

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Hearing loss is one of the most chronic health conditions that has important implications on the individual's quality of life. However, hearing loss is substantially underestimated and undertreated (Ologe, *et al.*, 2006). Hearing loss is a chronic and often lifelong disability that can cause profound damage to the development of speech, language, and cognitive skills in children depending on the severity and frequencies affected, especially if it commenced in the pre-lingual period. (Cook *et al.*, 2006). That damage in turn, affects the child's progress in school and, later his or her ability to obtain and keep an employment (Cook *et al.*, 2006). Normal hearing is the main vehicle of acquisition of language in addition to speech and cognitive skills in children; therefore hearing loss poses a major difficulty during childhood (Collin *et al.*, 1997).

Students with hearing loss are the largest single population of children requiring special services in schools and majority of these children are being mainstreamed into regular classrooms (Better Hearing Institute, 1999). Evidence indicates that the high incidence and prevalence of hearing loss elicits concern all over the world (Okewunmi and Adejumo, 2011). Roeser and Downs (1998) reveal that congenital profound hearing loss occurs in 1 out of 1000 births worldwide. Nearly 10% of the world's population lives in sub-Saharan Africa, a region comprised of many countries with the least developed nation status (Mcpherson and Swart, 1997). This region has a predominantly young population and many children in the region are at risk of pathologies associated with hearing loss (Mcpherson and Swart, 1997). In 2001, the WHO estimated that 250

million people worldwide had hearing impairment of whom two thirds were in developing countries (WHO, 2002). Olubodun, (2003) estimated that about 2% (2.8 million) of the Nigerian population are hearing impaired.

Hearing loss has a significant impact on both the individual and the society. In children, the problem is compounded since normal hearing provides the main source of language acquisition, speech and cognitive skills (Ossama, 2010). The quality of life of an individual refers to aspects of an individual's well-being encompassing the physical, psychological, and social as well as aspects of the environment and standard of living (Harding, 2001). The period of adolescence is generally regarded as an important time of growth and change in an individual's life. It is a stage of life with rapid physical, emotional and mental developmental changes, which is occasionally complicated by the secondary school setting, increased responsibilities, and the desire to become an adult, yet little is known about how these changes influence the quality of life of young people who are deaf or hard-of-hearing (Skalicky *et al.*, 2010; Shlesinger, 2000). Hearing loss affects adolescent development in school settings, which are made more complicated in today's auditory versus visual world (Poe, 2006). Hearing impaired students face considerable challenges in developing interpersonal communication skills and the presence of this auditory disability means that spoken language is largely inaccessible for them (Akamatsu and Musselman, 1999). However, this does not mean that hearing impaired adolescents are unintelligent; it only means that their deafness impacts their lives in ways hearing people probably do not even realize (Poe, 2006).

1.2 Justification for the Study

The Quality of Life concept is important in children and youth with hearing loss because of the importance of communication and social participation in everyday life (Skalicky *et al.*, 2010). For the average hearing child, the period of adolescence may be stressful as they struggle to develop their own identity and independence, and at the same time depending on support from family and friends (English, 2002). This period is a difficult one for the hearing adolescent, let alone with someone with hearing impairment. Impaired communication with both family members and peers may lead hearing impaired adolescents to struggle with certain psychological issues, such as developing self-esteem, and these struggles may lead to social and behavior problems (English, 2002). “School is challenging, but if students cannot hear and everyone around them can, their self-esteem, and motivation, will be affected” (Poe, 2006). For all ages and for both sexes, hearing loss causes difficulties with interpersonal communication and leads to significant individual social problems, especially isolation and stigmatization. All these difficulties are much magnified in developing countries, where there are generally limited services, few trained staff members that may not be able to satisfactorily meet the needs of this set of the population and thereby leading to the affectation of their quality of life negatively (Cook *et al.*, 2006).

Focusing on quality of life is important to everyone, but much more for people who have to shape their lives under challenging conditions (Manfred, 2010). People with disabilities often experience lack of access to health services and medical care and are considered to be at increased risk for secondary conditions, such as musculoskeletal or mental health problems consequent to the primary disabling condition (Edwards *et al.*, 2003). As members of a

medically underserved minority group, individuals with disabilities might be expected to experience lower quality of life based on lack of policies that might take into cognisance their situation (Edwards, *et al.*, 2003). In the case of the Deaf and Hard of Hearing in particular, not being able to hear what is going on around them and participate successfully in the community crowned with the stigmatization and marginalization in the community may lead to depression or aggressive behaviours. This can ultimately affect their moods, their perception of situation and therefore their quality of life.

Information relating to the quality of life of the hearing-impaired in Nigeria which is currently sparse could be used for population needs assessment, program design and evaluation and educational placement. This study therefore examined the QoL of hearing-impaired students in Ibadan Metropolis, Nigeria.

1.3 Study objectives

The broad objective is to assess the quality of life of hearing-impaired students in Ibadan, Nigeria

The specific objectives are to:

1. To assess the domains of quality of life of hearing-impaired students in Ibadan.
2. To compare the quality of life of hearing-impaired students attending different types of school for the deaf
3. To determine the influence of sex, age, type of communication used at home, parents hearing status and social class on the quality of life of hearing impaired students

1.4 Research Questions

1. What is the quality of life of hearing-impaired students
2. Is there a significant difference in the quality of life of hearing-impaired students attending different types of school for the deaf?
3. Does sex, age, type of communication used at home, parents hearing status and social class impact on the quality of life of hearing-impaired students?

1.5 Scope of the Study

The study obtained information on the quality of life of hearing impaired students in senior secondary school attending different types schools for the deaf in Ibadan metropolis, Nigeria.

CHAPTER TWO

LITERATURE REVIEW

2.1 Hearing Loss and Deafness

Hearing is a complex sense involving both the ear's ability to detect sounds and the brain's ability to interpret those sounds, including the sounds of speech (National Institute of Health, 2012). Hearing loss is said to occur when a person cannot hear properly (Normal hearing is hearing thresholds of 25dB or better in both ears). Hearing loss may be mild, moderate, severe or profound and it can affect one ear or both ears. It leads to difficulty in hearing conversational speech or loud sounds (WHO, 2013). There is some inconsistency in the definition of deaf in that hearing level is defined differently by different organisations; while some consider hearing level in the better ear, others use average hearing level of the two ears for classification. Consequently, unlike blindness, there is no 'legal limit' for someone to be considered deaf (Holt, 1994) but the term 'deafness' generally refers to partial or total hearing loss, and generally also assumes the inability to hear and understand speech (Heather, 2007).

Hearing impaired is used to describe people whose hearing level is shifted 25 dB or more, averaged over the 500, 1000 and 2000 Hz frequencies (the region most critical in speech perception) (Schnupp *et al.*, 2012). It is used to describe people with any degree of hearing loss (Heather, 2007). Hearing impaired people are people with little or no ability to hear sounds through one ear (unilateral impairment) or both ears (bilateral impairment). They can be totally deaf or hard-of-hearing (Oladejo and Oladejo, 2011). Hard of hearing is used to describe people with hearing loss ranging from mild to severe. It also used to describe a person who experiences

hearing loss but is still able to hear and understand speech. These people usually communicate through spoken language and can benefit from hearing aids, captioning and assistive listening devices. People with more significant hearing losses may benefit from cochlear implants (WHO, 2013). Deaf people are people who mostly have profound hearing loss, which implies very little or no hearing and they often use sign language for communication (WHO, 2013).

Hearing levels is a measured value of an individual's threshold of hearing, expressed in decibels, relative to a specified audiometric standard. Clinicians measure sound intensity in dB HL (decibels Hearing Level), relative to the quietest sounds that a young healthy individual ought to be able to hear (Schnupp, *et al.*, 2012). In a clinical audiogram test, pure tones between ca 250 and 8000 Hz are presented at varying levels, to determine a patient's pure tone detection thresholds (the quietest audible sounds) in the left and right ear. Thresholds between -10 and +20 dB HL are considered in the normal range, while thresholds above 20 dB HL and 25 dB HL are considered diagnostic for varying degrees of hearing loss in children and adults respectively (Schnupp, *et al.*, 2012).

More than one term is used for someone who has difficulty hearing (Heather, 2007) because there are varying degrees of hearing loss. Some of these terms include: deaf, deafened, hearing impaired, hearing disabled and hard of hearing. These terms can be used to refer to different conditions in different contexts and in different cultures. Moreover, the varying degrees of severity of hearing impairment are defined differently by different organizations (Shield, 2006). In the USA and Canada, deaf is defined differently from hard of hearing; deaf is used for people who have total hearing loss and have to depend on lip reading and hearing aid where as hard of hearing is used for people who may not use an hearing aid (Shield, 2006). In the UK, deaf is

often used to include both totally deaf and hard of hearing people. In general, 'Hearing impaired' is the common term used to describe inclusively deaf and hard of hearing people in the UK. In North America, 'impaired' in hearing impaired seems to be derogatory, therefore people are categorized as either 'deaf' or 'hard of hearing' (Shield, 2006). The degree of impairment can be described as mildly impaired, moderately impaired and severely/profoundly impaired. Deafness is the final level of impairment while every other one is described as impairment or hearing loss (Olubi, 2011). Organisations concerned specifically with health or hearing use formal definitions based upon hearing levels (Shield, 2006).

The World Health Organisation (WHO) defines disabling hearing impairment in adults as a permanent unaided hearing threshold level for the better ear of 41 dB or greater (WHO, 2001). In children under 15 years of age, disabling hearing impairment is defined as permanent unaided hearing threshold level for the better ear of 31 dB or greater. The WHO classifies hearing impairment into 5 grades: mild, moderate, moderately severe, severe and profound hearing impairment.

2.2 Classification of Hearing Loss

1. Normal hearing/No impairment: This is when an individual has no or very slight hearing problems. The individual is able to hear whispers. Hearing level in the better ear is less than 25dB.
2. Slight impairment: The individual is able to hear and repeat words spoken in normal voice at 1 metre. Hearing level in the better ear is 26-40dB. This individual may need counseling and Hearing aids.

3. Moderate impairment: The individual is able to hear and repeat words using raised voice at 1 metre. Hearing level in the better ear is 41-60 dB. Hearing aids usually recommended for this individual.
4. Severe impairment: The individual is able to hear some words when shouted into better ear. Hearing level in the better ear is 61-80 dB. For this individual, Hearing aids is needed but If not available, lip-reading and signing should be taught.
5. Profound impairment including deafness: The individual is unable to hear and understand even a shouted voice. Hearing level in the better ear is >81dB. Hearing aids may help understanding words but additional rehabilitation is also needed. Lip-reading and sometimes signing are essential. (WHO, 2013)

2.3 Classification of hearing loss according to type of hearing loss

Conductive hearing loss – This occurs when hearing loss is due to problems with the ear canal, ear drum, or middle ear and other associated little bones (the malleus, incus, and stapes) (Hearing Loss Association of America, 2014). Conductive hearing loss occurs when the transmission of sound to the inner ear is impaired, perhaps due to impacted ear wax (cerum), an ear infection (otitis media with effusion (OME)), or calcification of the middle ear ossicles (otosclerosis). Conductive hearing loss leads to a loss of sensitivity across the entire range of frequencies, most commonly in one ear only. A ‘bone conduction test’, where sound is delivered as vibration to the skull rather than as airborne sound to the ear canal, can be used to confirm a suspected conductive hearing loss (Schnupp, *et al.*, 2012).

Sensorineural Hearing Loss (SNHL) occurs when hearing loss is due to problems of the inner ear; this is also known as nerve-related hearing loss (Hearing Loss Association of America, 2014). The most common cause of sensory neural hearing loss is damage to sensory hair cells in the cochlea. The outer hair cells in particular are very fragile, and can be damaged by exposure to excessively loud sounds, or they may simply "wear out" in old age (presbycusis). Other causes of SNHL include but not limited to use of certain drugs such as high doses of aminoglycoside, streptomycin, meningitis, and viral labyrinthitis. Central hearing loss (due to damage to the central nervous system) is very rare. Noise damage or age related hearing loss tends to produce characteristic deficits. Unlike conductive hearing loss, which can often be cured, sensory-neural hearing loss is in most cases irreparable, and treatment will aim to make the best use of those auditory structures that remain intact, perhaps by boosting sensitivity through a hearing aid, or in severe cases, by trying to bypass dead sensory hair cells with cochlear or brainstem implants (Schnupp, *et al.*, 2012).

