saha., ArunGiri., BasudhaGhimire., Shiva Raja., BijoyVerghease (2012). Burden of developmental and behavioural problems among children. A Descriptive Hospital Based Study. .*Journal of Nobel Medical College.* 3(1). 5**.**

Rice D., Barone S.J (2000). Critical periods of vulnerability for the developing nervous system: Evidence from Humans and Animal Models. *Environ Health Perspect.* 103 (Suppl 3):511–533.

Rodier P (2004). Environmental causes of central nervous system maldevelopment. *Paediatrics.*113**:** 1076–83.

Rosenzweig M.R., Wolpin K.I (1994). Are there increasing returns to the intergenerational production of human capital: Maternal Schooling and Child Intellectual Achievement? *J Hum Res.*29**:** 670–93.

Rost, K. & Smith, J. (2001). Retooling multiple levels to improve primary care depression treatment. *Journal of General Internal Medicine, 16*, 644-645.

Runyan D.K., Hunter W.M., Socolar R.R., Amaya-Jackson L., English D., Landsverk J., Dubowitz H., Browne D.H., Bangdiwala S.I., Mathew R.M.,Family S (2013-2015). The meaning and characteristics of family. Sociology Discussion.com.

Sameroff A.J (1998). Environmental risk factors in infancy. *Paediatrics*.102:1287 – 92.

Schneider B., Coleman J (1993). Parents, their children, and schools. Boulder CO: Westview Press.

Shonkoff J (2003). From neurons to neighborhoods: Old and New Challenges for Developmental and Behavioral Paediatrics. *Developmental and Behavioral Paediatrics*, 24 (1), 70 –76.

Squires J, & Bricker D (2009). Ages and Stages Questionnaires: A Parent- Completed Child Monitoring System. (3) Paul Brookes Publishing Co. Inc.

Siegler, DeLoache, Eisenberg (2015). An introduction to child development**:** How Children Develop. 3rd ed.

Simeonsson R.J., Leonardi M., Lollar D., Bjorck-Akesson E., Hollenweger J., and Martinuzzi A (2003). Applying the international classification of functioning, disability and health to measure childhood.Disability. .*Disability and Rehabilitation.* 42: 15-16

Simeonsson R. J (2000). Early Childhood Intervention: Toward a Universal Manifesto. .*Infants and Young Children*, 12, 4-9.

Simeonsson R.J, Sharp M.C (1992). Developmental delays.in: Hoekelman R.A, Friedman S.B, Nelson M.N, Siedel *H.M.* Primary Paediatric Case. 2nd ed. St Louis: Mosby- Year Book. 867-70.

Simeonsson R.J (2004). Child development in developing countries 1.School of Education and FPG Child Development Institute, University of North Carolina at Chapel Hill.

Spitzer R., Kroenke, K., Williams, J. (1999). Validation and utility of a self-report Version of PRIME-MD: the PHQ Primary Care Study. *Journal of the American Medical Association, 282*, 1737-1744.

Tough C.S, Siever J.E, Benzies K, Leew S, Johnston D.W (2010). Maternal well-being and it's association to risk of developmental problems in children at school entry. *Paediatric. BMC*: 10. 19.

Udegbe B, Oshinowo H, Balogun S, Sunmola J (2005). Psychology: Perspective in Human Behaviour.Department of Psychology, University of Ibadan, Nigeria.

Valla L.,Wentzel-Larsen T., Hofoss D.,Slinning K (2015). Prevalence of suspected developmental delays in early infancy: Results from a regional population-based longitudinal study. .*BMC Paediatr.* (15): 215.

Von der Lippe A.L (1999). The impact of maternal schooling and occupation on child-rearing attitudes and behaviours in low income neighborhoods in Cairo, Egypt. *International J. Beh. Dev.* 23(3) 703-729.

Walker S.P, Grantham-McGregor S.M (1990). Growth and development of West Indian children. Part 2: Development. *West Indian Med J*. 39**:** 12–19.

Walker S.P., Wachs T.D., Meeks- Gardner J., Lozoff B., Wasserman G.A., Pollitt E (2007). Child development: risk factors for adverse outcomes in developing countries. *The Lancet.* 369(9556):145–57.

Ware J., Kosinski M., Dewey J., Gandek B. (2001). *How to Score and Interpret Single-Item Health Status Measures:* A Manual for Users of the SF-8 Health Survey. Quality Metric. Boston

Warren C & Smith M (2014). From research to practice training course in sexual and reproductive health research: Maternal mental health and early childhood development: Part 2.Geneva Foundation for Medical Education and Research (GFMER).

Webb S, Monk C, Nelson C (2001). Mechanisms of postnatal neurobiological development: Implications for human development. *Dev Neuropsychol.* 19: 147–71.

Williams R & Clinton J (2011). Canadian Paediatric Society Early Years Task Force. Getting it right at 18 months: In support of an enhanced well -baby visit. .*Paediatric Child Health.* 16(10):647.

Willms J.D (2002). Vulnerable children: Findings from Canada's National Longitudinal Survey of Children and Youth Edmonton: University of Alberta Press.

World Health Organization (2008). The global burden of disease.. World Health Organization Press, Geneva.

