KNOWLEDGE OF CLINICIANS TO SCREEN CHILDREN UNDER THE AGE OF FIVE YEARS FOR DEVELOPMENTAL DISABILITIES AT TWO SELECTED HOSPITALS IN LUSAKA DISTRICT, ZAMBIA

MASTER OF SCIENCE IN CHILD HEALTH NURSING THESIS

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UNIVERSITY OF MALAWI

KAMUZU COLLEGE OF NURSING

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By

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BSc (Nursing) – University of Zambia

Thesis submitted to Kamuzu College of Nursing in Partial Fulfilment of the requirements for the Master of Science Degree in Child Health Nursing

University of Malawi
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DECLARATION

I, Mutinta Fanny Hatontola Kasaro, declare that this dissertation on **"knowledge of clinicians to screen children under the age of five years for developmental disabilities at two selected hospitals in Lusaka District, Zambia"**, is entirely my own work from sources which I have explicitly acknowledged.

MUTINTA FANNY HATONTOLA KASARO

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Signature: 

Date: 9th April 2021

CERTIFICATE OF APPROVAL

We, the undersigned, hereby certify that we have read and satisfied that this is the original of the author under whose name it is presented. We, therefore, confirm that the work has been completed and ready to be presented to the examiners a dissertation titled "Assessing knowledge of clinicians to screen children under the age of five years for developmental disabilities at two selected hospitals in Lusaka District, Zambia".

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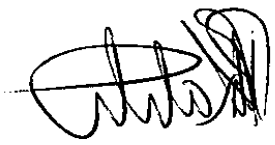

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DEDICATION

I dedicate this thesis to my late parents Mr. Bothwell Paul and Mrs. Esnart Buumba Hatontola for the educational background they lied in me, my husband Isaac P.B. Kasaro, and our children: Nchachi, Nchimunya, Lage and Isaac, and our grandson Masowe for their support regulates my life.

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ABSTRACT

Globally, about 93 million children have disabilities. Early identification of developmental disabilities (DDs) and application of measures to habilitate the affected can help such children reach their full prospective. Clinicians who regularly attend to children under the age of five years are the best people to identify children with DDs. The objective of this research was to assess clinicians' knowledge to screen DDs in children under the age of five years from two selected hospitals in Lusaka, Zambia.

A quantitative cross-sectional study was conducted from clinicians drawn from selected two hospitals in Lusaka district. Eighty-eight participants answered a self-administered questionnaire. Multiple logistic regression analysis was conducted to examine the association between participants' socio-demographic characteristic and awareness of risks for children to develop DDs and the knowledge to screen for DDs. The data was analysed using Stata 13.1. A p-value of < 0.05 was considered statistically significant.

Participants' median age was 28 (IQR, 25-36.6) and the majority 67 (76.14%) were females. Thirty-six (40.91%) of participants were aware of risks for under-five children to have DDs and only 27 (30.68%) of participants had the knowledge to screen DDs in children under the age of five years. Factors that are associated with awareness are participants' institution and profession. Physicians were the most aware of risks for children under the age of five years to have DDs while nurse-midwives were the least to be aware of risks for children under the age of five years to have DDs. Furthermore; participants' institution was associated with participants' knowledge. The study has shown that most clinicians do not routinely conduct developmental screenings. This might lead to under-detecting significant DDs. The study also agrees that screening instruments developed and used so far have had limitations in terms of key issues relevant to LAMI countries which may pose a challenge regarding compliance on the use of screening instruments and detection of DDs. There needs to be a tool that will promote relationships between care providers and caregivers at the community level.

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LIST OF ABBREVIATIONS AND ACRONYMS

ADR:	Adjusted Odd Ratio
CDC:	Centers for Disease Control and Prevention
CIs:	Confidence Interval
COMREC:	College of Medicine Research Committee
CPD:	Continuous Professional Development
CSO:	Central Statistical Office
DCD:	Developmental Co-Ordination Disorder
DDs:	Developmental Disabilities
DDT:	Dichlorodiphenyltrichloroethane
ICF:	International Classification of Functioning, Disability, and Health
IQR:	Interquartile Range
KCN:	Kamuzu College of Nursing
LAMI:	Low- and Middle-Income Countries
MoH:	Ministry of Health
UK:	United Kingdom
UNICEF:	United Nations Children's Fund
UNZABREC:	University of Zambia Biomedical Research Ethics Committee
USA:	United States of America
UTH:	University Teaching Hospital
WHO:	World Health Organisation