Mixed hearing loss - refers to a combination of conductive and sensorineural hearing loss. This means that there may be damage in the outer or middle ear and in the inner ear (cochlea) or auditory nerve (Hearing Loss Association of America, 2014)

2.4 Classification of hearing loss according to age at onset of hearing loss

Prelingual hearing loss: This is a type of deafness that begins before the language of the environment is acquired. People generally learn the language well before age five. This usually includes people who are either born deaf (congenital deafness) or became deaf after a disease or accident before they develop the language of their environment. A person who is prelingually

deaf learns language through an artificial means i.e. reading and because print does not convey much language information that sound conveys, they combine imperfectly heard sounds with print and lip movement to assemble knowledge of a language and the result is diminished reading and writing skills (Malcom, 2011). All congenital hearing loss is prelingual but not all prelingual deafness are congenital (Smith *et al.*, 2014)

Post lingual hearing loss: This is a type of deafness that occurs after speech as been acquired. Persons with this kind of deafness usually have oral communication problems. Depending on the age at onset of the deafness, their reading and writing skills are similar to hearing persons but with a bit of delay in new idioms of the language. They find hearing aids very beneficial (Malcom, 2011).

2.5 Causes of Hearing Loss

Holt (1994) found that the cause of 58.5% of cases of deafness in children was reported to be unknown and only 0.6% cases of deafness are caused by trauma. Of cases in which the cause of deafness is known, causes can be divided into: Congenital causes and Acquired causes

Congenital causes are conditions that may cause hearing loss to be present at or acquired soon after birth. Hearing loss can be caused by hereditary and non-hereditary genetic factors or by certain complications during pregnancy and childbirth, this account for 8.7% of cases of deafness (Holt, 1994) which may include: Maternal rubella (which was once a leading cause of deafness but now only contributes to 2.1% of cases), syphilis or certain other infections during pregnancy; Low birth weight; Birth asphyxia (a lack of oxygen at the time of birth); Inappropriate use of

ototoxic drugs (such as aminoglycosides, cytotoxic drugs, antimalarial drugs and diuretics) during pregnancy and Severe jaundice in the neonatal period (WHO, 2013).

Acquired causes are conditions that may lead to hearing loss at any age. Some of such conditions include: Infectious diseases such as: meningitis accounting for 8.1% of cases (Holt 1994), measles and mumps accounting for 4.0% of incidences of deafness can lead to hearing loss, mostly in childhood, but also in life; Chronic ear infection, which commonly presents as discharging ears; collection of fluid in the ear (Otitis media) account for 3.7% of cases (Holt, 1994); use of ototoxic drugs at any age can lead to damage in the inner ear; Head injury or injury to the ears (WHO, 2013); Excessive noise, including working with noisy machinery, and exposure to loud music or other loud noises, such as gunfire or explosions, can harm a person's hearing; Age-related hearing loss (presbycusis) is caused by degeneration of sensory cells; Wax or foreign bodies blocking the ear canal can cause hearing loss at any age, this hearing loss is usually mild and can be readily corrected (WHO, 2013)

2.6 Prevalence of Hearing Loss around the World

About 5.3% of the world's population – 360 million people have disabling hearing loss (328 million adults (91%) and 32 million (9%) children); 183 million are males, while 145 million are female (WHO, 2012) (Table 2.1). The majority of these people live in low and middle income countries (WHO, 2013). About seven per 10,000 people worldwide are severely or profoundly deaf with onset of deafness before language development (WHO, 2013). The prevalence of disabling hearing loss in children is greatest in South Asia (12.3%), Sub-Saharan Africa (6.8%) Asia Pacific (3.4%), (East Asia 3.6%) and approximately one-third of persons over 65 years are affected by disabling hearing loss (WHO, 2012) (Table 2.1). The prevalence of disabling

hearing loss in both adult and children in high income countries of the world is 11%, 9% for Latin America and Caribbean, 10% for Asia Pacific, 27% for Asia, 3% Middle East and North Africa, 9% sub-Saharan Africa and 9% for central and Eastern Europe and central Asia (WHO, 2012).

Each year in the United States, more than 12,000 babies are born with a hearing loss and often, the cause is unknown (CDC, 2010). Approximately 1,465,000 individuals aged 3 and above are deaf in both ears (ASHA, 2009). Research in the U.S has shown that about 25% of deaf students have other disabilities, including learning difficulties, developmental delay, visual impairment and autism (Fellinger *et al.*, 2012). Among the US population, about 20% of adults- 48 million report some form of hearing loss, about 30 school children per 1000 have a hearing loss (Hearing Loss Association of America, 2014). In Europe and North America, population-based studies have identified a consistent prevalence of approximately 0.1% of children having a hearing loss of more than 40dB through review of health or education records, or both (CDC, 2013).

Although several studies have been carried out on the prevalence of hearing impairment, it has been difficult to compare or collate the data from the separate studies to give definitive estimates because the various investigations have used different study populations, different age ranges and different definitions of impairment (Shield, 2006 and Sorri *et al.*, 2001). Majority of studies have focused on prevalence among older people and only a few detailed reports exist on the prevalence of hearing impairment of different grades among adults of all ages. However, Shield (2006) was able to extract data from some European studies as follows: In Finland, among people aged between 25 and 75 years old, 0.1% of this population has profound hearing loss, majority (11.8%) have mild hearing loss, 2.8% have moderate hearing loss and 0.3% have

hearing loss (Ulmomonen *et al.*, 1999). In Sweden, among a population aged between 20 and 80 years, none has profound and severe hearing loss, but 18.5% and 4.5% have mild and moderate HL respectively (Johansson and Arlinger, 2003). In the UK, the figure generally quoted for prevalence of hearing impairment is 1 in 7, or approximately 9 million people including about 700,000 who are severely or profoundly deaf and 123,000 deaf people aged 16 and above in the UK who rely heavily on lip reading and written communication (RNID, 2003). In Australia, Walsh *et al.*, (1999) found an overall prevalence of 16.6% among subjects aged 16 years and above.

In 2001, WHO estimated 250 million people worldwide with disabling hearing loss (enumerating people with moderate or worse hearing impairment in the better ear, that is a BEHL of 41 dB or greater), of whom two thirds live in developing countries (WHO, 2002). In general, there is lack of accurate population based data on the prevalence and causes of hearing impairment in developing countries (WHO, 2001). In many African nations, the general awareness of hearing impairment is low and lack of resources has caused a lack of screening programs. The continent has a predominantly young population and many are at risk of getting diseases causing hearing loss (South African Hearing Institute, 2011). Overall, it is estimated that in the countries below Sahara, more than 1.2 million children aged between 5 and 14 years suffer from moderate to severe hearing loss in both ears. General prevalence studies show higher rates of severe to profound hearing loss in this part of Africa than in other developing countries (South African Hearing Institute, 2011). In Australia, according to the Australian Bureau of Statistics (1993), the number of people with hearing impairment in Australia in 1993 was 999,800 (5.2% of the total population), with 35,900 (0.19%) having total hearing loss (Biaffra, 2001). In Kenya, Gambia and Tanzania about 2.5 to 3.5 children in 1000 suffer from severe to profound hearing loss

(Mcpherson and Swart 1997; Seely *et al.*, 1995). In South Africa, about 7.5% of the school children suffer from varying degrees of hearing loss. In Swaziland, 4.1 percent of the children aged between 5 and 15 years suffer from hearing loss. In Nigeria about 14% of the school children have some kind of hearing loss (South African Hearing Institute, 2011).

Table 2.1: Prevalence of hearing loss in children and adults around the world.

Selected region	DHL in children		DHL in adults			
	Both sexes		Male		Females	
	Million	Prevalence (%)	Million	Prevalence (%)	Million	Prevalence (%)
High income	0.8	0.5	19	4.9	18	4.4
Central/eastern Europe and Central Asia	1.1	1.6	14	9	16	8.8
Sub-Saharan Africa	6.8	1.9	17	7.4	13	5.5
Middle East and North Africa	1.2	0.9	6	4.1	4	2.9
South Asia	12.3	52	5.4	9.5	36	7
Asia pacific	3.4	2	19	8.7	15	6.8
Latin America and Caribbean	2.6	1.6	15	7.6	13	6
East Asia	3.6	1.3	41	7.4	30	5.6
World	31.9	1.7	183	7.5	145	5.9

(Adults here refer to people aged 15 and above)

MBD, WHO, 2012 DHL estimates where DHL adult threshold is ≥ 41 dB and >31 dB in children (WHO, 2012)

2.7 Communication by Hearing Impaired People

Hearing impaired people have numerous ways of communicating with each other and hearing people. Although, they use a variety of ways to communicate, the choice of communication method depends upon the abilities of the person who is deaf or hard of hearing and on the complexity and nature of the communication that is required. The following are the common methods used:

Sign language: Sign language is used by many people who are deaf or hard of hearing. It is a visually interactive language that uses a combination of hand motions, body gestures, and facial expressions that correspond to words and ideas. There are several different types of sign language, including American Sign Language (ASL), British Sign Language (BSL) and Signed English (ADA, 2003).

Lip reading: Some individuals with hearing disabilities are trained in speech reading (lip reading) and can understand spoken words fairly well with assistance from an oral interpreter. Oral interpreters are specially trained to articulate speech silently and clearly, sometimes rephrasing words or phrases to give higher visibility on the lips. Natural body language and gestures are also used. People skilled in sign language use understand other people's speech by watching the way their mouths, faces and bodies move when they are talking. Lip reading is a vital communication skill for people who are deaf or hard of hearing. It can help people of all ages with any degree of hearing loss to communicate better (ADA, 2003; RNID, 2003)

Writing: This involves the use of pen and paper to write down words that should be otherwise spoken. It can be used by all hearing impaired people who can read and write.

Cued speech interpreters: A cued speech interpreter functions in the same manner as an oral interpreter except that he or she also uses a hand code, or cue, to represent each speech sound

(ADA, 2003). It can help people of all ages with any degree of hearing loss to communicate better.

Computer Assisted Real-time Transcription (CART)

Many people who are deaf or hard of hearing are not trained in either sign language or speech reading. CART is a service in which an operator types what is said into a computer that displays the typed words on a screen (Hearing Loss Association of America, 2014).

Assistive device: Hearing Impaired people who live on their own rely on special devices such as smoke detector, telephones and door bells can be equipped with light signals, vibrating devices in homes to alert deaf people from dangers or the arrival of a visitor. Hearing Impaired people can also communicate by phone with the help of telecommunication device for the deaf (TTD): this machine which must be at both ends of communication to translate spoken words into written words; then the people on the phone can read their conversation rather than hearing it (Q&A for kids, 2002). This device can be used by people with all kinds of hearing loss ranging from mild to profound hearing impairment. (Deaf websites, 2005)

Voice Carry Over (VCO): This form of communication allows a person to speak while receiving responses in text (Q&A for kids, 2002). This device is usually best for hearing impaired people who can speak (Deaf websites, 2005).

2.8 Hearing loss in young people

Hearing loss affects different ages of people differently. It may be necessary to consider what issues young people with hearing loss face as they have unique issues with hearing loss than older people (Hearing Loss Association of America, 2014). In adolescents and young people, hearing loss affects them in many different ways including identity formation which could

include; personality development, self-esteem and self-concept because this is the stage when most individuals form their identity and values (Meij and Heijnders, 2004). Getting the right communication access in classrooms in a college or continuing educational setting is not always easy for people with hearing loss. In high school for instance, parents and teachers may manage to help them get what is needed either with an individualized education plan or on a more informal basis but in higher education, young people with hearing loss may have to advocate for themselves (Hearing Loss Association of America, 2014).

Another area worthy of note is the social life of this group of people - young people generally have a more active social life than older people but hearing loss may put a peg on the social life of young people with hearing loss because communication is at the “heart” of most social interaction (Hearing Loss Association of America, 2014). Similarly, although most young people look forward to dating and relationships, young people with hearing loss may have communication issues with hearing counterparts. This often places a peg on their ability to date hearing people no matter how strong the attraction they feel (Hearing Loss Association of America, 2014). Furthermore, during Sports and recreation, the deaf young persons may not hear their coach, teammates, or referees and may seriously consider wearing hearing aids or cochlear implant during sporting activities as they wonder whether technology malfunction when they play sports (Hearing Loss Association of America, 2014). Affordability of Hearing aid or other technology is another challenge often experienced by young adults who often make less income than older people who have been working longer especially when they do not have supportive parents (Hearing Loss Association of America, 2014). Stigma is another problem associated with hearing loss or worse still using hearing aids especially among young people. Some young people may resort to covering their hearing aids with their hair to minimize the stigma (Hearing

Loss Association of America, 2014). Employment is another area to consider, looking for a first job is hard enough without having a hearing loss, how much more when a potential employer discovers an employee is hearing impaired, questions as to the competence, team work ability and communication skills of the young person may be doubted (Hearing Loss Association of America, 2014).