Yaghini O., Kelishadi R., Keikha M., Niknam N., Sadeghi S E., Najafpour E.,Ghazavi M (2015). Prevalence of developmental delay in apparently normal preschool children in Isfahan, Central Iran. Iran. *J Child Neurol.* 9(3): 17–23. PMCID: PMC4577694.

Young H, Buckley A.E, Hamza B, and Mandarano C (1982). Milk and lactation: Some Social and Developmental Correlates among 1000. Infants.*Paediatrics,* 69(2) 169-175.

Yousafzai A.I., Pagedar S., Wirz S., Filteau S (2003). Beliefs about feeding practices and nutrition for children with disabilities among families in Dharavi, Mumbai. *International Journal of Rehabilitation Research.* 26(1) 33-41.

Appendix I

Developmental Milestones

Age	Psychosocial	Gross Motor	Fine Motor and Visual	Communication and Hearing
1 month	• Follows faces to the midline	• Moves all extremities equally• Lifts head when lying on stomach	• Opens hands spontaneously	• Startled by loud sounds• Cries• Quiets when fed and comforted
2 months	• Follows faces past the midline• Smiles responsively	• Lifts head up 45 degrees when on stomach	• Looks at own hand	• Makes baby sounds such as cooing, squealing and gurgling
3 months	•Recognizes mother• Smiles responsively	• Can support head for a few seconds when held upright	• Opens hands Frequently	• Responds to voices• Laughs
4 months	• Follows an object with eyes for 180 degrees• Regards own hand• Anticipates food on sight	• Bears weight on legs• Good neck control when pulled to sitting position• Lifts chest and supports self on elbows when lying on stomach	• Brings hands together in midline (clasps hands)• Grabs an object such as a rattle• Reaches for objects	• Turns head to sound
6 months	• Reaches for familiar people	• Rolls from stomach to back or back to stomach• Sits with anterior support	• Plays with hands by touching them together• Sees small objects such as crumbs	• Responds to name• Babbles
9 months	• Indicates wants• Waves “bye-bye”• Has stranger anxiety	• Can sit without support• Creeps or crawls on hands and knees	• Looks for a toy when it falls from his/her hand• Takes a toy in each hand• Transfers a toy from one hand to the other	• Responds to soft sounds such as whispers
9 months	• Indicates wants• Waves “bye-bye”• Has stranger anxiety	• Can sit without support• Creeps or crawls on hands and knees	• Looks for a toy when it falls from his/her hand• Takes a toy in each hand• Transfers a toy from one hand to the other	• Responds to soft sounds such as whispers

12 months	• Has separation anxiety• Social interactions are intentional and goal directed	• Pulls self-up to standing position• Walks with support	• Points at objects with index finger	• Says at least 1 word• Makes “ma-ma” or “da-da” sounds• Locates sounds by turning head
15 months	• Imitates activities• Finds a nearby hidden Object	• Can take steps on own• Can get to a sitting position from a lying position	• Can stack one cube on top of another	• Able to say “mama” and “dada” to respective parents (sounds to identify caretakers)
18 months	• Initiates interactions by calling to adult	• Walks without help	• Can take off own shoes• Feeds self	• Says at least 3 words
2 years	• Does things to please others• Engages in parallel(imitative) play	• Runs without falling	• Looks at pictures in a book• Imitates drawing a vertical line	• Combines 2 different words

Appendix II

SOCIO DEMOGRAPHIC QUESTIONNAIRE

CENTRE FOR CHILD AND ADOLESCENT MENTAL HEALTH.

UNIVERSITY OF IBADAN, IBADAN.

FAMILY CHARACTERISTICS AND PSYCHOSOCIAL CORRELATES OF DEVELOPMENTAL DELAY AMONG CHILDREN UNDER- FIVE YEARS OF AGE IN OSHODI, LAGOS.

Dear respondent,

I am a student of the above- institution conducting a research on the above topic. I promise that all information supplied will be treated as confidential and utilized for the purpose of this Research, hence no name is required.

SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE CHILD.

1. Child's age …….
2. Child's date of birth……..
3. Child's gestational age at birth…….
4. Child's Gender: Male Female…….
5. What is child's birth order…….
6. Who cares for the child most of the time? (a) Mother (b) Father (c) Grandmother (d) Other relatives (e) Employed helper

SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE CAREGIVER.

1. Age as at last birthday (please specify):----------
2. Religious Belief: (1) Islam (2) Christianity (3) Traditional (4) Other faith
3. Ethnic/tribe: (1) Yoruba (2) Igbo (3) Hausa (4) Other tribe

4. Marital Status: (a) Not yet married (b) Married (c) Separated/Divorced (d) Father is dead (e) Mother is dead (f) Mother & Father are dead

5. Family Type: (a) Monogamous (b) Polygamous

6. Level of Father's Education? (a) No Formal Education (b) Koranic School (c) Primary School (d) Secondary School (e) Post-secondary (Non-University) (f) University degree and above.

7. Occupation of Father: [Write the exact occupation] _____

8. Level of Mother's Education (a) No Formal Education (b) Koranic School (c) Primary school (d) Secondary School (e) Post-Secondary (Non-University) (f) University Degree and above.