OPERATIONAL DEFINITIONS

Child:	Any human being below eighteen years of age
Clinician:	Frontline health care providers who offer clinical services to clients and/or patients. In this study, this will denote Physicians, Clinical Officers, Nurses who are midwives and general Nurses
Developmental disability:	Inability to perform activities which are appropriate for the age
Disability:	Impairments that limits one to perform certain activities freely
Knowledge:	Understanding of information concerning the subject that a person acquires by experience or study, either known by an individual or several people
Level One Hospital:	General Hospital
Screening:	A process of establishing individuals at risk of a specific health status threat

CHAPTER 1

INTRODUCTION

1.1 Introduction

According to World Health Organisation (WHO), disability is a broad term that embraces impairments that limits one to perform certain activities freely (WHO, 2015). United Nations Children funds (UNICEF) reports that children with disabilities may have been born with genetic conditions, suffered from severe injuries and or infectious diseases, had malnutrition, or exposed to environmental toxins (UNICEF, 2008). These conditions may have been treated successfully while the impact on children's ability may have received little or no attention during treatment (Miller & Rosenbaum, 2016). Children living in the poorest households are also at risk of having Developmental Disabilities (DDs) (UNICEF, 2008). The main categories of DDs are cognitive, vision, hearing, motor, epilepsy, language, and behaviour (Patel et al., 2011; UNICEF, 2008). According to Salomone *et al.* (2019), 52.9 million under-five children suffer from a range of DDs such as autism spectrum disorder, sensory impairment and cognitive disability.

Globally, about ninety-three million, or 5 percent of children and adolescents have disabilities (WHO, 2015). According to Gladstone *et al.*(2010), 80 percent of the children with disabilities live in developing countries. Furthermore, 52.9 million under-five children have DDs and about 95 per cent of these children live in developing countries where health care services are lacking (Olusanya et al. 2018; Salomone et al., 2019).

In the United States of America, about 15 per cent of the children have one or more DDs and more than four-fifth of those children only receive habilitation services after their third birth day (Vitrikas et al., 2017). Furthermore, in the sub-Saharan region, 6.4 per cent of the children have disabilities (Riggall & Croft, 2016). Additionally, Cortina *et al.* (2012) reported that one in seven children in sub-Saharan Africa has a major mental disability while one in ten of these children has a specific mental health disability. According to Banda and Kalaluka (2014), childhood disability accounts for 1.6 per cent of Zambia's population. However, this figure is likely to increase as the primary results from the National Disability Survey indicate that 7.2 per cent or 1,080,000 of the population of Zambia are persons with disabilities (Zambia Agency for persons with disabilities, 2017).

Disability is a health concern, a human right problem and developmental distress because of the challenges disabled people face in life such as stigmatisation, participation inequality, and living in areas of low standards among others (WHO, 2015). Additionally, disability can cause poverty among disabled people due to the inability to access services such as education and employment (WHO, 2015). The effects of poverty, such as stunted growth in childhood, results in poor cognitive development (Muhoozi et al., 2016). Mwaba *et al.* (2015), further revealed that several developmental milestones associated with motor, cognitive, and social skills development are achieved during the first twenty-four months of life when brain development is rapid. Similarly, Ertem and WHO (2012)reported that the best period to enhance child development is from birth to three years of life or the early childhood period. However, Black *et al.* (2015) argued that developmental milestones in children continue up to fifty-nine months, the period when they are sensitive to interventions.

Nevertheless, DDs occur according to the child's age and nationality with increased risk in children in developing countries due to low standards of living (Bornstein & Hendricks, 2013). In Zambia, the Ministry of Health (MoH) reported that children under five years of age are at risk of developing severe malaria attacks (MoH, 2014) and this predisposes children to DDs (Fink et al., 2013. Therefore, improving childhood health and developmental stages are cardinal because the early childhood stages are fundamental for one's future life (Mwaba et al., 2015; Olusanya et al., 2018; Sabanathan, Wills, & Gladstone, 2015).

Currently, there is a global emphasis to increase investment in early childhood programmes in low-income and middle-income countries (Sabanathan et al., 2015). The Sustainable Developmental Goals (SDGs) advocates for routine monitoring of all children' health and wellbeing to promote early childhood development (Olusanya et al., 2018). Screening for ability in children is necessary so that any deviation is noted early and habilitation services are initiated in time to yield good results for preventing disabilities (Ertem & WHO, 2012; Esposito et al., 2013; UNICEF, 2013). Ertem and WHO, 2012 further revealed that children in developed countries benefit from developmental screening during health visits as DDs are detected early and addressed. Regardless of the DDs screening conducted in developed nations, information about children with DDs is scarce (Olusanya et al., 2018). Clinicians' knowledge to identify indicators of DDs in children, through screening, can help to identify children with mild and moderate DDs (Urkin, Bar-David, & Porter, 2015).