2.9 Hearing Impaired Adolescents and Communication at Home

Communication is the means by which family members build relationships and feel close to each other and the ability to voice their own opinions and ideas allows family members to develop ties with each other (Shield, 2006). Access to family communication allows access to family life; thus a hearing impaired child born into a hearing family may miss majority of the communication, and this may have a significant impact on the child's life (Bodner-Johnson and Sass-Lehrer, 2003). Parents-adolescent relationship has a strong impact on the development of adolescents in many different domains and an open parent-adolescent communication has been shown to be a protective factor against adolescent risk-taking behaviors (Shield, 2006). A study found that adolescents who had discussed sex with their parents have a lower risk of engaging in risky sexual behaviours (Guilamo-Ramos, 2006).

Furthermore, parental monitoring is another factor that largely affects decision-making for adolescents. Research has shown that as the adolescent receives more parental monitoring, they are less likely to take risks and to be depressed (Yu *et al.*, 2006). Open communication is vital to parental monitoring; the parent and the adolescent must be able to communicate effectively for monitoring to be effective (Yu *et al.*, 2006). Be that as it may, deaf people do not generally have

these opportunities as many of them cannot have quality communication with their parents if the parents have not developed ways to communicate with them.

In hearing impaired adolescents, poor communication cannot be overruled especially with hearing parents, as the majority of such adolescents experience impaired communication at home (Ridgeway, 1993). Approximately 90% of hearing impaired children have hearing parents, and about 80% of these parents are unable to effectively communicate and engage in deep communication with their hearing impaired children (Ridgeway, 1993). Furthermore, if hearing impaired adolescents do not have the ability to go beyond receiving instructions and answering basic questions, they may not be able to share their experiences and emotions with their parents (Ridgeway, 1993). Even when the child has learnt sign language skills and the parents have not, no strong two way communication is established and this often leads to problems such as frustration in parents and lowered self-esteem in the child (Desselle and Pearlmutter, 1997).

Poor communication within the family means that family members may not get to know their child well; parents and siblings might not know what the deaf child is like, including the child's feelings, thoughts, interests and this limits the social skills development of the child (Johnson and Sass-Lehrer, 2003). No matter the communication method used by the family, the deaf adolescent is likely to feel "left out" of family conversation especially during family times such as watching the television, talking during meal times and this is usually not limited to one conversation but often leaves the deaf adolescent with a general feeling of being disconnected from the rest of the family (Heather, 2007). However, sometimes, rather than withdraw from the family, the deaf adolescent may actually be feeling pushed away from the family because they

cannot communicate and this is often difficult for hearing family members to understand mainly because they can hear the conversations going on around them and fail to realize the isolation the deaf child feels without their sense of hearing (Heather, 2007).

However, roughly 12% of deaf children are born to deaf parents, for these ones, a different situation generally occur (Ridgeway, 1993). Their natural language (sign language or visual communication) is the first one they develop and they begin to develop language right away, rather than experiencing a delay because their parents communicate with them from birth using sign language (Desselle and Pearlmutter, 1997). Thus, their situation is more similar to hearing children of hearing parents (Heather, 2007); they do not have any trouble communicating with their parents. These children have been shown to have better social and emotional adjustment than hearing impaired children born to hearing parents and they feel more accepted in their family as well (Mitchell and Quittner, 1996). In contrast, in families with more than one hearing impaired child, the hearing impaired people and their signed communication (regardless of the hearing ability of the parents) will feel more accepted and these families are more likely to resemble a normal, balanced situation as opposed to a family with one deaf child who receives a disproportionate amount of attention (Marschark, 2007). Relationships among deaf siblings encourage more normal and healthy cognitive and social development (Marschark, 2007).

2.10 Education of the Hearing Impaired Child

Arguments exist on which choice of school is supportive to a better cognitive development of a hearing impaired child. The integration of hearing impaired pupils in mainstream schools is often based on possible cognitive gains (Heather, 2007). Decision for integration of hearing impaired

children with hearing children should be assessed considering its social consequences for students (Nunes *et al.*, 2006). Parents must consider how the educational environment will affect their child not only academically, but also psychologically and socially when making a choice of school for their hearing impaired child (Heather, 2007). It is also important that they take into consideration how the school they choose will affect their communication with their child such that the most beneficial choice is made because, if deaf students are rejected or feel isolated in schools, their education may ultimately suffer (Nunes *et al.*, 2006). Basically there are two major strategies for educating students with hearing impairment: the inclusion and the exclusion.

The **Exclusion** strategy is a system, whereby students with special needs such as hearing impairment are educated or taught using special techniques and equipment by specialist personnel (Osakwe, 2010). In this model, students are placed in special schools and classrooms so as to cater for their specific educational needs, aspirations and challenges that will enable them learn at their own pace (Oladejo and Oladejo, 2011). Special Schools for the deaf are schools with the hearing-impaired only that generally provide a wide range of special services for hearing impaired children including but not limited to sign language teachers, counselors, psychologists, and audiologists. These schools often have sports facilities and other social organizations available for students but these schools are typically small, accommodating only about 150-200 students (Heather, 2007). Communication at these schools is likely to be through sign language, both formally in the classroom and informally among students. Profoundly deaf students may find this setting more beneficial to their education, since they are likely to depend more heavily upon visual communication than any other means (Heather, 2007). Furthermore, the provision of extracurricular activities often provide hearing impaired students more opportunities to take on leadership positions than in mainstream schools (Spencer *et al.*, 2000)

and these activities help students to build friendships, self-esteem, self-confidence and social competence. Students who have attended such schools report that one of the greatest benefits of attending a school for the deaf was the lifelong friendships they were able to make (Heather, 2007). Conversely, hearing impaired students who are resident at these schools have complained that they feel disconnected from the rest of the society as they are not able to come home from school every day like other kids and spend time with their family, they missed communicating with family and this could be difficult and frustrating. In addition, hearing impaired students who have been placed in a special school after been previously mainstreamed may feel a sense of failure for not “making it” in the public environment (Heather, 2007). Spencer *et al.*, 2000 found that there is a sense of accomplishment in students who completed a mainstream education, as demonstrated by the students’ remarks. Finally, Schools for the deaf, while often providing a rich environment for the hearing impaired child, cannot replace the position of the family in the adolescent’s life, especially in the area of social development (Marschark, 2007).

The Inclusion strategy is a system, whereby regular education classes are combined with special education services in a regular system. This system allows for strategized, continued and planned interactions between students (Oladejo and Oladejo, 2011). This is also called Mainstreaming or integration. Here, specialized services are provided within a regular classroom by sending the service worker to work with one or more students in the regular classroom setting. Mainstreaming is also when a child with hearing loss goes to a regular school instead of a special school for the deaf. A child can be mainstreamed in two ways:

- a. Total Mainstreaming: this is when a child goes to a regular school and has all classes with hearing children. Special services, like interpreters, note takers or speech therapy would be needed.
- b. Partial Mainstreaming: this is when a child has some classes with hearing children, and some in a special room with a teacher of the deaf. A child may go to a hearing school, but have all or most of his classes in a resource room: a room set aside for students with hearing loss or other disabilities. Those classes are taught by a trained teacher of the deaf and specialized services are provided outside a regular classroom

In the 70s, a Public Law, 94-192 called the 'Education for All Handicapped Children Act' was enacted in the US by the states' congress: this act recommended that all handicapped students be taught in the "Least Restrictive Environment" (LRE) possible. It was assumed that the LRE for hearing impaired students would be a public school environment. Although this law did not mandate the education of hearing impaired students in mainstream schools, the law was generally interpreted that hearing impaired students should be educated in such schools unless or until they failed out and were placed instead in a separate school (Spencer *et al.*, 2000). Following the passage of this act, there was a steady shift of hearing impaired students to mainstream schools with 70% of students now being mainstreamed (Spencer *et al.*, 2000). This law was passed in an attempt to create a more inclusive environment for deaf children, but this shift in educational approach has raised many questions as some professionals are now questioning whether the change has brought an inclusive environment or isolation for these children (Heather, 2007). The interpretation of this law was the basis for which some deaf students successfully completed public school (Heather, 2007).

Spencer *et.al*, 2000 reported that hearing impaired students often have trouble communicating with hearing peers and thus experience difficulty forming friendships with other students because, although an interpreter is generally provided in the classroom. This is usually not sufficient as most major social interaction begins outside the classroom. In addition, while interpreters may be provided for extracurricular activities, the adolescent may still have trouble building relationships with peers as the hearing peers reported that they are less likeable and less likely to be chosen as friend and often feel more isolated than their counterparts in special schools (Marschark, 2007).

There is also some evidence that separate special education throughout elementary school is beneficial for the social and academic achievement of deaf children during their secondary and post-secondary schools years (Geers, 1990). Some researches have shown that attending partial and total mainstream schools with mostly hearing students is beneficial as the deaf children have a chance to learn how to function in the hearing world because of the opportunity to interact with other deaf and hearing students (Kluwin, 1999; Luckner, 1999). Ideally, inclusion would teach deaf children to function well in both the hearing and the deaf communities but in their formative years, deaf children are likely to benefit psychologically most from being in residential schools where they are among other deaf peers and are able to fully communicate and share experiences (Jambor and Elliot, 2005).

2.11 The Quality of Life Concept

The World Health Organization (WHO) defines Quality of life (QoL) as individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in

relation to their goals, expectations, standards, and concerns (WHOQOL, 1995). Quality of life is more than mere counting of symptoms but rather an individual's satisfaction with functioning in daily life (Fellinger *et al.*, 2008). While the subjective focuses on the physical, social and emotional functioning of the individual, the objective indicator focuses on the living condition, employment or school functioning and social relationships (Fellinger, *et.al*, 2008) Quality of life also refers to an individual's perceived physical and mental well-being (Streufert, 2008). Many factors influence and contribute to a person's perception of their quality of life. Health-related quality of life (HRQOL) is concerned with those factors which influence a person's QoL that can be affected by illness and their treatment and disability (Streufert, 2008). For instance, a person's QoL may be adversely affected by increased dependence on others due to a disability or pain brought on by an illness (Streufert, 2008). In medicine, QoL has been equated with a variety of terms, including satisfaction with life and health, self-esteem, well-being, happiness, health, (Grantham University, 2013). Information on the social, economic and environmental conditions can be used to describe and quantify the quality of life of an individual (Jamieson, 2006).

2.12 Health Related Quality of Life

The Health-related quality of life (HRQoL) is an individual's satisfaction or happiness with domains of life as far as they affect or are affected by health. It can be distinguished from quality of life in that it concerns itself primarily with those factors that fall under the purview of health care providers and health care systems (Wilson and Cleary, 1995). Health-related quality of life can be considered as that part of a person's overall quality of life that is determined primarily by their health status which can be influenced by clinical interventions (Juniper, 2005). It is also the functional effects of an illness and its consequent therapy upon a patient as perceived by the patient (Juniper, 2005). Assessment of HRQoL is an attempt to determine how variables within

the dimension of health (e.g., a disease or its treatment and disability) relate to particular dimensions of life that have been determined to be important to people in general (generic HRQoL) or to people who have a specific disease (condition-specific HRQoL). Most conceptualizations of HRQoL emphasize the effects of disease and disability on physical, social, psychological /emotional and cognitive functioning. Often times, symptoms, health perceptions, and overall quality of life are included in the concept domain of HRQoL (Ware, 1995).