9. Occupation of Mother: [Write in the exact occupation] _____

10. Any public tap water in the compound? (a) Yes (b) No

11. Which of these correctly describes the main source of drinking water for those living in your house? (a) Piped water (b) Public Tap (c) Bore Hole (d) Well (e) Sachet/Bottled water (f) others, please specify ----------

12. What kind of toilet facility does members of your household use? (a) Bush (b) Pit toilet (c) Bucket (d) Water Closet (e) Others Specify

13. What type of fuel does your household mainly use for cooking? (a) Electricity (b) Gas (c) Kerosene (d) Wood (e) Coal

14. Which of these best described your house? (a) Duplex (b) Flat (c) Self Contained (d) Room and Parlor (e) Single room (f) Uncompleted building (e) Others (specify) ……..

15. How many other relatives are living with you? (a) None (b) 1 (c) 2-3 (c) 4-5 (d) 6+

16. Relationship of the Respondent to the Child. (a) Mother. (b) Father(c). Grandmother (d) Others, please specify----------

Appendix III

ASQ-3 Ages & Stages Questionnaires®

2 Month Questionnaire

1 month 0 days through 2 months 30 days

Please provide the following information. Use black or blue ink only and print legibly when completing this form.

Date ASQ completed: ☐☐☐☐☐☐☐☐ (M M D D Y Y Y Y)

Baby's information

Baby's first name: | Middle initial: | Baby's last name:

Baby's date of birth: (M M D D Y Y Y Y)

If baby was born 3 or more weeks prematurely, # of weeks premature: ☐☐

Baby's gender: ◯ Male ◯ Female

Person filling out questionnaire

First name: | Middle initial: | Last name:

Street address:

Relationship to baby: ◯ Parent ◯ Guardian ◯ Teacher ◯ Child care provider ◯ Grandparent or other relative ◯ Foster parent ◯ Other: ☐

City: | State/Province: | ZIP/Postal code:

Country: | Home telephone number: | Other telephone number:

E-mail address:

Names of people assisting in questionnaire completion:

PROGRAM INFORMATION

Baby ID #:

Age at administration, in months and days: ☐☐ (M M) ☐☐ (D D)

Program ID #:

If premature, adjusted age, in months and days: ☐☐ (M M) ☐☐ (D D)

Program name:

E101020100

OVERALL (continued)

4. Has your baby had any medical problems? If yes, explain: ○ YES ○ NO

5. Do you have concerns about your baby's behavior (for example, eating, sleeping)? If yes, explain: ○ YES ○ NO

6. Does anything about your baby worry you? If yes, explain: ○ YES ○ NO

PERSONAL-SOCIAL

	YES	SOMETIMES	NOT YET	
1. Does your baby sometimes try to suck, even when she's not feeding?	○	○	○	—
2. Does your baby cry when he is hungry, wet, tired, or wants to be held?	○	○	○	—
3. Does your baby smile at you?	○	○	○	—
4. When you smile at your baby, does she smile back?	○	○	○	—
5. Does your baby watch his hands? 	○	○	○	—
6. When your baby sees the breast or bottle, does she seem to know she is about to be fed?	○	○	○	—

PERSONAL-SOCIAL TOTAL —

OVERALL

Parents and providers may use the space below for additional comments.

1. Did your baby pass the newborn hearing screening test? If no, explain: ○ YES ○ NO

2. Does your baby move both hands and both legs equally well? If no, explain: ○ YES ○ NO

3. Does either parent have a family history of childhood deafness, hearing impairment, or vision problems? If yes, explain: ○ YES ○ NO

ASQ-3

2 Month Questionnaire

FINE MOTOR

	YES	SOMETIMES	NOT YET	
1. Is your baby's hand usually tightly closed when he is awake? (*If your baby used to do this but no longer does, mark "yes."*)	○	○	○	___
2. Does your baby grasp your finger if you touch the palm of her hand? 	○	○	○	___
3. When you put a toy in his hand, does your baby hold it in his hand briefly? 	○	○	○	___
4. Does your baby touch her face with her hands?	○	○	○	___
5. Does your baby hold his hands open or partly open when he is awake (rather than in fists, as they were when he was a newborn)? 	○	○	○	___*
6. Does your baby grab or scratch at her clothes?	○	○	○	___

FINE MOTOR TOTAL ___

**If Fine Motor item 5 is marked "yes," mark Fine Motor item 1 as "yes."*

PROBLEM SOLVING

	YES	SOMETIMES	NOT YET	
1. Does your baby look at objects that are 8–10 inches away?	○	○	○	___
2. When you move around, does your baby follow you with his eyes?	○	○	○	___
3. When you move a toy slowly from side to side in front of your baby's face (about 10 inches away), does your baby follow the toy with her eyes, sometimes turning her head?	○	○	○	___
4. When you move a small toy up and down slowly in front of your baby's face (about 10 inches away), does your baby follow the toy with his eyes?	○	○	○	___
5. When you hold your baby in a sitting position, does she look at a toy (about the size of a cup or rattle) that you place on the table or floor in front of her?	○	○	○	___
6. When you dangle a toy above your baby while he is lying on his back, does he wave his arms toward the toy? 	○	○	○	___

PROBLEM SOLVING TOTAL ___

E101020300

ASQ-3

2 Month Questionnaire

1 month 0 days through 2 months 30 days

On the following pages are questions about activities babies may do. Your baby may have already done some of the activities described here, and there may be some your baby has not begun doing yet. For each item, please fill in the circle that indicates whether your baby is doing the activity regularly, sometimes, or not yet.