Screening for DDs can best be done by using socially acceptable assessment tools (Gladstone et al., 2010; Bornstein and Hendricks, 2013; Ertem WHO 2012; Tzioumis,

et al., 2016), and appropriate techniques (Duderstadt, 2014). However, Ertem & WHO, 2012 noted that there is scant information available in developing countries concerning how health care systems are working with regard to early detection of DDs in children. Ertem and WHO concluded by stating that a technically reliable and valid tool which is short, user friendly and easy to learn and use tool is required in developing countries to enable clinicians to screen children for DDs. Nevertheless, in many countries in sub-Saharan Africa such as Zambia, there is limited information about the clinicians' knowledge to screen DDs in children under the age of five years. Therefore, this study was set out to assess the clinicians' knowledge to screen DDs in children under the age of five years.

1.2 Background

An individual's behavioural development starts from the third week of gestation and continues to early childhood with remarkable biological and functional development after birth, (Ertem & WHO, 2012; Jernigan et al., 2011). However, this development can negatively be affected by factors such as chronic illnesses which can lead to disability if little or no attention is paid to the functional and conceptual determinants when treating chronic conditions (Miller & Rosenbaum, 2016). Children who suffer critical illnesses risk having altered neurodevelopment (Berger et al., 2018). According to WHO (2015) globally, one in every twenty children below fifteen years lives with either moderate or severe disability. Still, at the global level, Gupta *et al.* (2016) showed that about 14 per cent of children do not attain their optimal development in childhood due to DDs. Furthermore, Olusanya *et al.* (2018) and Salomone *et al.* (2019) revealed that 52.9 million children under five years of age have DDs. Additionally, 95 per cent of these children are from developing countries and 54 per cent of the children with

DDs were males Olusanya *et al.* (2018). Furthermore, a systemic review by Banks *et al.*(2017) revealed that 81 per cent of the studies reviewed showed a link between poverty and disability, indicating that prevalence for disability was high in developing countries.

In the sub-Saharan Africa region, 45 per cent of the population is composed of children (Bakare et al., 2014). Although the mortality rate among children under the age of five years has reduced, some of the survivors live with some DDs as a result of the disease which they suffered (Bakare et al., 2014). According to Olusanya *et al.* (2018), the prevalence of DDs among children under the age of five years has expressively increased (71.3%) between 1990 and 2016. In Lagos state, in Nigeria 27 out of 3011 children under the age of three years screened positive for DDs (Bakare et al., 2016). Similarly, in Malawi out of the 7220 children screened for DDs, 2500 children had DDs of various types (Tataryn et al., 2017). According to Tataryn *et al.* (2017), about 1800 children per million people have hearing disability either due to preventable or curable conditions (Tataryn et al., 2017).

In South Africa above 100 out of 200 HIV positive children had one or more DDs (Brassell & Potterton, 2019). According to Brassell and Potterton (2019) ill-health, low birth weight and a reduced cluster of differentiation 4 (CD4) count contributed to the presence of DDs in HIV positive children. In concluding their findings, both Brassell and Potterton (2019) and Bakare *et al.* (2014) highlighted that there was a management gap for childhood neurodevelopmental disabilities in the two nations. Regarding the incidence of neurodevelopmental disabilities in Uganda, 62 (12.7%) out of the 487 infants aged between 9 and 12 months who participated in the study were found to have

neurodevelopmental disabilities (Namazzi, et al., 2019). Fifty-two (52 (10.7%) infants had social behavioural DDs while 9 (1.8%) of the children had severe DDst which affected either three of four domains (Namazzi, et al., 2019).

Disabilities and severe acute malnutrition co-existence. In Malawi 60 out of 938 children admitted with severe acute malnutrition had a clinically understandable disability (Lelijveld et al., 2020). Children who survive from malnutrition have stunted, and have the poor cognitive ability (Lelijveld et al., 2020).

According to the Central Statistical Office (CSO) of Zambia and MOH of Zambia, and International Classification of Functioning (ICF), (2014), 50 per cent of Zambia's population is under fifteen years of age. This signifies that half of the country's population is at risk of developing disabilities because this is the most at-risk age group for disability. Furthermore, although Zambia managed to achieve the fourth-millennium development goal which advocated for the reduction of under-five mortality by two-thirds by the year 2015 through scaling up health reforms, ensuring effective neonatal and child health services are brought as close to the family as possible as well as holding child health weeks twice yearly (Kipp et al., 2016), Zambia, as a developing country, has several children with malnutrition which predisposes the children to inadequate cognitive development and language ability (Aboud & Yousafzai, 2015). Furthermore, 54.4 per cent of Zambia's population is classified as poor which predisposes the population to ill health, and subsequently disability as a possible complication (CSO, 2016). According to Ertem and WHO (2012) countries with a high incidence of risk factors for DDs during early childhood development such as disease, malnutrition, iron deficiency and low birth weight among others are likely

to have high rates of children with DDs. Therefore, in developing countries emphasis should be placed on prevention as well as early identification of DDs within the primary health care systems (Ertem & WHO, 2012). However, in Zambia, the information about DDs in level 1 hospitals is scarce as children who are suspected to have DDs are referred to referral hospitals for diagnosis. For instance, from January to November 2020 the neuro-clinic at the nation's referral hospital had 121 visits by unwell children under the age of five years (University Teaching Hospital (UTH), Children's Hospital Records, 2020).