The current prevalence data in the vast majority of studies conducted on psychosocial development of hearing impaired people clearly show that the estimated frequency of social-emotional problems is far higher in deaf and hard of hearing children than in children who hear well (Hintermair, 2010). It should be noted however that, most of these data came from children and young people attending a special school for the deaf and hard of hearing (Hintermair, 2010). The results of studies which also include mainstreamed students (Van Gent *et al.*, 2007 and Mejstad *et al.*, 2008/2009) clearly show a lower prevalence among this group of deaf students

2.13 Physical Health of Hearing-Impaired People

Physical health can be defined as an essential part of overall health of an individual, which includes everything from physical fitness to overall wellbeing. Physical health is a state of physical well-being in which an individual is mechanically fit to perform their daily activities and duties without any problem (Cheshire East Council, 2014). Physical health is critical for overall well-being and is the most visible of the various dimensions of health, which also include social, intellectual, emotional, spiritual and environmental health. In general, hearing-impaired people who suffer from untreated hearing loss express less physical well-being than people with

normal hearing and hard-of-hearing people who use hearing aids (Touchett, 2001). The deaf health study (the current largest and most extensive study of the health of deaf people in the world) carried out in the UK, generally found poorer health, poorer diagnosis, poorer treatment and management of diseases among deaf people in the UK. The study found that deaf people generally had healthier lifestyles (in terms of smoking and alcohol consumption) than the rest of the population, they have a higher likelihood of been overweight and are two times more likely to have undiagnosed high blood pressure than the rest of the population (The deaf health charity Sign health, 2014). Even when they have been diagnosed, they are less likely than hearing people to be adequately treated for these conditions. Under-diagnosis and under-treatment of potentially serious conditions is more common in deaf people and all these may put deaf people at risk of preventable heart attacks and strokes, and diabetic complications such as kidney failure and blindness which could cause long-term ill-health, disability, and death (The deaf health charity Sign health, 2014). These problems were probably largely due to deaf people's poor access to services, poor communication and poor access to information (The deaf health charity Sign health, 2014). Werngren-Elgstrom, 2003 examined ill-health symptoms of 109 pre-lingually deaf individuals in Southern Sweden and revealed that majority had problems ranging from headache, back and chest pain, constipation anorexia, eye problem, dizziness, diarrhea, abdominal pain among others

2.14 Psychological/ Mental Health of hearing-impaired people

Mental health is described as a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community (WHO, 2013). Indicators of Mental health include: Emotional well-being such as perceived life satisfaction, happiness, cheerfulness,

peacefulness. Psychological well-being such as self-acceptance, personal growth including openness to new experiences, optimism, hopefulness, purpose in life, control of one's environment, spirituality, self-direction, and positive relationships and Social well-being: social acceptance, beliefs in the potential of people and society as a whole, personal self-worth and usefulness to society, sense of community (CDC, 2013). A good mental health helps to improve quality of life; when an individual is free of depression, anxiety, excessive stress and worry, addictions, and other psychological problems, life can be lived to the fullest (Rhodes, 2012). In studies of children with psychiatric disorders, lower quality of life has been repeatedly reported (Bastiaansen, 2004; Mattejat *et al.*, 2005) although such studies mainly concentrated on health problems that are disease associated and neglected the positive aspects of quality of life- for example, Lindstrom (1993) demonstrated that, in Nordic countries, children with disabilities (cystic fibrosis and meningomyelocele) reported that they lived in good material and socioeconomic conditions but regarded their psychological conditions as less favorable. It is empirical therefore to say that so far, quality of life measures have not been used in population-based samples of deaf and hearing impaired children using the child as the informant (Shield, 2006).

Hearing loss is challenging at any age, but it poses unique psychological issues for the young child. Having a hearing loss does not mean a child will develop psychological problems, just as a child from a family of divorce may not have emotional difficulties but increased incidences of behavioral and psychological problems have been found in children who are deaf or hard-of-hearing (Kaland and Salvatore, 2002). Behavioral problems such as hyperactivity or aggression can be the outward expression of internal difficulties such as depression, anxiety, and learning disorders in such children; all of these problems invariably lowers their psychological health

(Kaland and Salvatore, 2002). Various studies have reported the prevalence of psychological disorders among people with hearing loss, some of which have shown a high prevalence of emotional disorder. However, the methods used to reach these conclusions have often been flawed in terms of the psychiatric classification used (Shield, 2006). A study found that 27% of people attending a neurotology clinic with hearing loss suffered from significant psychological disturbance (McKenna, 2001). Clarke, (1995) in a study among 130 children and adolescents who are deaf and hard of hearing in Birmingham (UK) also found that Conduct and emotional disorders were common among deaf and hard of hearing children and adolescents; some of them suffered from obsessive-compulsive disorder (2.3%), schizophrenia (1.6%), depressive disorders (3.9%), bipolar disorders (2.3%), or eating disorders (2.3%). Complaints of difficulty in concentration are found among hearing impaired people, including younger people and it has been assumed that difficulties in concentration are due to fatigue, resulting from the effort of listening and lip reading, or from emotional distress (Shield, 2006).

Hindely *et al.*, 1994 also reported increased rates of psychosocial problems with regards to the mental health of hearing impaired people, with prevalence of psychiatric disorders ranging from 15 to 60%. This variation of 2–5 times higher rates than in hearing children is due to a number of conditions, including heterogeneity of samples, different informants, and varying assessment procedures as most studies of mental distress among deaf and hard of hearing children have used questionnaires administered either to parents and teachers (Freeman, 1975; Klovin, 1979) or to teachers alone (Shelsinger, 1972; Aplin, 1987) as their method of assessment. Those studies with control groups of hearing children have usually shown higher rates of mental distress among the deaf (Fellinger, 2008), but some studies that reported higher rates according to teachers were not

confirmed when the parents' questionnaires were considered: For example, Sinkkonen (1994) did not find elevated rates of psychosocial problems in a representative sample of hard of hearing and deaf Finnish pupils in his survey where he used teacher's information while Hintermair (2006) and Eldik (2004) (using a non-representative samples) found prevalence rates of 39–41% of socio-emotional problems in deaf children when strengths and difficulties questionnaire (SDQ) filled by the parent and child behavior checklist (CBCL) were used and this was approximately 2–3 times higher than in general population samples (Fellinger *et al.*, 2008).

Furthermore, a study of 40,000 US children with hearing loss showed that a striking 40% of the children had to cope with additional physical and psychological problems (Gallaudet Research Institute, 2002). Ten percent and below reached an IQ of 70 when compared to an estimated 2.3% in the normal hearing population (Huber and Kipman, 2011). Some reasons adduced for the high vulnerability of people with hearing loss to psychiatric conditions could be genetic conditions (Gross *et al.*, 2001) or the events that caused the hearing loss or deafness. For instance: consequences or complications of a preterm birth- brain pathologies, neurological disorders, physical handicaps, or a low IQ can occur in these individuals and these complications are found to be risk factors for emotional, behavioral, and social problems (Huber and Kipman, 2011). Additional factors associated with mental problems and disorders of these people are: the problems of communication (signing versus oral), choice of school to attend (special versus mainstream education), emotional disorders associated with social isolation, peer victimization, and the problems faced at home while the child is trying to make himself understood within the family (Fellinger *et al.*, 2009). Some other psychological issues associated with hearing loss are:

embarrassment, shame, guilt and anger, sadness or depression, anxiety and suspiciousness; self-criticism and low self-esteem and confidence (Touchette, 2001).

2.15 Social Relationship of Hearing-Impaired People.

Social integration refers to overall level of involvement with informal social relationships, such as having a spouse, and with formal social relationships, such as those with religious institutions and volunteer organizations (Umberson and Montez, 2010). Quality of relationships includes positive aspects of relationships, such as emotional support provided by significant others, and strained aspects of relationships, such as conflict and stress (Umberson and Montez, 2010).

Social interaction and support is one of the most important factors that help to predict the physical health and well-being of an individual, ranging from childhood through adulthood (HEBF, 2012). Although social interaction is complex, it is vital to human health, both mentally and physically (HEBF, 2012). Often times, people find it hard to open up their hearts and share their feelings and problems. However, in a social interaction where people can express their feelings and share their problems with other people, there is a beneficial outcome on human health. Good social support might also help people to cope with stress and major life changes; good social interaction has a positive influence on human beings' physical and mental health. It lowers occurrence of stress, depression, anxiety and also highly affects our endocrine-immune system (HEBF, 2012). Each of the aspects of social relationships affects health and touches on virtually all the aspects of life of an individual.

Considering that people with hearing loss cannot hear people around them, they often live their lives devoid of social discrimination and stigmatization and may likely experience difficulty interacting in different social settings as a result of their inability to interact in an “acceptable

manner” (Poe, 2006); so it might be important to consider how they interact in a hearing world. Hearing loss can have a profound effect on both the social and family life of an individual. This can occur whether the symptoms remain unnoticed or a recent diagnosis or even if it has been there for a long time (Royal Institute for Deaf People, 2009). The impact of hearing loss on social relationships may include: less interesting conversation, difficulty associating in noisy places and distinguishing sounds, change of personality, isolation, partaking in fewer activities, and intimacy issues with feelings of inadequacy, problems getting on at work and sexual issues (Royal Institute for Deaf People, 2009).

2.16 Quality of Life in People with Hearing Loss

Hearing Review in the US carried out a research in the late 2007 and found there are a number of quality of life issues faced by hearing impaired people. A profound hearing loss is a major disability which affects all aspects of life and has varying effects on different individuals (Kochkin, *et al.*, 2007). However, these effects may vary based on certain factors such as environment, educational level and socioeconomic status. Although the effects of hearing loss vary between individuals, most hearing-impaired people generally have issues with social interaction, language and communication, education, behavioral problems, mental health and safety (Kochkin *et al.*, 2007). Touchett 2001 also found that these people suffer some social, psychological and physical problems as a result of their hearing loss. Many studies have also revealed that adult with hearing loss have poorer mental health, physical and social functioning, and overall quality of life (Strawbridge *et al.*, 2000; Dalton *et al.*, 2003; Chisholm *et al.*, 2007). A pilot study by Borton, *et al.*, (2007) suggested that differences in quality of life between normal hearing children and those with hearing loss may be similar to those reported between

children with chronic illness (such as sickle cell and obesity) and healthy children as they both groups reported poorer health related quality of life (Palermo, *et al.*, 2002; Varni et al, 2003).

The first major study into the psychosocial effects of hearing impairment was carried out to examine the relationships between hearing loss and psychiatric disturbance, general health and wellbeing, social and family life, and employment among people of working age, and found that hearing loss impacted upon all these areas (Thomas and Herbst, 1980). Rutman (1989) also considered the overall impact of hearing loss on quality of life and stated that 'Acquired deafness is a social and psychological loss which affects all communication and interpersonal interactions and deprives the individual of the type of social relationships, occupational goals and overall quality of life to which they were accustomed which gave life meaning' (Shield, 2006). Mulrow *et al.*, (1990) also found that hearing loss had important adverse effects on quality of life with greater hearing loss being associated with greater dysfunction. Hallberg (1996) found that avoiding potentially demanding auditory situations such as parties, group meetings, or restaurant visits, a consequence of noise induced hearing loss has a resultant effect in terms of loneliness, isolation and decreased quality of life. Lalande *et al.*, (1988) found that noise induced hearing loss affected the quality of life of workers both at home and at work in a study carried out in Canada. Erlandsson and Holgers (2001) found that the more severe the hearing loss, the more negative the impact on daily activities: work, social relationships, family life, sexual life and leisure time of adults (>25 years) with tinnitus in Sweden. However in contrast to the above findings, Salomon *et al.*, (1988) in a study of elderly people in Denmark found no correlation between hearing disability and general satisfaction with life. Grimby and Ringdahl (2000) found little impact of hearing impairment on quality of life in a study among thirty five people aged

between 22 and 64 years with profound hearing loss in Sweden (although this may not be truly representative of the hearing impaired people in general).

Lastly, It is important to consider who is actually qualified to be an informant when it comes to evaluating the quality of life of deaf and hard of hearing students; various studies have used different respondents such as teachers of deaf pupils, parents and the deaf themselves with each of these studies coming up with different outcomes. Whether parents or teachers actually have sufficient knowledge to give an extensive and valid assessment of the QoL of hearing impaired children is an equivocal issue (Hintermair, 2010). Wake *et al.*, (2004) found poor health related quality of life in children with hearing loss based on parents' information. Thomas and Herbst (1980) in their study of hearing impaired people between ages 16 and 64 reported hearing loss was associated with important adverse effects on quality of life (greater psychiatric disturbance, health problems, social isolation, loneliness) when compared to a hearing group. This study generally found that greater severity of hearing loss was associated with greater dysfunction but the experiences of hearing impaired young adults and the effects of hearing loss on their lives has not been fully studied (Shield, 2006) especially in developing countries. This brings to fore, the need to examine how this disability affects the quality of life of young people in school settings in Nigeria.

CHAPTER THREE

METHODOLOGY

3.1 Study Design

The study adopted a descriptive cross sectional design that assessed the quality of life of hearing impaired students in Ibadan metropolis using the quantitative method of data collection.

3.2 Study Population

Hearing impaired students in senior classes 1 and 2 in the secondary schools for the deaf in Ibadan were the study participants.

Three groups of hearing impaired students were enrolled from all the four secondary schools for the deaf in Ibadan: One group attending a special school for the deaf (Christian Mission School CMC), another group attending a partial mainstream school (regular schools with deaf unit-Methodist Grammar School, Bodija) and the last group were those attending total mainstream schools (regular schools with hearing impaired children mainstreamed into regular classes with hearing children-Ibadan school for the deaf and IMG) settings in Ibadan.

3.3 Study Location

The study was carried out in all the four secondary schools for the deaf in Ibadan. Ibadan, the capital of Oyo state is located in the south-western Nigeria. It has a populace of about 3,800,000 according to 2006 population census (NPC, 2006). The principal inhabitants of the city are Yorubas.