Important Points to Remember:

- ☑ Try each activity with your baby before marking a response.
- ☑ Make completing this questionnaire a game that is fun for you and your baby.
- ☑ Make sure your baby is rested and fed.
- ☑ Please return this questionnaire by _____.

Notes:

_____

_____

_____

_____

COMMUNICATION

	YES	SOMETIMES	NOT YET	
1. Does your baby sometimes make throaty or gurgling sounds?	○	○	○	—
2. Does your baby make cooing sounds such as "ooo," "gah," and "aah"?	○	○	○	—
3. When you speak to your baby, does she make sounds back to you?	○	○	○	—
4. Does your baby smile when you talk to him?	○	○	○	—
5. Does your baby chuckle softly?	○	○	○	—
6. After you have been out of sight, does your baby smile or get excited when she sees you?	○	○	○	—

COMMUNICATION TOTAL —

GROSS MOTOR

	YES	SOMETIMES	NOT YET	
1. While your baby is on his back, does he wave his arms and legs, wiggle, and squirm?	○	○	○	—
2. When your baby is on her tummy, does she turn her head to the side?	○	○	○	—
3. When your baby is on his tummy, does he hold his head up longer than a few seconds?	○	○	○	—
4. When your baby is on her back, does she kick her legs?	○	○	○	—
5. While your baby is on his back, does he move his head from side to side?	○	○	○	—
6. After holding her head up while on her tummy, does your baby lay her head back down on the floor, rather than let it drop or fall forward?	○	○	○	—

GROSS MOTOR TOTAL —

E101020200

ASQ-3 Ages & Stages Questionnaires®

57 months 0 days through 66 months 0 days

60 Month Questionnaire

Please provide the following information. Use black or blue ink only and print legibly when completing this form.

Date ASQ completed: M M D D Y Y Y Y

Child's information

Child's first name: | Middle initial: | Child's last name:

Child's date of birth: M M D D Y Y Y Y

Child's gender: ◯ Male ◯ Female

Person filling out questionnaire

First name: | Middle initial: | Last name:

Street address:

Relationship to child: ◯ Parent ◯ Guardian ◯ Teacher ◯ Child care provider ◯ Grandparent or other relative ◯ Foster parent ◯ Other:

City: | State/Province: | ZIP/Postal code:

Country: | Home telephone number: | Other telephone number:

E-mail address:

Names of people assisting in questionnaire completion:

PROGRAM INFORMATION

Child ID #:

Program ID #:

Program name:

E101600101

ASQ-3

60 Month Questionnaire

57 months 0 days through 66 months 0 days

On the following pages are questions about activities children may do. Your child may have already done some of the activities described here, and there may be some your child has not begun doing yet. For each item, please fill in the circle that indicates whether your child is doing the activity regularly, sometimes, or not yet.

Important Points to Remember:

- ☑ Try each activity with your child before marking a response.
- ☑ Make completing this questionnaire a game that is fun for you and your child.
- ☑ Make sure your child is rested and fed.
- ☑ Please return this questionnaire by _____.

Notes:

_____

_____

_____

_____

COMMUNICATION

	YES	SOMETIMES	NOT YET	
1. Without your giving help by pointing or repeating directions, does your child follow three directions that are *unrelated* to one another? Give all three directions before your child starts. For example, you may ask your child, "Clap your hands, walk to the door, and sit down," or "Give me the pen, open the book, and stand up."	○	○	○	—
2. Does your child use four- and five-word sentences? For example, does your child say, "I want the car"? Please write an example:	○	○	○	—
3. When talking about something that already happened, does your child use words that end in "-ed," such as "walked," "jumped," or "played"? Ask your child questions, such as "How did you get to the store?" ("We walked.") "What did you do at your friend's house?" ("We played.") Please write an example:	○	○	○	—
4. Does your child use comparison words, such as "heavier," "stronger," or "shorter"? Ask your child questions, such as "A car is big, but a bus is _____" (bigger); "A cat is heavy, but a man is _____" (heavier); "A TV is small, but a book is _____" (smaller). Please write an example:	○	○	○	—

E101600201

COMMUNICATION (continued)

	YES	SOMETIMES	NOT YET	
5. Does your child answer the following questions? *(Mark "sometimes" if your child answers only one question.)*	○	○	○	___

"What do you do when you are hungry?" *(Acceptable answers include "get food," "eat," "ask for something to eat," and "have a snack.")* Please write your child's response:

"What do you do when you are tired?" *(Acceptable answers include: "take a nap," "rest," "go to sleep," "go to bed," "lie down," and "sit down.")* Please write your child's response:

6. Does your child repeat the sentences shown below back to you, without any mistakes? *(Read the sentences one at a time. You may repeat each sentence one time. Mark "yes" if your child repeats both sentences without mistakes or "sometimes" if your child repeats one sentence without mistakes.)*	○	○	○	___

Jane hides her shoes for Maria to find.

Al read the blue book under his bed.