According to Shakespeare and Officer (2011) and UNICEF (2013), in some countries, people with disabilities do not access services for the disabled people, have less education, and employment opportunities among others. Furthermore, UNICEF (2013) revealed that in many countries information about the number of disabled children and the types of their disabilities is lacking, and as a result, such children do not access the appropriate public amenities. For instance, Ruparelia *et al.*, (2016) reported that in Africa children with autism spectrum disorder seek medical services later compared to their counterparts from the developed world and that there is a possibility that many children are not identified and or are identified but do not receive support services due to perceived stigma concerning autism spectrum disorder, DDs and the belief that these DDs do not require medical intervention. Equally, Scherzer *et al.* (2012) disclosed that in developing countries, very little attention is paid to children surviving with DDs and consequently argued that incorporating early screening and intervention programmes into routine care for children can improve the quality of care given to them.

The increased interest in child disability demands for screening for cognitive, language, sensory, and motor development of younger children in under developed countries since they are more at risk of developing the disabilities (Bornstein & Hendricks, 2013; Matafwali & Serpell, 2014). Bornstein and Hendricks further stated that where disability would have already occurred, early diagnosis and intervention could prevent devastating results of disabilities. Similarly, Biasini *et al.* (2015) testified that continuous screening of child development can aid in early identification of risks for DDs and subsequent provision of appropriate intervention to improve quality of life.

WHO (2015), supports the argument by stating that the ability of children to attain their life perspective is a health issue because disabled people have difficulties accessing health services; a human right matter since disabled children face discrimination, stigmatised and their rights are violated; and a developmental concern as disabled people may be at risk of poverty due to lack of education and employment. To this effect, WHO (2015) concludes by stating that to promote good health and human right compliance, there must be an emphasis on primary health care as the vehicle for the prevention of risk factors for DDs. Therefore, screening for DDs in children under the age of five years is fundamental as it targets all children, though there is limited information about the clinicians' knowledge to screen children for DDs in under-five years children.

In Zambia, there have been misconceptions and myths surrounding DDs and these can hinder some parents or caretakers to disclose the child's DDs even to clinicians (Ministry of Community Development, Mother and Child Health (MCDMCH), 2015). Nonetheless, the Zambian government has a vision that by the year 2030 persons with

disabilities should enjoy opportunities that are essential to living and development (MCDMCH, 2015). Screening for DDs can be conducted by clinicians as they monitor the children's development for a long period (Aly et al., 2009; Ertem & WHO, 2012). Furthermore, clinicians are well-positioned to screen children for DDs as they are normally the sole providers of services to young children and are trusted by their communities (Ertem & WHO, 2012). However, there is no information about the clinicians' capacity to screen for DDs in children under five years of age in Lusaka. Therefore, this study was set out to assess the knowledge of clinicians to screen children under the age of five years for developmental disabilities at two selected hospitals in Lusaka District, Zambia.

1.3 Problem Statement

Developmental disabilities are one of the common disabilities among children (WHO, 2015). Eighty per cent of the children with disabilities live in developing countries (Gladstone et al, 2010). In Zambia, childhood disability accounts for 1.6 per cent of the population (Banda & Kalaluka, 2014) and the prevalence of risk factors for developmental disability is multiple. For instance, from January to November 2020 the Neuro-clinic at the nation's referral hospital had 121 visits by un-well children under the age of five years (University Teaching Hospital (UTH), Children's Hospital Records, 2020). Furthermore, communities are also not well sensitised about DDs (Shakespeare & Officer, 2011) while some misconceptions about DDs may hinder some parents or caretakers to disclose the noted child's DDs even to clinicians (MCDMCH, 2015).

People with disabilities experience more socioeconomic problems and poverty compared to their colleagues with no disabilities (Shakespeare & Officer, 2011: UNICEF, 2013). Unfortunately, many countries have scarce information about children with disabilities, consequently, such children do not access public services designed for disabled people (UNICEF, 2013). The Zambian government's vision for the year 2030 is to enable people with disabilities to have opportunities to have essential living and developmental standards. Clinicians who constantly provide health services to children under the age of five years can be the right people to screen for DDs in the children so that early diagnosis and institution of interventions to alleviate disabilities in children are commenced. However, there is scarce information about clinicians' knowledge to screen DDs in children under the age of five years in lower levels of health facilities.