Christian Mission Centre (CMC) is a special school for hearing impaired students only. The school is located at Onireke, Ibadan. It's a private school that was established by Andrew Foster.

The school has special facilities for hearing impaired students. The school has boarding facilities, about 80% of the school's population stay within the school premises and majority of the workers in the school environment can use sign language.

IMG Oke Ado is a government owned secondary school located at Oke Ado in Ibadan south west local government area. It's a total mainstream school for the deaf where hearing impaired students are put in the same class with hearing students but have interpreter services during lecture periods.

Ibadan School for the Deaf (IBSD), Ijokodo is another total mainstream school for the deaf located in Ijokodo area of Ibadan. It is also a government owned school. This school has majority of hearing students but also have interpreter services during lecture periods for her hearing impaired students who are in the same class setting with hearing students. Twenty eight (28) students were enrolled into the study from this school.

Methodist Grammar School (MGS) is another government owned school with special facilities for the hearing impaired. It is located in Bodija in Ibadan north local government area of Ibadan. This school has a special unit for her hearing impaired students i.e. the hearing impaired students are put in classes different from the hearing students where interpreter services are available to the students for all their lecture periods. It is referred to as a partial mainstream school for the deaf.

3.4 Inclusion criteria:

Eligibility for participating in the study was based on being:

1. A hearing impaired person whose hearing is sufficiently non-functional for ordinary life to compel them to depend on sign language as their primary language
2. A hearing impaired person with no other co-morbidities including self-identified intellectual impairment or learning disabilities
3. A hearing impaired person attending CMC, MGS, IBSD and IMG schools for the deaf in Ibadan.
4. A hearing impaired person who is able to read, write and understand English language

3.5 Exclusion criteria:

1. Individuals who did not meet any of the inclusion criteria listed above or did not give assent were not eligible to participate in the study.
2. Individuals who had other forms of disability in addition to hearing impairment

3.6 Sampling Technique

Students in SS1 and SS2 with hearing impairment in all the participating schools who met the inclusion criteria were enrolled.

3.7 Data Collection Instruments

Data were collected using an interviewer assisted questionnaire. This consists of questions on socio-demographic characteristics, information on hearing impairment and quality of life of the hearing impaired students. The Brief version of the WHO Quality of Life Questionnaire (WHO-

BREF) was used to measure the QoL of the students (appendix V). The study questionnaire was pretested among 30 hearing-impaired undergraduate students of the College of Education, Oyo by a trained certified interpreter. After the pretest and analysis of the data obtained from it, some adjustment was made to the information on deafness section including- rephrasing and removing irrelevant questions to obtain the questionnaire that was eventually used for data collection. The questionnaire had forty eight (48) questions which were grouped into three sections

Section A: Socio-demographic Information

Section B: Information on respondent's hearing impairment

Section C: Quality of life assessment

3.8 Socio-economic Classification

Socio-economic classification was based on the model designed by Oyedeji, (1987). Details of the education and occupation of the parents or guardian was collected and awarded values. Mean score of the values for both parents were computed and this mean score denoted the socio-class each participant was placed (appendix IV).

SOCIAL CLASS	MEAN SCORE
I	0.5-1.25
II	1.5-2.25
III	2.5-3.25
IV	3.5-4.25
V	4.5-4.75

Classes I and II are the upper classes, class III is the middle class and classes IV and V are the lower classes.

3.9 Data Collection Procedure

Before the administration of the questionnaire, each of the schools' authority was approached and permission was obtained from them. Informed consent and verbal assent was obtained from the eligible students after the objectives have been explained to them in sign language. The questionnaire was interviewer assisted. One certified sign language interpreter was recruited as research assistant and trained on data gathering using the questionnaire. Consenting hearing impaired students were requested to fill the questionnaires with the interpreter assisting wherever they needed clarifications. Interviews were conducted during free periods and after school hours in a place that ensured minimal distraction. Effort was made to ensure proper filling of questionnaire, by carefully checking each questionnaire at the point of collection from students to minimize errors and non-response rate.

3.10 Data Management and Statistical Analysis

Scoring and Analysis of WHO-BREF: The WHOQOL-BREF contains a total of 26 questions which provide a broad and comprehensive assessment; one item from each of the 24 facets contained in the WHOQOL-100 has been included (WHOQOL-BREF, 1996). The tool has 4 domains and two items asking respondents to rate their quality of life and satisfaction with their general health. Each question was scored on a 5-point Likert scale and questions 3, 4 and 26 (negatively framed questions) were recoded thus transforming them to positively framed questions. The mean score of item within each domain was used to calculate the domain score. Mean scores (domain score) were then multiplied by 4 in order to make domain score comparable to WHOQOL-100. Total obtainable score ranged from 26 to 130 and higher scores

correspond with higher quality of life in all the domains examined (WHOBREF, 1996). Independent t-test and ANOVA was used to determine if scores varied across genders, type of school attended, age groups, age at onset of hearing loss.

IBM SPSS statistics version 20 was used for the data analysis. Exploratory analysis was first conducted to check data entry errors and the normality of the distribution of the quantitative variables. The main outcome variables were self-reported physical health, psychological health, social relationship and environmental quality of life scores. Descriptive statistics such as percentage, mean and standard deviation were used for summarising socio demographic variables- age, gender, age at onset of hearing impairment; communication method used at home and type of school attended and QOL scores. Inferential statistics- Pearson's correlation test was used to test statistical significance of the relationship between the dependent and independent variables such as age, age at onset of hearing impairment, type of school and QOL scores. Statistical level of significance was set at 5%

3.11 Ethical Consideration

This study followed the ethical principles guiding the use of human respondents in research.

Approval for the study was obtained from the University of Ibadan/ University College Hospital (UI/UCH) Health Research Ethics Committee.

Beneficence: The vulnerability of the students with hearing impairment was acknowledged and the potential benefit to the local community of research was emphasized. They were informed that they will not necessarily benefit directly from the project but that the data will be used to try to identify areas that might need interventions.

Informed Consent and Confidentiality: The nature, purpose and process of the study were explained to the respondents through a sign language interpreter after which written informed consent were obtained. Respondents were assured of confidentiality, privacy and anonymity of information provided as no identifiers was put on the questionnaire. Data collected was kept in a secure place to ensure confidentiality.

Voluntariness: Participation in the study was absolutely voluntary as no one was coerced to participate. Respondents were reassured that refusing to participate in or withdrawing from the study would not disadvantage them in any way.

3.12 Limitations of the Study

Hearing impairment was based on self-report, teachers' report and interviewer's physical judgment and not on any diagnostic assessment of the respondents' hearing as no PTA to determine degree of hearing loss was taken. QoL could be affected by degree of hearing loss. Selection bias may be another limitation since only senior students who could read, write and understand English language were recruited into the study. The method of socio-economic classification used in this study may cause a bias in the allocation of social class: it is possible that some of the respondents may not be very certain of the educational level of their parents and the cadre their parents belong in the public and civil service.

CHAPTER FOUR

RESULT

Information was obtained through the use of a 48-item interviewer-assisted questionnaire given to 110 hearing-impaired students in the study locations. Eight questionnaires were wrongly filled and were thus exempted from the analysis. All results shown are for 102 respondents.

4.1 Distribution by Type of School

Hearing-impaired respondents were from the four secondary schools for the deaf in Ibadan: two total mainstream schools, one special school and one partial mainstream school. The distribution of students from each school is given in Table 4.1

4.2 Distribution by demographic characteristics

The mean age of hearing-impaired respondents was 17.8 ± 2.8 years with a age range of 12 to 30 years. Majority 61.8% (63) of the students were within ages 16-19 years and 19.6% (20) being between 20-23 years. Only four participants were above 23 years (Table 4.2). The proportion of females in the study population was 55.9% (57) while 44.1% (45) were males. Majority 60.8% (62) of the respondents were Christians 37.3% (38) were Muslims and 2% (2) were traditional worshippers. Most of the respondents were Yoruba 59.8% (61), 28.4% (29) were Ibo, 8.8% (9) Hausa and 2.9% (3) were from the other Nigerian tribes (Table 4.2). 62.7% (64) of respondents were from monogamous homes and 37.3% (38) came from polygamous homes. Most of the respondents' parents had SSCE as their highest level of education: father 47.1% (48) and 53.9% (55) mothers. Many 42% (43) of the respondents' father were from the junior grade public servant category although about 34% (35) also came from the intermediate public servant

category. Majority 69% (20) of respondents from the intermediate group were attending special school. In contrast, 52.9% (54) of the respondents' mothers were petty traders and its equivalent and about 11.8% (12) were from the intermediate public servant category and only 2% (2) of respondents' mothers were unemployed.

4.3 Social Class

Social class was computed from education and occupation of respondents using Oyedeji's socio-economic classification (Table 4.3).

Table 4.1: Distribution of hearing-impaired respondents by type of school for the deaf attended

	Name of school	Type of school	Number of respondents	Percentage (%)
1	Ibadan school for the deaf	Total mainstream	26	25.5
2	IMG Oke Ado	Total mainstream	16	15.7
3	Methodist Grammar School	Partial mainstream	31	30.4
4	Christian Mission Centre	Special	29	28.1
		Total	102	100

Total mainstream: (n=42) Partial mainstream (n=31) Special (n=29)

Table 4.2: Distribution of subjects by socio-demographic characteristics

Variables	Total mainstream school N=42		Partial mainstream school N=31		Special School N=29		Total N=102	
	Freq	%	Freq	%	Freq	%	Freq	%
<i>Age group(years)</i>								
12-15	12	28.6	1	3.2	2	6.9	15	14.7
16-19	23	54.8	23	74.2	17	58.6	63	61.8
20-23	6	14.3	6	19.4	8	27.6	20	19.6
24-27	1	2.4	1	3.2	0	0	2	
28-31	0	0	0	0	2	6.9	2	1
<i>Sex</i>								
Male	23	54.8	10	32.3	12	41.4	45	44.1
Female	19	45.2	21	67.7	17	58.6	57	55.9
<i>Ethnicity</i>								
Yoruba	23	54.8	24	77.4	14	48.3	61	59.8
Ibo	11	26.2	5	16.1	13	44.8	29	28.4
Hausa	7	16.7	2	6.5	0	0	9	8.8
Others	1	2.4	0	0	2	6.9	3	2.9

Table 4.3: Social class of respondents according to type of school attended

Social class	Special n (%)	Partial mainstream n(%)	Total mainstream n(%)	Total n(%)
Upper	21 (72.4)	6 (19.4)	2 (4)	29(28.4%)
Middle	6 (20.7)	18 (58.1)	20 (47.6)	44(43.1%)
Lower	2 (6.9)	7 (22.5)	20 (47.6)	29(28.4%)
Total	29	31	42	102 (100%)

4.4 Health-Related Quality of Life Assessment

Results show two items examined separately: respondents' self-report of their QoL and respondent's satisfaction with their health (table 4.5) and four other domains of the WHOQoL. Sixty two percent (63) of the respondents perceived their QoL as poor, 30% (31) reported their QoL as good while 7.8% (8) were indifferent and reported their QoL as neither good nor bad. Fifty six percent (57) of respondents were dissatisfied with their health, one third 32.3% (33) reported satisfaction with their health and 11.8% (12) were neither satisfied nor dissatisfied with their health. In the physical domain where obtainable score ranged between 7 and 35, respondents had mean score of 12.7 ± 2.5 (table 4.4). In the psychological health domain with obtainable scores ranging between 6 and 30, respondents had mean score of 11.9 ± 2.6 (table 4.4). However in the social domain with scores ranging between 3 and 15, respondents had mean score of 11.9 ± 2.7 (table 4.4). In the environment domain with obtainable scores ranging between 8 and 30, respondents had mean score of 11.3 ± 2.3 (table 4.4).

Table 4.4: Subjects' HRQoL Scores in the two stand-alone questions and the domains examined

Rating	Satisfaction	Physical	Psychological	Social	Environment	Total	QOL
QoL	with health	Health	Health	Relationship		score	
2.7±1.2	2.7±1.3	12.7±2.5	11.9±2.6	11.9±2.7	11.3±2.3	77.1±11.9	

Table 4.5: HRQoL scores of males and females compared.

	Males	Females	p-value	t-value
	N=45	N=57		
Rating QoL	2.58±1.14	2.72±1.33	0.572	-0.57
Satisfaction	2.51±1.2	2.91±1.35	0.121	-1.56
with health				
Physical	12.97±2.81	12.45±2.11	0.29	1.07
Psychological	12.17±2.80	11.64±2.51	0.31	1.02
Social	12.38±2.59	11.64±2.68	0.17	1.39
Environment	11.55±2.40	11.17±2.23	0.41	0.84

In all domains, higher scores correspond with higher QoL. No significant differences between males and females at $p \leq 0.05$.