COMMUNICATION TOTAL ___

GROSS MOTOR

	YES	SOMETIMES	NOT YET	
1. While standing, does your child throw a ball overhand in the direction of a person standing at least 6 feet away? To throw overhand, your child must raise his arm to shoulder height and throw the ball forward. *(Dropping the ball or throwing the ball underhand should be scored as "not yet.")* 	○	○	○	___
2. Does your child catch a large ball with both hands? *(You should stand about 5 feet away and give your child two or three tries before you mark the answer.)* 	○	○	○	___
3. Without holding onto anything, does your child stand on one foot for at least 5 seconds without losing her balance and putting her foot down? *(You may give your child two or three tries before you mark the answer.)* 	○	○	○	___

GROSS MOTOR (continued)

	YES.	SOMETIMES	NOT YET	
4. Does your child walk on his tiptoes for 15 feet (about the length of a large car)? *(You may show him how to do this.)*	○	○	○	—
5. Does your child hop forward on one foot for a distance of 4–6 feet without putting down the other foot? *(You may give her two tries on each foot. Mark "sometimes" if she can hop on one foot only.)*	○	○	○	—
6. Does your child skip using alternating feet? *(You may show him how to do this.)*	○	○	○	—

GROSS MOTOR TOTAL —

FINE MOTOR

	YES	SOMETIMES	NOT YET	
1. Ask your child to trace on the line below with a pencil. Does your child trace on the line without going off the line more than two times? *(Mark "sometimes" if your child goes off the line three times.)*	○	○	○	—
2. Ask your child to draw a picture of a person on a blank sheet of paper. You may ask your child, "Draw a picture of a girl or a boy." If your child draws a person with head, body, arms, and legs, mark "yes." If your child draws a person with only three parts (head, body, arms, or legs), mark "sometimes." If your child draws a person with two or fewer parts (head, body, arms, or legs), mark "not yet." Be sure to include the sheet of paper with your child's drawing with this questionnaire.	○	○	○	—
3. Draw a line across a piece of paper. Using child-safe scissors, does your child cut the paper in half on a more or less straight line, making the blades go up and down? *(Carefully watch your child's use of scissors for safety reasons.)* 	○	○	○	—
4. Using the shapes below to look at, does your child copy the shapes in the space below without tracing? *(Your child's drawings should look similar to the design of the shapes below, but they may be different in size. Mark "yes" if she copies all three shapes; mark "sometimes" if your child copies two shapes.)*	○	○	○	—

(Space for child's shapes)

E101600401

FINE MOTOR (continued)

	YES	SOMETIMES	NOT YET	
5. Using the letters below to look at, does your child copy the letters without tracing? Cover up all of the letters except the letter being copied. *(Mark "yes" if your child copies four of the letters and you can read them. Mark "sometimes" if your child copies two or three letters and you can read them.)*	○	○	○	___

V H T C A

(Space for child's letters)

6. Print your child's first name. Can your child copy the letters? The letters may be large, backward, or reversed. *(Mark "sometimes" if your child copies about half of the letters.)*	○	○	○	___

(Space for adult's printing)

(Space for child's printing)

FINE MOTOR TOTAL ___

PROBLEM SOLVING

	YES	SOMETIMES	NOT YET	
1. When asked, "Which circle is smallest?" does your child point to the smallest circle? *(Ask this question without providing help by pointing, gesturing, or looking at the smallest circle.)*	○	○	○	___

2. When shown objects and asked, "What color is this?" does your child name five different colors like red, blue, yellow, orange, black, white, or pink? *(Mark "yes" only if your child answers the question correctly using five colors.)*	○	○	○	___

PROBLEM SOLVING (continued)

	YES	SOMETIMES	NOT YET	
3. Does your child count up to 15 without making mistakes? If so, mark "yes." If your child counts to 12 without making mistakes, mark "sometimes."	○	○	○	___
4. Does your child finish the following sentences using a word that means the opposite of the word that is italicized? For example: "A rock is *hard*, and a pillow is *soft*."	○	○	○	___

Please write your child's responses below:

A cow is *big*, and a mouse is _____

Ice is *cold*, and fire is _____

We see stars at *night*, and we see the sun during the _____

When I throw the ball *up*, it comes _____

(Mark "yes" if he finishes three of four sentences correctly. Mark "sometimes" if he finishes two of four sentences correctly.)

5. Does your child know the names of numbers? *(Mark "yes" if she identifies the three numbers below. Mark "sometimes" if she identifies two numbers.)*	○	○	○	___

3 1 2

6. Does your child name at least four letters in her name? Point to the letters and ask, "What letter is this?" *(Point to the letters out of order.)*	○	○	○	___

PROBLEM SOLVING TOTAL ___

PERSONAL-SOCIAL

	YES	SOMETIMES	NOT YET	
1. Can your child serve himself, taking food from one container to another, using utensils? For example, does your child use a large spoon to scoop applesauce from a jar into a bowl?	○	○	○	___
2. Does your child wash her hands and face using soap and water and dry off with a towel without help?	○	○	○	___
3. Does your child tell you at least four of the following? Please mark the items your child knows.	○	○	○	___

- ○ a. First name
- ○ b. Age
- ○ c. City he lives in
- ○ d. Last name
- ○ e. Boy or girl
- ○ f. Telephone number

E101600601

PERSONAL-SOCIAL (continued)

	YES	SOMETIMES	NOT YET	
4. Does your child dress and undress himself, including buttoning medium-size buttons and zipping front zippers?	○	○	○	—
5. Does your child use the toilet by herself? *(She goes to the bathroom, sits on the toilet, wipes, and flushes.)* Mark "yes" even if she does this after you remind her.	○	○	○	—
6. Does your child usually take turns and share with other children?	○	○	○	—

PERSONAL-SOCIAL TOTAL —

OVERALL

Parents and providers may use the space below for additional comments.