1.4 Study objectives

1.4.1 Broad Objective

To assess clinicians' knowledge to screen development disabilities in children under the age of five years from two selected hospitals in Lusaka, Zambia.

1.4.2. Specific objectives

1. To establish clinicians' awareness of children under the age of five years at risks of having DDs;
2. To determine clinicians' knowledge to use the WHO Ten Question (TQ)to screen DDs in children under the age of five years; and
3. To determine clinicians' demographic characteristics that may influence knowledge in using the screening instrument.

1.5 Justification of the Study

Disability is a lifelong condition that hinders the affected person from attaining their life potential if the condition is not well managed. Screening for DDs in children can result in early identification and provision of appropriate services for rehabilitation which can enable children to achieve full life prospective as disabilities can be relieved. The clinicians' knowledge to screen DDs in children under the age of five years is important for the improvement of care given to children. The improved care provision can consequently improve the affected children's development by preventing DDs. The study result has the potential to add to the knowledge of what exactly happens on the ground and improve on the clinicians' practice. The result of the study may also be a reference in the formulation of the clinicians' curricula, and protocols and guidelines about service provision to children. Additionally, the study serves as a foundation for further research in the field of screening DDs in children under the age of five years.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter reviewed the relevant literature on the research topic to establish a comprehensive understanding of the topic. In the current study, a narrative review of the literature was performed: literature from global, regional and local studies was analysed and summarised to explain risks of children having disabilities, clinicians' knowledge to use the ten-question questionnaire instrument for screening DDs in children under the age of five years, and variables that could influence knowledge in using the screening instrument.

Literature search was conducted electronically by using PubMed open access, Google Scholar, Google and by the use of hard copies. Words such as risks for developmental disabilities, knowledge to screening developmental disabilities, and use of standard screening instruments, equipment or tools for screening for developmental disabilities in children under the age of five years by clinicians were variously combined to search for literature. The search was further guided by focusing on articles published ten years ago and earlier so that only recent articles were used as recommended by the college. Only a few old publications were used due to their importance. Literature review dealt with articles in English. Boolean words were also used.

2.1 Clinicians' awareness of children under the age of five years at risks of having DDs

Clinicians' awareness of the risks of children under the age of five years at risk of having DDs can aid in the comprehensive screening of the under-five children by the clinicians during service delivery (Patel et al., 2011). Awareness of risks for children under the age of five years to have DDs can offer more probabilities to capture children with mild and moderate DDs by clinicians since clinicians are frontline service providers for children (Urkin, Bar-David, & Porter, 2015). Therefore, children whose parents or guardians may not review children's condition due to misconceptions and myths surrounding DDs (Ministry of Community Development, Mother and Child Health (MCDMCH), 2015) can be followed up and be screened routinely. Some of the children who are at risk of DDs and require long term screening are premature or low birth weight or small for dates children, and children with neonatal encephalopathy, children with ill health, and those exposed to chemicals among others (Doyle et al., 2014).

2.1.1 Prematurity/Low birth weight/Small for small for gestation age and children with neonatal encephalopathy

A global systematic study and meta-analysis conducted to evaluate the long-standing damage of the central nervous system (CNS) of the preterm children highlighted that about 2.7 percent out of the thirteen million preterm children born in the year 2012, who lived above one month were found to have moderate to severe DDs while about 4.4 per cent were reported to have mild DDs (Blencowe et al., 2013). In addition, Blencowe *et al.* (2013) specified that prematurity accounts for 3.1 per cent of the entire world population and concluded by stating that improving care to surviving preterm

children can prevent DDs, especially in developing countries. Still at the global level, a report by Orchinik *et al*. (2011) in their study to investigate the consequences of utmost prematurity (gestational age < 28 weeks)/utmost low birth weight (weight < 1000g) on intellectual ability highlighted that the rate of cognitive discrepancies in utmost low preterm or low birth weight children was three to six times higher than in children delivered at term. Orchinik *et al.* (2011), further highlighted that shortfalls in decision making and motor skills were reported despite regulating the learnt verbal information. The study concluded by indicating that effort to identify such children early and applying intervention measures was required (Orchinik et al., 2011). The findings support the idea that clinicians need to be aware that prematurity or /low birth weight or small for dates risk children for DDs.

Similarly, an Arabian study that investigated the impact of various neonatal risk factors on language and mental abilities, and which risk factors (including prematurity and neonatal encephalopathy) posed more risk for DDs in children, revealed that premature children were almost four times at risk of developing DDs than term children (Abou-Elsaad et al., 2017). These findings also show that preterm children and children who suffer from encephalopathy are at risk of DDs. Therefore, clinicians need to be aware that such children are at risk of having DDs so that they can screen them appropriately.