4.5 HRQoL scores and some independent variables

A one way ANOVA and independent t-test between subjects was conducted to compare effect of some independent variables such as gender, age of respondent, age at onset of hearing impairment, communication method used at home and parent's hearing status on each of the HRQoL scores:

Males had higher scores in all domains but did not significantly differ from females in any of the domains (table 4.5). Age of student was found to significantly affect only their physical health with students between ages 20-23 having the highest physical health score. Age at onset of hearing impairment was not found to significantly affect any of their physical health, psychological health, social relationship or environment quality of life (table 4.6). However, type of deaf school attended had a significant effect on respondents' social and environment domains at $p < 0.05$ [$f(2, 99) = 3.18, p = 0.046$ and $f(2, 99) = 6.86, p = 0.002$ respectively] (table 4.7)

In the social domain, Post hoc comparison using the Tukey HSD test indicated that the mean score for students attending special schools (Mean= 12.96, SD= 3.04) was significantly higher than those in total mainstream school (mean= 11.39, SD=2.51), but students in partial mainstream school (mean= 11.82, SD=2.28) did not significantly differ from those in special and total mainstream school (table 4.7). Similarly, in the environment domain, Post hoc comparison using the Tukey HSD test indicated that the mean score for students attending special schools (Mean= 12.60, SD= 2.34) was significantly higher than the total mainstream school (Mean= 10.76, SD=2.23) and also significantly higher than those in partial mainstream school (Mean=10.93, SD=1.95). No significant difference was seen between students attending partial and total mainstream schools (table 4.7). Communication method used at home was not found to significantly affect any of their physical health, psychological health, social relationship or

environment quality of life (table 4.6). In the same vein, parents' hearing status also did not significantly affect any of the QoL score (table 4.6).

Table 4.6: HRQoL Scores by Age, Age at onset of deafness, type of school attended, communication at home and parents' hearing status.

	physical Mean±SD	Sig	psychological Mean±SD	Sig	social Mean±SD	Sig	enviroment Mean±SD	sig
Age group								
12-15 n= 15	11.09±2.17		11.56±2.80		10.76±2.11		10.83±2.55	
16-19 n= 63	12.61±2.44		11.66±2.63		12.29±2.90		11.27±2.24	
20-23 n= 20	13.71±2.17		12.83±2.47		11.67±2.11		11.55±2.29	
24-27 n= 2	13.14±2.17		13.00±5.20		12.67±2.82		11.50±0.71	
28 28-31 n= 2	16.00±3.23	0.008*	10.33±2.36	0.373	13.33±1.89	0.290	15.00±0.01	0.199
Age group at onset of deafness								
0-5 n=86	12.71±2.42		11.84±2.69		11.87±2.61		11.45±2.33	
>5 n=15	12.54±2.86	0.797	12.64±2.51	0.787	12.51±2.95	0.392	10.75±2.14	0.239
Type of school								
Special n=29	13.39±2.21		12.14±2.77		12.96±3.04		12.60±2.34	
Partial mainstream n=31	12.33±2.23		11.20±2.22		11.82±2.28		10.93±1.95	
Total mainstream n=42	12.40±4.49	0.182	11.78±2.75	0.182	11.39±2.5	0.046*	10.76±2.23	0.002*
Communication at home								
Lip reading n=8	12.29±2.55		10.92±2.71		12.17±2.51		10.87±2.17	
Writing n=36	12.65±2.21	0.878	11.83±2.68	0.535	12.59±2.75	0.186	11.14±2.63	0.618
Sign language n=58	12.75±2.66		12.03±2.63		11.56±2.58		11.52±2.12	
Parent's hearing status								
Deaf and deaf n=9	12.25±2.28		11.56±3.21		11.85±2.71		11.30±1.54	
One deaf n=3	13.33±2.57		12.21±3.85		11.56±4.30		12.00±2.29	
Both hearing n=90	12.70±2.51	0.789	11.90±2.65	0.912	12.01±2.63	0.951	11.31±2.38	

*in the table represent the significance differences in the groups compared at $p \leq 0.05$

Table 4.7: Post hoc test results of the social and environment domains of WHOQOL across the deaf schools

Type of School			Sig	
Physical				
Psychological				
Social	Special	Partial mainstream	0.214	Df (2,99)
		Total Mainstream	0.038*	F= 3.182
	Partial mainstream	Total mainstream	0.765	
Environment	Special	Partial mainstream	0.011*	Df (2,99)
		Total Mainstream	0.002*	F= 6.863
	Partial mainstream	Total mainstream	0.946	

* in the table represent the significance of the post hoc tests between the different type of deaf schools

4.6 Correlation of Social Class and HRQoL Scores

Social class did not significantly affect any of the quality of life scores but correlation of the QoL scores against one another showed some significant differences which may suggest the interdependence of these domains in maintaining a full quality of life (table 4.8). Physical health was found to be positively correlated with psychological health ($r= 0.298$, $p= 0.002$), social relationship ($r= 0.418$, $p= 0.001$) and environment QoL ($r= 0.338$, $p= 0.001$). Psychological health was equally found to be positively correlated with environment QoL ($r= 0.531$, $p= 0.001$). Similarly, respondents' social relationship score was also positively correlated with environment score ($r= 0.323$, $p= 0.001$) (table 4.8).

Table 4.8: Correlation of Social Class and HRQoL Scores

		1	2	3	4
1. SOCIAL CLASS					
2. QOL-physical	r	1.292			
	p-value	0.198			
3. QOL-psychological	r	0.192	0.298*		
	p-value	0.061	0.002		
4. QOL-social	r	0.226	0.418*	0.189	
	p-value	0.082	0.001	0.056	
5. QOL-environment	r	0.301	0.338*	0.531*	0.323*
	p-value	0.213	0.001	0.001	0.001

*Correlation is significant at the 0.05 level (2-tailed).

r is coefficient of correlation

CHAPTER FIVE

DISCUSSION

There is growing clinical interest in the effects of impaired hearing on the individual, their family and wider social circles because hearing impairment is experienced interpersonally and can affect quality of life of the individuals in all domains (Justice and Searls, 2010). A large body of published work has shown that hearing loss has a detrimental effect on overall or individual quality of life measures, regardless of whatever scales are used to assess the impact of hearing loss (Ademokoya, 2007; Hallahan and Kauffman, 1994; Heward, 2000).

5.1 Hearing-Impaired Students and School

Respondents for this study were from both the inclusive and special schools. This suggests that hearing-impaired students in Nigeria benefit from both segregated and integrated placements as complementary forms of social experience that each contribute to their overall adjustment (Musselman *et al.*, 1996) but how well these schools are equipped to meet the needs of the hearing-impaired child becomes questionable. Three of the schools for the study are government owned (public) schools and the special school is a private school. Findings from this study showed that the type of deaf school attended affects respondents' QoL scores in physical health, psychological health and environment domains. This result is consistent with Heather (2007) who also found that the type of school hearing-impaired children attend affect them not only academically and psychologically but also socially. Students in the special school had the highest score in all domains examined. This result is consistent with Bat-Chava (1994) who also noted that type of school has a great influence on the perceived quality of life of adolescents with

hearing impairment. He further explained that although hearing-impaired children could benefit from both special and mainstream schools, hearing impaired individuals in special schools will tend to have good quality of life because children in this school learn and socialize in an environment that fosters the acceptance of deafness instead of treating it as a deficiency. Moreover, this group of hearing impaired students also do not face negative attitudes from hearing students which might protect and enhance their quality of life unlike their colleagues in mainstream schools who are likely to face criticism and discrimination from hearing students (Bat-Chava, 1994, Schirmer, 2000). Nevertheless, hearing-impaired students in mainstream schools have the opportunity to interact with other non-hearing impaired students; this is beneficial since it gives them the chance to learn how to function in the hearing world (Kluwin, 1999, Luckner, 1999). Another possible explanation for a better QoL among the special school students could be that, because most public schools in Nigeria are overcrowded and over populated, little or no attention is paid to the special child. Furthermore, there may not be enough personnel skilled in sign language use and instructional materials in the government owned schools (Fuandai, 2011).

5.2 Demographic Characteristics of the Hearing Impaired Students

This study had more females (55.9%) than males (44.1%) with mean age of 17.8 ± 2.8 years. This is in contrast to a study among hearing impaired and hearing adolescents in Nigeria which had 48% males 30% females with mean age of 17.1 ± 3.0 years (Sangowawa *et al.*, 2009). Although hearing loss is more common in males than in females of all age groups (CDC, 2014), the findings of this study may be as a result of the sample size used. In addition, some of the students for this study were older than 20 years but this is not unexpected as children with disability do

not start school early like their non-disabled counterparts. A study in Austria revealed that a child with disability start school later and stay longer in school than non-disabled children (ABS survey of disability, ageing and caring, 2009). For the hearing impaired in particular, the hearing loss can affect the age the child begins school since speech development, language and social skills are important to schooling (CDC, 2014). From this study, majority of respondents had hearing parents this is consistent with results of another study that reported that 80% of hearing-impaired adolescents have hearing parents (Ridgeway 1993). This may suggest that hearing impairment in majority of the respondents considered may not be genetic or hereditary.

5.3 Hearing Impaired Students and Communication at Home

Hearing-impaired people communicate using sign language, lip reading, writing but often times use the sign language as indicated by nearly 78% of the study population who reported sign language as their most preferred language of communication. Majority (88.8%) of the study population had hearing parents and reported communication with parents as good. This is in contrast to another study where approximately 90% of hearing-impaired adolescents have hearing parents and reported experiencing impaired communication at home (Ridgeway 1993 and Heather, (2007). A possible explanation for this variation could be as a result of the local sign language being used in the settings examined; there was no need for parents to go through a formal training to learn the local sign language unlike the British and American sign languages that needs to be learnt formally. Communication between hearing-impaired adolescents and their parents may not be as bad compared to settings where only the English sign language is the means of communication and many parents may not have learnt this language. However, Heather, (2007) believes that only few parents have developed a method for communicating with

their adolescents and regardless of the type of communication used with the hearing impaired child at home, the hearing impaired adolescent is still likely to feel disconnected from the family especially during family times such as watching the television, talking during meal times (Heather, 2007). On the other hand, hearing impaired children born to hearing impaired parents may not have difficulty communicating since sign language is usually their natural language and in families with more than one hearing impaired person, they will feel more accepted as opposed to a family with only one hearing impaired child and the child is likely to feel isolated from other members of his family (Marschak, 2007).

5.4 Respondents' Overall Perception of Quality of Life

Majority (62%) of the respondents rating their QoL as poor is similar to the findings of one study where general life satisfaction in deaf or hard of hearing youth was found to be poor in the areas of self, family, friends, and living environment (Patrick, *et al.*, 2010). This shows that there is a way every individual perceives their quality of life regardless of what the environment or society says and hearing impaired people are not exempted from this. While many reasons may be accrued for an individual's dissatisfaction with their quality of life, any disability at all is a threat to existence and more often than not impact upon the quality of life of an individual. Hearing impairment has been reported to have debilitating effect on the quality of life of an individual (Fellinger *et al.*, 2005). Evidence exist from literature that a positive -appraisal of one's health may alleviate the deleterious effect of disability on life satisfaction (Edwards *et al.*, 2002).