1. Do you think your child hears well? If no, explain: ○ YES ○ NO

2. Do you think your child talks like other children.her age? If no, explain: ○ YES ○ NO

3. Can you understand most of what your child says? If no, explain: ○ YES ○ NO

4. Can other people understand most of what your child says? If no, explain: ○ YES ○ NO

E101600701

OVERALL (continued)

5. Do you think your child walks, runs, and climbs like other children his age? ○ YES ○ NO
If no, explain:

6. Does either parent have a family history of childhood deafness or hearing impairment? If yes, explain: ○ YES ○ NO

7. Do you have any concerns about your child's vision? If yes, explain: ○ YES ○ NO

8. Has your child had any medical problems in the last several months? If yes, explain: ○ YES ○ NO

9. Do you have any concerns about your child's behavior? If yes, explain: ○ YES ○ NO

10. Does anything about your child worry you? If yes, explain: ○ YES ○ NO

E101600801

Appendix IV

PATIENT HEALTH QUESTIONNAIRE – 9 (PHQ-9)

Please tick as necessary.

Over the past two weeks how often have been disturbed by the following problems?	**Not at all (0)**	**Several Days (1)**	**More than half the days (2)**	**Nearly everyday (3)**
1. Little or no pleasure in doing things				
2. Feeling down, depressed or hopeless				
3. Trouble falling asleep, staying asleep or sleeping too much.				
4. Feeling tired or having little energy.				
5. Poor appetite or over eating.				
6. Feeling bad about yourself or that you are a failure or have let your family or yourself down.				
7. Trouble concentrating on things such as reading the newspaper or watching television.				
8. Moving or speaking so slowly that other people could have noticed or the opposite-being so fidgety or restless that you having moving around a lot more than usual.				
9. Thoughts that you would be better off dead or of hurting in some ways				
Column Total				

Add Column Total Together

_____

If you checked off any problems, how difficult have those problems made it for you to do work, take care of things at home, or get along with other people? (a) Not difficult at all (b) Somewhat difficult (c) Very difficult (d) Extremely difficult

Appendix V

SF-8 Health Survey Questionnaire

Please tick as necessary.

1. Overall, how would you rate your physical health during the past 4 weeks?
   (a) Excellent (b) Very good. (c) Good (d) Fair (e) Poor (f) Very Poor.
2. During the past 4 weeks, how much did physical health problems limit your usual physical activities (such as walking or climbing stairs)?
   (a) Not at all (b) A little Bit (c) Some (d)Quite a Lot (e) Could Not Do Physical Activities
3. During the past 4 weeks, how much difficulty did you have doing your daily work, both at home and away from home, because of your physical health?
   (a) Not at all (b) A Little Bit (c) Some (d) Quite a Lot (e) Could Not Do Daily Work
4. How much bodily pain have you had during the past 4 weeks?
   (a) None (b) Very Mild (c) Mild (d) Moderate (e) Severe (f) Very Severe
5. During the past 4 weeks, how much energy did you have?
   (a)Very much (b) Quite a Lot (c) Some (d) A Little (e) None
6. During the past 4 weeks, much did your physical health or emotional problems limit your usual social activities with family or friends?
   (a) None At All (b) Very Mild (c) Mild (d) Moderate (e) Severe (f) Very Severe
7. During the past 4 week, how much have you been bothered by emotional problems (such as feeling anxious, depressed or irritable)?
   (a) None At All (b) Slightly (c) Moderately (d) Quite A lot (e) Extremely
8. During the past 4 weeks, how much did personal or emotional problems keep you from doing your usual work, school or other daily activities?
   (a) None at all (b) Very Little (c) Somewhat (d) Quite A lot (e) Could Not Do Daily Activities.

Appendix VI

OSLO-3 Items Social Questionnaire

Please tick as necessary.

1. How easy can you get help from neighbours if you should need it? (a). Very easy (b) Easy (c) Possible (d) Difficult (e) Very difficult
2. How many people are so close to you that you can count on them if have serious problems (a) None (b) 1- 2 (c) 3-5 (d) 5+
3. How much concern do people show in what you are doing? (a) A lot (b) Some (c) Uncertain (d) Little (e) None.

Appendix VII

Translation of the questionnaires to Local Language (Yoruba)

Socio-demographic characteristics of the child

1. Ojo ori omo……
2. Ojo ibi omo…….
3. Osu melo ni olo ninu……
4. Obirin abi okurin……
5. Omo melo letibi keto bi eleyi…….
6. Ta lo ntoju omo na ni opolopo igba? (a) iya (b) baba (d) iya agba (e) ebi miran (e)oluranlowo ti o ngbo wo ise

Socio-demographic characteristics of the caregiver.

AWON ORO TI O JE MO ISE ATI ISESI AWON OPO ENIYAN (BI IYE OMO BIBI ATI AWON TI O KU).