In the sub-Saharan region, a study of seventy-three late preterm children with mean gestation of thirty-three weeks and mean birth weight of 1.9 kg conducted in South Africa to determine the outcome of preterm children in relation to intellectual, language and motor abilities discovered that there was no difference in the development of intellectual, language and motor abilities between the preterm and the full-term children

(Ramdin et al., 2018). However, Ramdin *et al.* (2018) further reported that four (7.1%) out of the fifty-six preterm children that were screened using a Bayley assessment instrument had DDs. The researchers concluded that preterm children risk having DDs and as such, they require continued screening. These findings support the argument that preterm children are at risk of having DDs. Hence clinicians should be aware that preterm children are at risk of DDs. In addition, a cohort study was done in Uganda, which aimed at showing the primary childhood outcome for neonatal encephalopathy survivors, found that DDs incidence in affected and non-affected children was at 58.6 per cent and 1.3per cent respectively (Tann et al., 2018). The findings show that prematurity and neonatal encephalopathy risked children to DDs. As such, clinicians need to be aware that premature children and children with encephalopathy needed long term follow up to screen for DDs.

Furthermore, a Zambian study that assessed the relationship between neonatal encephalopathy and neurodevelopment in eight months old children, disclosed that children who had encephalopathy developed motor and mental DDs (8 and 9 times respectively) more than the children who did not have encephalopathy (Chola, 2016).

2.1.2 Diseases

A global study conducted in 195 nations and regions to assess the incidence of disabilities as well as years lived with disabilities in children under five years of age, exposed that globally there was a reduction in several children with DDs due to disease (Olusanya et al., 2018). However, the study further reported that despite the decline in the number of children with DDs in many countries, the figures of children with DDs in sub-Saharan Africa is still high (71.3%) due to little attention paid to children who survive childhood illness Olusanya *et al.* (2018). Furthermore, a systemic and mate

analysis study conducted by Pierce *et al.* (2020) showed that children with parents who have mental disorders have physical health risks. Nevertheless, awareness of the physical health risks for such children is important to improving the children's lives (Pierce et al., 2020). The findings demonstrate that clinician's awareness of the disease as a risk for children under five years of age to have DDs can help in providing the required care.

Additionally, a regional study conducted in South Africa to establish the incidence and magnitude of DDs in children with Human Immunodeficiency Virus (HIV) by Potterton *et al.* (2009) found that out of the 122 children who were followed eighty-eight had their motor progress affected while sixty-three of the children had their intellectual development affected. In addition, the study showed that these children were also malnourished and their growth was stunted. Similarly, Abessa *et al.* (2017) in an Ethiopian study that studied the effects of severe malnutrition in children under six years of age, revealed that children who suffer from malnutrition subsequently suffer DDs such as gross motor skills, fine motor skills, social-emotional skills and language disabilities. Nonetheless, the prevalence of DDs in this age group of children is higher in those children that suffer from malnutrition in the infancy stage (Abessa et al., 2017). The above literature supports the suggestion that disease risks children under five years of age have DDs.

Furthermore, another South African study conducted to evaluate physicians' capacity to screen for DDs in HIV positive children compared to the HIV negative children using the WHO Ten-questions disability screening tool disclosed that most (59.3%) of HIV positive children had DDs compared to the HIV negative children had (42.8%) (Knox

et al., 2018). Correspondingly, Banks et al.(2017) in the Zimbabwean study that investigated awareness of HIV associated disabilities among the nations' stakeholders in HIV and AIDS and/or disability revealed that there are many HIV associated disabilities in sub-Saharan Africa where HIV is endemic. As survivors live longer it is important to integrate measures to curb the vice at a local level where HIV survivor are attended to (Banks et al., 2017). The findings substantiate the claim that disease puts children at risk of having DDs. Therefore, clinicians' awareness of under-five children at risk of DDs will aid in the continuous screening of such children for DDs.

Similarly, Gompels *et al.* (2012) in their cohort study, conducted in Zambia, concerning the outcome of human cytomegalovirus (HCTMV) infection in relation to growth, development as well as the health of HIV exposed children and non-exposed children, disclosed that the entire population of infants, who were HCTMV seropositive, had stunted growth by the age of eighteen months compared to their counterparts (standard deviation -0.44). In addition, HIV exposed infants who were also HCTMV seropositive and had reduced mental and motor development (Barley test score difference of -4.1 which was significant compared with the HIV non-exposed infants (Gompels et al., 2012). Since substances such as micronutrients were reported to have no negative effect, the findings confirm that disease posed a risk for children under five years of age to DDs. Therefore, the above finding further supports the claim that clinicians should be aware that disease can cause DDs.