Although an individual's perception of his quality of life may be dependent on some personal and environmental factors which were elucidated in some of the domains later considered, this question required hearing impaired students to give an overview of the way they perceived their

quality of life. Perceived QoL is defined as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, standards, expectations and concerns (Patrick *et al.*, 2005). Diener *et al.*, (1999) reported that "Life satisfaction was predicted by subjectively interpreted health, which was influenced by both negative affect and objective health: If people can find a way to appraise their health positively, the adverse impact of disability on life satisfaction can be mitigated"

5.5 Respondents' Satisfaction with General Health

Satisfaction with health, family and finances are most important for overall life satisfaction and by extension overall quality of life. It is therefore likely that these are the areas of life people reflect on when they assess their personal well-being (Plagnol and Scot, 2008). More than half (56%) of study respondents reported dissatisfaction with their health: This may suggest that hearing impairment although a physical disability; have a bearing on all other aspects of an individual's health and wellbeing. Furthermore, people who are sick or disabled are generally more likely to need health care because of their frequent call at health care delivery centers and also have higher tendency to be less satisfied with their health care than those who are well. One explanation for this is that people with greater health needs have more interactions with the health care system and therefore also have more opportunities to be disappointed (Iezzoni *et al.*, 2002). Certainly, people with significant health problems are more likely than others to need timely care involving a range of services and to want information about their conditions, prognoses, and treatment options. With more treatment decisions and interventions comes more chance of mishap, involving both technical and interpersonal quality of care (Iezzoni *et al.*, 2002). These people are considered to be at an increased risk for secondary conditions, such as

musculoskeletal or mental health problems consequent to the primary disabling condition (Healthy People, 2010). For the hearing impaired in particular, there is every probable reason that there will be dissatisfaction with the health care they receive as a result of impaired communication with health care service providers which can invariably cause dissatisfaction with their health status

5.6 Physical Health of the Hearing-Impaired

Poor scores obtained by respondents in physical health and insignificant difference between males and females ($t= 1.07$, $p= 0.29$) observed in the study is consistent with Fellingner *et al.*, (2005)'s study. Among the many factors that could be responsible for this, difficulty in accessing health care services is a common experience of hearing-impaired people; because communication barrier is experienced not only by hearing-impaired people but also by health care providers when it comes to communicating within a health care setting (Vedrani *et al.*, 2006). This poses a particular problem to accessing quality health care services since primary health care depends heavily on effective communication between patient and health care provider to ensure quality health service delivery (Iezzoni *et al.*, 2004; Law *et al.*, 2005). It has been documented that impaired communication experienced by hearing-impaired people in health care settings is one of the main reasons why hearing impaired people use health care services less frequently (Arulogun, 2013). Due to these complex individual, interpersonal and systemic factors, hearing-impaired individuals have reportedly often received inadequate, inappropriate and unethical health care (Harmer, 1999). Studies of health care and hearing impaired people in other parts of the world have produced conflicting results: while some studies indicate poorer health status and increased health services utilization among these people (Kurtz

et al., 1991; Ries, 1977; Zazove, 1993), other studies have shown that people with hearing loss have decreased health services utilization (Ebert and Heckerling, 1955; Pollard, 1994).

Although physical health did not significantly differ across the different schools for the deaf, students attending special school scored slightly higher than those in partial and total mainstream schools. Among other factors, the socioeconomic background of these children could be an explanation for this slight variation: majority of those from the upper social class (72.4%) were students in special school while the majority of students from the total mainstream (47.6%) and partial mainstream schools (58.1%) were from the middle class. There is a difference in the health outcomes of people in varying social classes because socioeconomic class affects an individual's access to health care. In Australia, people who are richer can expect to live an average of six years longer than the poor (Friel, 2014). People who are socially disadvantaged have a higher risk of chronic diseases (Friel, 2014). Social class whether measured by occupation, income or education has a marked effect on physical health and there is always a gap between the advantaged upper socioeconomic classes and the disadvantaged lower classes (Fein, 1995). Furthermore in western countries generally, an individual's socioeconomic status has been shown to be closely related to mortality, morbidity and health-related behavior and access to health care services (Kagamimori *et al.*, 2009). In Nigeria, a study among hearing impaired students showed that a higher incidence of disease was reported by respondents whose parents had secondary education and below compared to those with a university education or its equivalent (Olawuni, 2008)

In addition, a positive correlation between physical health and psychological health ($r=0.298$, $p=0.002$) in this study could suggest that improved physical health may lead to improved

psychological health. An individual who is frequently physically ill or disabled may most likely have elevated level of psychological distress as a result. Amongst other factors that could cause distress in sick or disabled people is the thought of been unable to engage in activities like attending school or going to work place (as a result of ill health) hence limiting such an individual's prospects and income. Thoughts of having to depend on people to meet one's need may also cause feelings of depression, anxiety and worry about the future. Similarly, physical health found to be positively correlated with social relationship ($r= 0.418$, $p= 0.002$) suggests that improved social relationship can infer a better physical health. A study carried out among adults in California showed that social interaction is a predicator of physical health; healthy adults who were socially integrated had a better physical health and were more likely to be living after a nine year follow up compared to their more isolated counterparts (Cohen, 2004). Greater social integration as assessed by the numbers of social roles an individual engages in was associated with less susceptibility to clinical illness (Cohen *et al.*, 1997).

Furthermore, a positive correlation existing between physical health and environment QoL ($r= 0.338$, $p= 0.001$) indicates that an improved environmental quality of life may suggest a better physical health. It is expected that access to health services, ability to move around with little or no difficulty and having enough money to meet one's needs especially health needs could infer a better physical health. The characteristics and quality of housing directly affect an individual's physical health (Shaw, 2004). Wells and colleagues reported that most of the major health problems plaguing the U.S. population today ranging from psychological distress to heart disease to diabetes have significant environmental causes (Wells *et al.*, 2010). Access to a good

environment improves cognitive functioning and improves recovery from surgery and illness (Wells *et al.*, 2010).

5.6 Psychological Health of the Hearing-Impaired.

The psychological health domain of the WHOBREF measures general psychological health and respondents showed poor scores which corroborates result of previous studies where deaf people are reported to have a high level of psychological distress irrespective of their gender, age or instrument used for assessment (Fellinger *et al.*, 2005, Clausen, 2003; Eide and Gundersen 2004). Kyam *et al.*, (2007) also reported more mental health problems in a population of deaf adults in Norway. Although several reasons may be adduced for the high psychological distress among the deaf population, lack of good communication (a way many people use to free their minds of stress, disappointments and issues) ability is a common experience for hearing impaired individuals growing up in a hearing society (Ridgeway, 1993). Moreover many deaf people have been victims of abuse in the society, and this may be another contributing factor (Fellinger *et al.*, 2005 and Ridgeway, 1993). Females had poorer psychological health than males (although difference was not significant); this result is similar to a Dutch study where deaf females reported more mental health complaints than males (de Graaf and Bijl, 2002). Similarly, another study in Norway found that deaf females had more mental health problems than deaf males although the difference here was also not statistically significant. In contrast, Tambs, (2004) found more mental health problems among deaf males. In general, it has been argued that exposure to stress arising from the unique experiences of women such as responsibilities as mothers and housewives accounts for why more women than men are more mentally ill (Gove and Geerken, 1977). Although little has been written about how males and females differ in their

vulnerability to stress, biological arguments about female frailty and ineffective coping suggest that stress may have a more severe impact on females than on males (Kessler, 1979). This study did not show a significant effect of communication at home on psychological health but Fellingner *et al.*, (2012) reported that effective communication with family and peers is desirable among the hearing impaired and does have a positive effect on their psychological health.

This study also showed a better psychological health among children who were above age five before onset of deafness compared to those who became hearing-impaired between period of birth and age 5 (although the difference was not significant but this could be a factor of the small sample size used). This result corroborates some studies that have shown that prelingually deaf individuals are usually more psychologically distressed than the ones who became deaf after learning the language of the environment (Fellinger *et al.*, 2012). Similarly, Kvam *et al.*, (2006) have also reported that children born deaf are more likely to have a higher psychological distress stating that inability of parents to understand toddler's reaction and communication before child was diagnosed as deaf may be a source of stress for the child. On the other hand, Luey *et al.*, (1995) showed a lower quality of life (this includes level of psychological distress) among individuals who became deaf after the age of 3 compared to those who became deaf earlier in life. Similarly, de Graaf and Bijl, 2002 also found more symptoms of mental distress among a group that became deaf after age 3 than among those who had been deaf since the early months of life. The insignificant effect of communication method used at home and age at onset of deafness on QoL observed in this study may be because of the sample size and the fact that many of the respondents may not be certain of the age they became hearing impaired since parents were not interviewed.

5.7 Social Relationship of the Hearing-Impaired

Respondents' social relationship score was not as poor as anticipated even though hearing loss of any kind at all is a threat to social identity and can lead to self-stigmatization (Hetu, 1996). This self-stigmatization can be seen in their anticipating difficult communication situations, especially in social gatherings, group conversation, interactions with salespersons, in banks, or with medical personnel. This anticipation in itself is filled with anxiety and frustration, and may lead to avoidance of social interactions (Hetu, 1996). Results of this study is similar to Fellingner *et al.*, 2005 who also reported that deaf people in Austria did not have a poor social relationship. Austria being a first world country provides great opportunities and often provides a better life for her deaf people because there is language accessibility, interpreter services and disability rights (Justice and Searls, 2010). In Australia, 83% of deaf and hard of hearing children are in regular classrooms and are being taught orally. There was relative satisfaction with academic performance, but majority of deaf and hard of hearing students had difficulties with socialization as teachers reported that two-third were at competitive levels academically, but only one-third were being socially well integrated (Hyde *et al.*, 2006). Similarly, in Norway, one third of deaf children are in regular classes after receiving short-term clustering arrangements at Resource Centres for deaf students to promote their competence in Norwegian sign language NSL. The remaining students are in schools or classes for deaf students, with some students with lesser degrees of hearing loss in regular classes although there is little interaction among deaf and hearing children (Hyde *et al.*, 2006). These results could be because these countries are developed areas and many of them provide great opportunities and a better life for their deaf (Justice and Searls, 2010). Interestingly, most of these deaf friendly facilities are not even available in Nigeria; the result obtained could be attributed to sample selection bias or because

study population comprised of individuals in school settings who may have somewhat learnt how to build their social competence over time by their continual attendance in school. In school, the hearing impaired learn life building and negotiation skills as against ordinary hearing impaired people in the community who may never have learnt how to build confidence in themselves, initiate conversation or maintain a level of interaction with hearing people.

Students in special school showed significantly higher social relationship than those in partial and total mainstream school but students in partial mainstream school did not significantly differ from those in special and total mainstream school. Taken together, these results suggest that separating hearing impaired students from hearing students do have an effect on their social relationships. However, it should be noted that separating them completely (putting them in special school) is needed to see an effect on their social relationship. Residence in a deaf community as observed in the special school setting appears to shield them from hassles in the hearing world, but this may not be supportive to their adaptation outside school walls when they now have to interact with the larger society comprising mainly of hearing people or use facilities such as hospitals, banks, filling stations and public transport which do not have deaf friendly services such as language accessibility or interpreter services.

5.8 Environmental Quality of Life of the Hearing-Impaired

The poor environmental QoL score observed in the population studied could be because there are no special provisions for hearing-impaired people in facilities such as health, transport, banks in Nigeria leading to difficulty in accessing these facilities by the hearing-impaired. Results corroborate Fellinger *et al.*, (2005) who also reported a poor environment score among deaf

people in Austria. This assertion from Austria may not be based on availability of deaf friendly services but on other factors (that may require further research). A higher environment score found in students attending special school could be because students in the special school examined were resident in school and have some facilities that could make communication and life easier inside school. They may not likely face as much difficulties as their colleagues attending partial and total mainstream schools which are non-residential schools. In many developing countries like Nigeria, efforts made to integrate deaf people into the society are usually non-existent or feeble at best as they are a minority group. There is no language accessibility, interpreter services or disability rights as found in some developed countries such as Europe and North America (Justice and Searls, 2010). Furthermore, a positive correlation existing between environmental QoL and psychological health ($r= 0.531, p= 0.001$) of the study population suggests that an improved environmental quality of life could confer a better psychological health. Inability to move around, lack of financial capability to meet one's needs such as affording a good accommodation and accessing health care service may inflict anxiety, worry and depression on an individual. A positive correlation between social relationship and environment QoL scores indicates that improved environmental QoL may improve interaction in hearing impaired people. As expected, like for everyone else, a friendly environment fosters good social interaction.

5.9 Social Class and Quality of Life

Social class was found to affect only the environmental QoL. This may suggest that improved socio-economic status may cause an improvement in the environmental QoL; but overall, the effect of the disability on their QoL outweighs the impact of their socio-economic status unlike

in the general population where higher socio-economic class is thought to suggest a better quality of life. There is the existence of considerable indirect evidence that people in low social class have less access to social support which is believed to be resources to help a person cope with life problems thereby affecting their psychological health (Kessler, 1979). In addition, people from lower social classes are disadvantaged as they are exposed to more stressful experiences than upper class persons, and these events have comparable impact on their emotional functioning more severely than on the functioning of people from the upper class (Kessler, 1979). Similarly, Dohrenwend (1973) found that the poor in urban settings were exposed to more stresses than persons in the middle class and that the relationship between exposure to stress and psychological distress was higher in people from the lower social class than in the middle class. Although this study did not find a significant effect of social class on psychological health of the study population, another study showed a higher prevalence of mental disorders among children from lower social class; these children were approximately three times more likely to have a mental disorder than those from the upper social class with prevalence of mental disorder increasing with decrease in social class (social class here was measured by the occupation of head of household) (Meltzer *et al.*, 1999). Similarly, Maughan, 1995 also reported that conduct disorder was more common in children from lower social groups compared to those from the higher social groups. Of the nearly one-third who came from the upper social class, majority were students attending the special school, which could be an explanation for why this group of students have a higher score in all the domains examined compared to their counterparts attending other schools.