1. Ojo ori ni igba ojo-ibi ti o kehin (Jowo so pato)…….

2. Esin ti o gbagbo (i) Islam, (ii) Igbagbo (iii) Esin ibile, ifa, ogun, shango, Oya (iv) Esin miran (jowo ko won si ibi)

3. Ile ti a bi ni eya (i) Yoruba (ii) Igbo (iii) Hausa (iv) Eya miran (jowo ko si ibi……)

4. Ipo igbeyawo (a) ko i ti gbeyawo (b) o ti gbeyawo (d) o ti ya soto/o ti ko oko/ko yawo sile (e) baba ti ku (e) iya ti ku (f) mama ati baba ti ku

5. Iru ebi wo (a) oniyawo kan (b) oniyawo pupo

6. Iwe melo ni baba ka? (a) ko ka iwe gidi kan (b) o lo ile iwe keu (Kurani) (d) o ka iwe mefa (e) o ka iwe mewa (e) o ka ju iwe mewa lo (ko de unifasititi) (f) o lo ile iwe giga unifasiti

7. Ise ti baba nse gangan (ko ise yen gangan)……..

8. Ibo ni mama ka iwe de (a) ko ka iwe gidi kan (b) o lo ile iwe keu abi ti Kurani (d) o ka iwe mefa (e) o ka iwe mewa (e) o ka ju iwe mewa lo (ko de unifasititi) (f) o lo ile iwe giga unifasiti

9. Kini ise iya gangan (E so ise yen gan)……

10.Nje eni omi ero ninu ogba yin? (a) owa (b) kosi.

11. E le wo lo si gidi ibi ti e ti ma nri omi mumu mu ninu ile yin? (a) omi ero (b) omi ero ti ijoba (d) omi kanga d'ero tin won gbe (e) omi kanga (e) omi fifomo ninu apo ora abi inu igo (f) iru miran, so aso ye

12. Iru ile igbe wo ni awon ara ile yin nlo? (a) inu igbo (b) ile igbe tin won gbe koto (d) ile igbe tin won nlo garawa (e) ile igbe igbalode ti o mi nfo da nu (e) iru miran, e salaye gan

13. Kini ohun ti e fi da ina ounje ninu ile yin (a) ina oba (elentriki) (b) ina oru gaasi (d) kerosene (e) igi idana (e) eedu

14. E wo lo se apejuwe ile ti e ngbe daradara julo? (a) iyaara meji po (b) ile flati (palo, awon iyara, ile igbe, idana ati ile iwe (d) iyara eyo kan, palo ati ile igbe ile idana ati ile iwe (e) palo ati yara kan papo (e) eyo iyara kan (f) ile ti a o ti ko pari (g)iru de miran so iru re gan-an

15. Awon ebi melo miran lo mba gbe pelu re? (a) ko s'enikan (b) ebi meji si meta (d) ebi merin si marun (e) mefa tabi ju be lo

Ipo ti omo wa larin awon omo baba re……...

16. Eniyan melo ni nsun ninu iyara kan pelu omo kan (a) eni kan (b) odun meji ati meta (d) odun merin si marun (e) odun mefa ati ju be lo

17. Kini ese je si omo yi? (a) iya (b) baba (c) omo omo (d) ati bebe lo.

…….

Ages and Stages Questionnaire

IDARI: Jowo fi ami toto si bi o ti ye

Gbiyanju e pelu omo re ki oto dahun ibere yi. Dahun ibere yi lona tole pa omo re lerin.

Ripe omo e wa ni ipo ti odara, ki ojeun ki osu dara dara.Ipo ti otun tele awon nkan ti omo tule ti mase, ati awon nkan emi ti koiti mase.

Se omo e ti nse awon kan wonyi lera lera, abi ko yi ki mase rara, abi nigbami.

Opolopo omo ni ko kin fe se nigbami, afi ta ban se fun ni gbogbo igba. Toba sese nigba to ba n sese pelu wa atun se fun. Ti omo e ba le se sugbon ti ko se, fi amin ‘beni’.

IWE IBERE ALAFIA ALAISAN

IDARI: Jowo fi ami toto si bi o ti ye

Ni bi ose meji sehin, bawo ni a se ti daa laamu to nipa awon isoro wonyi ti o tele ra won? Jowo fi ami tito si bi oba ti ba mu:

Rara rara; opolopo ojo = ojo kan le si abo awon ojo = o fe je bi emeji = meta 0 1 2 3

1. Aini igbadun kekere abi aini igbadun rara ninu sise nkan

2. Bi ki emi eni ko re le pata, abi ki inu eni ba je abi ki a so ireti nu patapata

3. Idaamu lati ri orun sun, mi ma wa ni sisin, abi ki eniyan sun pupo ju

4. Ri reni gidigidi abi ki oni agbara kekere

5. Ai le jeun daada abi ki o jeun a jeju

6. Mima dun nu si ara eni abi koro wipe on ti sina, on ti ni ijakule laiye abi pe ki o ro pe on ti ja ebi on abi ara o n ti e laiye yi

7. Ki o ma ni isaro lati t era moa won nkan bi iwe irohin ni kika abi lati wo ero amuhun maworan

8. Mimaa rin kini diedie abi ki o ma soro lai ja fafa to be ti awon elomiran ti lee fu ra si eni abi ni ida keji oro ki o ma gbon pepe, ki o ma lee ma ra duro daradara abi ki o se eni yen bi pe o ti kiri kakiri juu bi o ti yelo.