2.1.3 Exposure to chemicals

A cohort study, done among Hong Kong children, to evaluate whether there is any relationship between prenatal exposure to a low dose of mercury and the mental development of children, exposed that there was a relationship between preconception

exposure to mercury and mental development of the children and the negative effects increased according to the increase in exposure (Lam et al., 2013). After removing confounders such as age and sex in the 608 participants, the study showed that the affected children had a reduced intelligence coefficient of -0.944 which was significant, and the Hong Kong List Learning Test showed the short and long recall deference (coefficient of -1.087 and coefficient of -1.161) and both were significant (Lam et al., 2013. This suggested that exposure to a chemical risked children under five years of age having DDs.

In another study, conducted in South Africa, to evaluate the effect of maternal exposure to chemicals (dichlorodiphenyltrichloroethane and pyrethroids) in the preconception period and the development of young children established that exposure to dichlorodiphenyltrichloroethane did not negatively affect children (Eskenazi et al., 2018). Nevertheless, the study also discovered that each ten times increase in some chemicals such as 3-phenoxybenzoic acid was associated with low (-0.58) psychosocial behaviour at twelve months and that maternal exposure to chemicals such as pyrethroids prior to conception resulted in language composition and written DDs (Eskenazi et al., 2018). These findings further validate the view that exposure to a chemical risked children under five years of age have DDs.

Furthermore, a study conducted in Zambia to learn the relationship between current exposure to Dichlorodiphenyltrichloroethane(DDT), socio-economic factors, as well as the neurodevelopmental effect in children using the Ages and Stages instrument outlined that exposure to DDT caused moderate fine motor DDs which needed to be further screened (Munyinda et al., 2018). In addition, Munyinda *et al.* (2018) reported

that the child's age of exposure to chemicals showed a bearing on the effect of the fine motor DDs. Likewise, a study that sought to assess the pertinent published information about the effects of air pollution due to mining activities that affect people, animals, plants as well as structures, and to analyse the researchers' opinions and possible further study, discovered that air pollution levels in some mining areas were beyond both the national and the international standards of safe limits (Mwaanga et al., 2019). The study also showed that children had uncontrolled lead poisoning (Mwaanga et al., 2019). This indicated that the health of children was at risk and further confirming that children exposed to chemicals risk having DDs. Similarly, MCDMCH (2015) stated that lead pollution causes intellectual disability, particularly in children. Therefore, clinicians should be aware of children under five years of age who are exposed to the chemicals which may cause DDs in them so that they can follow them and screen them regularly.

2.2 Clinicians' knowledge to use the WHO Ten-questions disability screening instrument to screen DDs in under-five children

Clinical guidance instruments lead to standardised screening, and consequently, healthcare provision improves (Sutcliffe et al., 2016). Therefore, clinicians need to have the knowledge to use the available screening instruments for them to be able to appropriately screen children for DDs. A systematic review of literature, which involved identifying the possibility of using developmental screening and monitoring tools for children from birth to three years by unspecialised primary health professionals in developing countries, found that out of the fourteen tools which were used in the under developed countries, only three were suitable for screening DDs in children at primary healthcare stage (Fischer, Morris, & Martines, 2014). The study results show that clinicians should have knowledge for them to effectively screen

children appropriately for DDs as screening is required to be done even at the primary healthcare level and by unspecialised health care providers. Correspondingly, a Malaysian study that assessed the undergraduates' curricula, and their view about screening for DDs as well as managing children with DDs reported deficits and irregularity in the curricula, and incompetence as well as lack of confidence about screening and handling individuals with DDs among the 230 newly qualified health professionals (Moyle, Iacono, & Liddell, 2010). In summary, Moyle, Iacono & Liddell (2010) pointed out that the curricula for students should be reliable, and during training, students should be rotated to areas where they can gain the ability to screen for DDs. The findings support the idea that knowledge about the use of available instruments for screening for DDs is necessary for clinicians to adequately screen children for DDs.

Still, at the global level, a Canadian study which described challenges faced by Clinical Nurse Specialists (CNSs) in executing their role, and explores how CNSs describe the skills and qualities that are needed to promote the use of the evidence-based practice in their workplaces, exposed that clinicians had the knowledge needed and can be able to screen for DDs if their role is clearly outlined (Campbell & Profetto-McGrath, 2013). The findings show that clinicians need knowledge to effectively carry out their roles.

In sub-Saharan Africa, a South African study that assessed the capability of clinicians to detect DDs in HIV positive children, as well as in HIV negative children, exposed that doctors were able to detect more gross motor and language disability in HIV positive children than in HIV negative children (Knox et al., 2018). The independent psychosocial screening showed that HIV positive children were more at risk of

cognitive disorder as well as language disorder respectively compared to their HIV negative counterparts (Knox et al., 2018).