5.1 CONCLUSION

This study provides valuable information on the quality of life of hearing-impaired students attending special and mainstream schools in Ibadan, Nigeria. The poor quality of life found in all groups of hearing-impaired students in nearly all domains except in their social relationship regardless of their social class suggests that the impact of the disability on their quality of life outweighs the impact of their socio-economic status. The type of deaf school attended was found to affect their social relationship and environmental quality of life and students in special school seem to be better than those in partial and total mainstream schools in all domains examined. The better social relationship found among students in special schools compared to those in total and partial mainstream schools in their environment and social relationship domains suggests that the deaf community created in the special school provided a form of protection against stigma and discrimination and promoted their social interactions. In general, most of the quality of life domains measured seems to be interrelated. An improvement in one will lead to an improvement in the other; this suggests that efforts concentrated at improving one aspect may invariably lead to improvement in some other areas. For instance, improved social relationship will cause an improvement in their physical health and environment quality of life. Concerted efforts made to improve their psychological health will invariably improve their social relationship and environment quality of life.

5.2 RECOMMENDATIONS

Following the findings of this study, the following recommendations are made:

1. Efforts should be made by all stake holders- parents, teachers, government to provide good listening environments and accessible services to them; this could be in the form of

increased interpreter services in major places such as school and health centres. Dysfunctional communication can easily lead to a weakened motivation in social situations, unnecessary fatigue and invariably social isolation which all contribute to poor psychological health.

2. Creation of policies that will help hearing-impaired people to identify and recognize their rights to raise issues of importance to them which could invariably improve their QoL. For instance, Social policy could entail ways to ensure a satisfactory standard of living, security and comfort for all including the disabled; this would improve their social interactions and environmental QoL. Welfare policy could possibly aim at removal of poverty and extreme social inequalities. Disability Policy program could propose that through societal empowerment, every disabled person would have the opportunity to lead a good and meaningful life according to his or her own abilities and goals. Opportunity to live an independent life, equality in relationships, and full participation should also be included in this policy.

3. Since these are school children and they spend ample time in school, it is necessary for teachers and school authorities to also seek ways to help these children within school walls: Authorities of schools for the deaf could decrease teacher to student ratio, provide more interpreter services, and provide facilities in school that could facilitate socialization between hearing-impaired children and their hearing peers. Teachers in mainstream settings can help hearing-impaired children learn better and foster a supportive classroom by becoming aware of the child's challenges, showing sensitivity to their special communication needs, and willingness to be flexible by continually adapting and modifying teaching strategies.

4. Teachers and parents could help instill positive coping strategies in hearing-impaired children and promote activities that foster inclusion. School authorities should also demand for audiology test results of each child from parents before registering the child so as to make correct placement (and referral if the case warrants) and also make continuous audiology test for students a routine; this will enable them detect any new problems experienced by students and this can be nipped in the bud before situation worsens. Early intervention has the potential to transform their lives. For instance, the use of hearing aid has been found to improve social relationships, physical health and psychological health of the hearing-impaired.

5. The social relationship of the hearing-impaired could also be improved by providing opportunities to meet other hearing-impaired students on a regular basis.

Overall these children should be educated in a systematic way focusing on the development of a positive self-concept and improved social competence; good social interaction has been proven to have a positive bearing on psychological and physical health of individuals.

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Appendix I

QUALITY OF LIFE ASSESSMENT OF DEAF STUDENTS IN IBADAN, NIGERIA.

IDENTIFICATION NUMBER:

DATE:

Section A: Socio-Demographic Characteristics

Tick or specify as appropriate.

1. Name of school Methodist CMC IMG Ibadan school for the
deaf Others, specify
2. Type of school 1. Special 2. Integrated 3. Mainstream
3. Class
4. Age at last birthday
5. What is your Sex? 1. Male 2. Female
6. What religion do you practice? 1.Christianity 2.Islam 3.Others
7. Tribe 1. Yoruba 2. Igbo 3. Hausa 4. Others (specify)
8. Family set up 1. Monogamous 2. Polygamous
9. No of children in family.....
10. Father's work
11. Mother's work
12. Father's Educational level
13. Mother's Educational level

Section B. Information on Deafness

14. Is there any other deaf person in your family? Yes No
15. Are you 1. Deaf and dumb 2. Deaf only
16. Were you born deaf? Yes No
17. If no, how old were you when you became deaf?
18. What communication method do you find most convenient to use? 1. Lip reading 2. Sign
language 3. Writing 4. Others (specify)

19. Parent's hearing status 1. Deaf and deaf 2. Deaf and hearing 3. Hearing and hearing

20. Communication method used in school 1. Oral 2. Writing 3. Sign language 4. Sign lang. & writing 5. others(specify)

21. Communication used at home 1. Oral 2. Lip reading 3. Writing 4. Sign language

22. How would you rate your communication with your parent? 1. Very poor 2. Poor 3. Neither poor nor good 4. Good 5. Very good

Section C: Health Related Quality of Life Assessment

The following ask you **how you feel** about your quality of life, health or other areas of life. Please choose the Answer that appears most appropriate. If you are unsure of what answer to give to a question, the first is usually the best one. Please think about your life in the past 4weeks. **Your quality of life is how happy, comfortable and healthy you feel.**

		Very poor	Poor	Neither poor nor good	Good	Very good
1	How would you rate your quality of life					
		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
2	How satisfied are you with your Quality of Life					

The following questions ask about **how much** you have experienced certain things in the last 4weeks

		Not at all	A little Bit	A moderate amount	Very much	A extreme amount
3	To what extent do you think physical pain prevent you from doing what you need to do?					
4	How much do you need any medical treatment to function in your daily life?					
5	How much do you enjoy life?					
6	To what extent do you feel					

	your life to be meaningful?					
7	How well are you able to concentrate?					
8	How safe do you feel in your daily life?					
9	How healthy is your physical environment?					

The following questions ask how completely you experience or were able to do certain things in the last 4 weeks.

		Not at all	A little	Moderately	Mostly	Completely
10	Do you have enough energy for everyday life?					
11	Are you able to accept your bodily appearance?					
12	Do you have enough money to meet your needs?					
13	Do you have enough information for everyday life?					
14	To what extent do you have opportunity for leisure activities?					
		Very poor	Poor	Neither poor nor good	Good	Very good
15	Do you find your way easily when you go out?					
		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
16	How satisfied are you with your sleep?					
17	How satisfied are you with your ability to					

	perform your daily living activities?					
18	How satisfied are you with your capacity for work?					
19	How satisfied are you with yourself?					
20	How satisfied are you with your Personal relationships?					
21	How satisfied are you with your sex life?					
22	How satisfied are you with the support you get from your friends?					
23	How satisfied are you with the house you stay?					
24	How satisfied are you with your access to health services?					
25	How satisfied are you with your Transport?					

The following question refers to **how often** you have felt or experienced certain things in the last two weeks.

		Never	Seldom	Quite often	Very often	Always
26	Are you often sad, despaired, depressed or anxious?					

Appendix II

Consent form

IRB Research approval number:

This approval will elapse on:

Title of the research: QUALITY OF LIFE ASSESSMENT OF DEAF STUDENTS IN IBADAN, NIGERIA

This study is being conducted by Jaiyeola Taiwo Mofadeke of the Institute of Child health, College of Medicine University of Ibadan, Oyo State, Nigeria. The purpose of this study is to assess the quality of life of deaf students in Ibadan, Nigeria.

Study participants will be obtained from all the deaf schools in Ibadan. Investigator will address respondents through a sign language interpreter. Questionnaires will be administered to the students in their classrooms and will be collected back after they have been filled. A total of 193 deaf students from all the deaf schools in Ibadan will be used for the study. The interviewer and other participants will be present during the interview. Each interview will take about 30 minutes to 45 minutes

There are no physical risks associated with participation in this study. However, a child may be uncomfortable with some of the questions he/she will be asked. But, he/she may decide not to answer any questions he/she may feel uncomfortable about.

A Child's participation in this research is absolutely voluntary and will not cost anything. There are no direct and immediate benefits for participation in this study. A child's participation in this study may provide the basis for relevant authorities to develop interventions that could improve the quality of life of deaf people and also to put them into consideration when setting up public facilities such as hospitals in Nigeria. All information collected cannot be linked to any child in any way as the child's name will not be collected. As part of my responsibility, only the researcher, members of the research team and representatives from the **Universities of Ibadan** and/or **UCH Ethical Committees** may have access to study records. They are required to keep

every child's/ward's identity confidential. Results of this study may be used for research publications, or presentations at scientific meetings, but the child's results will never be discussed as an individual. No identifying information will be kept on the actual survey form so nobody will be able to connect any child's name to the survey.

Statement of person giving consent:

Now that the study has been well explained to me and I fully understand the content of the study process, I hereby agree to allow pupils in my school to be a part of the study.

DATE: _____ SIGNATURE: _____

NAME: _____

Detailed contact information

This research has been approved by the Ethics Committee of the University of Ibadan and the Chairman of this committee can be contacted at Biode Building, Room T10, 2nd Floor, Institute for Advanced Medical Research and Training, College of Medicine, University of Ibadan, Telephone: **08032397993**, E-mail: **uiuchirc@yahoo.com**. In addition if you have any questions about your participation in this research, you can contact the principal investigator, JAIYEOLA TAIWO MOFADEKE at Institute of Child health, University college Hospital Ibadan. The Phone and E –mail address are 08066580105 and feddie4real@yahoo.com.

Appendix III

Details of questions in the WHOQOL-BREF instrument from which domains scores were computed

	Range of obtainable score	Question on WHOBREF
How would you rate your QOL	1-7	Question 1
Satisfaction with health	1-7	Question 2
Physical	7-35	Questions 3,4,10,15,16, 17&18
Psychological	6-30	Questions 5,6,7,11,19&26
Social	3-15	Questions 20,21&22
Environment	8-40	Questions 8,9,12,13,14, 23, 24&25

‘How would you rate your QOL’ is a stand-alone item that requested respondents to rate their overall quality of life. It has scores ranging between 1 and 7

Satisfaction with health is another stand-alone item examining respondents’ degree of satisfaction with their general health. It has scores ranging between 1 and 7

Physical health domain comprises of seven questions focusing on activities of daily living, dependence on medicinal substances and medical aids, Energy and fatigue, Mobility, Pain and

discomfort experienced, sleep and work capacity of the respondents. Minimum and maximum obtainable score on this domain was 7 and 35 respectively.

In the psychological health domain consisting of six questions concentrating on bodily image and appearance, negative feelings, positive feelings, self-esteem, spirituality and religion, personal belief and thinking, learning, memory and concentration of the respondents, obtainable scores ranged between 6 and 30.

The social relationship domain contained only three questions focusing on personal relationships, social support and sexual activity of the respondents and the minimum and maximum obtainable score in this domain are 3 and 15 respectively.

The environment domain has eight questions, measuring the financial resources and freedom, physical safety and security, accessibility and quality of health and social care, home environment, opportunities for acquiring new information and skills, participation in and opportunities for leisure activities, physical environment (pollution / noise / traffic / climate) and transport experiences of the respondents. It had scores ranging between 8 and 40.

Appendix IV

Socio-Economic Classification

Occupation classification

Class 1: senior public servants, professionals such as doctors, bankers, managers, large scale traders, businessmen and contractors and similar grades

Class 2: intermediate grade public servant, senior school teachers and similar grades

Class 3: juniors school teachers, drivers, artisans and similar grades

Class 4: petty traders, labourers, messengers and similar grades

Class 5: the unemployed, students, full-time house-wives, subsistence farmers.

Educational classification

Class 1: University graduates or equivalents

Class 2: SSCE and OND/NCE/ NABTEB

Class 3: SSCE, grade II or equivalents

Class 4: Modern III, Primary Six

Class 5: Illiterate, just able to read and write

Each parent was assigned a score corresponding to the class of occupation they belong and educational level attained making four scores for each respondent who had both parents. The mean of the four scores was then calculated and approximated to the nearest whole number to determine the social class the respondent is assigned.

Social Class = $\frac{\text{Mother's education} + \text{father's education} + \text{mother occupation} + \text{fathers occupation}}{4}$

Class I: 0.5-1.25

Class III: 2.5-3.25

Class V: 4.5-5.0

Class II: 1.5-2.25

Class IV: 3.5-4.25

Classes I and II are the upper classes, class III is the middle class and classes IV and V are the lower classes.

N.B: for respondents with a single parent or guardian, average of the education and occupation of that single parent was used to compute social class.