9. Ero wipe nje ko ni dara pe ki o n ti ku ju ki o n wa laiye lo abi ki nkan sa ti pa o n lara sa lona kan

10. Ti o ba ti nse ayewo awon isoro kankan. Ba wo ni awon isoro yi ti mu soro fun o to lati se ise; lati to ju nkan ni ile abi lati ba awon eniyan miran sise papo? (a) ko soro pupo rara (b) o soro die (d) o soro gidigidi (e) o soro pata pata

IWE IBERE ILERA ALAISAN

Fi ami si bo ti ye

1. Lakotan, ipo wo ni o le fi ilera re si ni nkan bi osu kan si igba ti a wa yi?

a) o tayo (b) a dara pupo (d) o dara (e) o dara die (e) ko dara (f) ko dara rara

2. Larin ose merin sehin, bawo ni isoro re tipo to ni sise ise ni ojujumo, ni ati ile ati kuro ni ile nitori awon nkan fifara se bi nirin abi gigun ategun lo soke losi ile?

(a) ra ra ra ra (b) isoro kekere (c) o dara die (d) ko dara (e) ko le se ise

3. Larin ose merin sehin, bawo ni isoro re tipo to ni sise sise ise oojo re, ni lile ati kuro ni ile nitori oro ilera ara?

(a) ra ra ra ra (b) isoro kekere(c) o dara die (d) ko dara (e) ko le se ise ojojumo

4. Bawo ni irora ti ara ti o ni ti po to larin ose merin na.

(a) Ko si (b) o kere jojo (c) o kere ko jara lo (d) o nira o (e) ni ra pupopupo

5. Ni arin ose merin sehin, agbara ti o ni ti po to?

(a) Opoo (b) opo ganan (c) opo die (d) kekere (c) ko si gbara

6. Larin ose merin ti o gbehin, bawo ni ailera ti ara ati awon isoro tie ni ti din ku awon eto a jose pelu awon ebi at ore?

(a) ko si rara (b) o kere ko jara lo (c) o nira (d) o nira pupo jo jo

7. Ni arin ose merin sehin bawo ni ati da e lamu to pelu awon isoro tie ni (bi ki ara ma bale ki okan ko re eniyan abi ibinu)?

(a) ko si rare (b) die (c) ni iwon tu won si (d) o poo gan (e) o lee ke nkan

8. Ninu ose merin ti o koja, bawo ni oro ara eni abi isoro okan ti di e lowo to lati se ise ti o sa ba ma nse (iba se ile iwe abi awon ise miran)?

(a) ko si rara (b) o kere gan (c) bakan sa (e) pupo pupo (d) ko le ise ojojumo

AWON IWON ENIYAN PUPO ONIKAN META TI OSLO

Jowo fi ami si bi o ti ye

1. Ba wo ni o ti rorun fun e to lati ri iranlowo lodo aladugbo, bi o ba tile ni lo re?

(a) o rorun gan (b) O rorun (c) o sese (d) o le o (e) o le pupo

2. Eniyan melo lo sun mo, o ti o le gbekele, bi o ba ni isoro ti o ga?

(a) ko si enikan (b) eni kan si meji (c) eni meta si merin (d) nwon ju marun lo

3. Ba wo ni awon eniyan se fi oju si awon nkan ti o nse to?

(a) lopolopo (b) Die (c) ko daju (d) awon die (e) kosi rara.

Appendix VIII

PERMISSION TO CONDUCT RESEARCH

OSHODI-ISOLO LOCAL GOVERNMENT

TEL: 01-7302461
01-7302462
01-7302463

Please direct further communication to the Chairman, quoting.

OYETAYO STREET,
BOLADE, OSHODI,
LAGOS STATE,
NIGERIA.

Our Ref: No: OILG/PHC/016/002

Your Ref No:_____

Date: 18th February, 2016

Mrs. Enisan Catherine Ngozi,
Centre for Child and Adolescent Mental Health,
University of Ibadan,
Ibadan.

PERMISSION TO COLLECT DATA FOR RESEARCH PROJECT ON DEVELOPMENTAL DELAY AMONG UNDER-FIVE CHILDREN IN COMMUNITIES IN OSHODI/ISOLO

I hereby convey to you approval to collect data on your research proposal titled **"Family Characteristics and Psychosocial Correlates of Development Delay among under five children in Two Communities in Lagos."**

Kindly provide this office with findings from your survey.

MEDICAL OFFICER OF HEALTH
OSHODI / ISOLO L. G. A

DR. SOTUNDE OLUDOLAPO
Medical Officer of Health

SIGN.....
DATE.....

Appendix IX

Informed Consent Form

My name is Enisan Catherine, I am a post graduate student of the Centre for Child and Adolescent Mental Health, University of Ibadan. I am carrying out a study to determine the prevalence of Developmental delays among children less than 5 years old; I will need to ask you some questions, please note that the confidentiality of your answers will be maintained.

You will be given a number and your name will not be written on the questionnaire in order not to link you with any information you will be giving. Your information and those of other people selected will be used to make recommendation(s) to policy makers and health care workers to find solution to child developmental problems. Therefore, your honest answer to questions will go a long way to better identify and intervene early on children with developmental problems.

Note that you have the right not to participate, to withdraw at any given time if you choose to, and the right not to respond to some questions. I will greatly appreciate your help in responding to the survey and taking part in the study.

Consent: Now that the study has been well explained to me and I fully understand the content of the procedure, I will be willing to take part in the study.

_____ _____

Name & Signature of the Participant Interview Date