The study results support the suggestion that clinicians require knowledge to use the instrument to be able to screen children for DDs. In line with that, a study was done in Ethiopia to assess educational requirements, and the perception of community healthcare providers concerning offering child mental health services reported that sixty-six out of the ninety-three participants expected to have improved knowledge and screening methods (52 and 14 respectively) (Tilahun et al., 2017). Tilahum *et al.* (2017), further revealed that addressing challenges faced by community healthcare providers can improve health service provision to children. The findings further support the argument that clinicians require knowledge in the use of available method to screen children for DDs.

Additionally, a Zambian study conducted to investigate the clinicians' view regarding the integration of mental health services into primary health care, discovered that clinicians were willing to integrate the mental health services into primary health care (Mwape et al., 2010). Nonetheless, Mwape *et al.* (2010) indicated that the clinicians suggested that they needed basic training to update their knowledge. In summary, the researchers recommended that clinicians should be provided with basic training in mental health to improve their knowledge. These study findings also support the idea that clinicians need knowledge for them to use the recommended screening instruments appropriately.

Furthermore, another Zambian study conducted to evaluate the result of HCTMV infection concerning growth, development as well as the health of HIV maternally exposed children, and the non-exposed HIV exposed infant using Barley testing instrument highlighted that HCTMV seropositive children had low mental and motor development compared to control group (Gompels et al., 2012). The findings supplement the suggestion that clinicians need to have the knowledge to use available instruments to screen children for DDs.

2.3 Factors among Variables That May Influence Clinicians' Knowledge to Use the Screening Instrument

A systemic review which aimed at finding out the possibility of using standardised screening and monitoring instruments for children by unspecialised clinicians in developing countries discovered that there are instruments that are suitable to use to screen DDs in children in the developing countries (Fischer, Morris & Martines, 2014). The findings compliment the suggestion to find out factors that may influence clinicians' knowledge to use the screening instrument.

2.3.1Clinicians' age

A review study, conducted to examine the impact of age of physicians on the health profession, reported that fear of losing competent physicians and risk of having deficiency of physicians has led older physicians to continue with clinical service delivery in the United States of America. However, the researchers also reported that there was evidence that intellectual ability reduced on average by more than 20 per cent between the ages of forty years to seventy years although this may vary from person to person (Dellinger et al., 2017). Similarly, another United States of America study that

examined the outcome of admitted patients treated by either the younger or the older physicians reported that apart from patients who were treated by younger physicians in large numbers, the younger physicians outperformed the older physicians (Tsugawa et al., 2017). Literature from the previous findings supports the suggestion that clinicians' age may influence clinicians' knowledge to use the developmental screening instruments.

In another development, a Nigerian study that sought to understand socio-demographic characteristics that influenced physicians' patient-centred care in the nation's four selected hospitals, revealed that physicians who were more or equal to thirty years old provided more patient-centred care compared to their counterparts who were equal or less than thirty years old (Abiola et al., 2014). Similarly, a Sudanese study that investigated job consummation amongst physicians working at national hospitals reported that age influenced job fulfilment and factors such as deficiency of training, workload and work settings, among others, negatively influenced physicians' health care delivery (Suliman et al., 2017). The findings further support the suggestion that clinicians' age may influence clinicians' knowledge to use developmental screening instruments.

However, a South African study that investigated the clinicians' understanding, practice, as well as opinions concerning hearing disability in new born children, disclosed that above one-third of the seventy-five nurses who participated in the study had at no time screened a child for hearing DDs (Khan et al., 2018). Khan *et al*. (2018) also revealed that nurses were not well equipped with instruments for screening children for DDs. For instance, only slightly above a third (31%) of the seventy-five

nurses who participated in the study utilised the Road to Health Developmental screening instrument to screen hearing DDs in children. Similarly, a study conducted to find out challenges to enforce developmental screening in the urban primary healthcare paediatric facilities, reported that physicians favoured clinical judgement to using screening instruments, they did not have time to screen children for DDs and they did not have training in developmental screening (Morelli et al., 2014). In conclusion, Morelli *et al.* (2014) stated that there was a need to provide training to all physicians to enable them to conduct developmental screening in children while Khan *et al.,* (2018) emphasised the need to empower nurses to enable them to screen for DDs in children. The findings dispute the proposition that clinicians' age may influence knowledge to use the developmental screening instruments.

Similarly, a Zambian study aimed at exploring health care providers' perceptions towards individuals with cognitive disabilities and the likely cause of such behaviour, showed that there was stigmatisation and discrimination of people with cognitive disabilities by clinicians because clinicians lacked awareness of cognitive disorders (Kapungwe et al., 2011). In conclusion, Kapungwe *et al.* (2011) disclosed that there was a serious need to train clinicians to identify and manage individuals with cognitive disabilities. The study findings further disputed the claim that clinicians' age may not influence clinicians' knowledge to use a DDs screening instrument. Therefore, it is important to note that although age has shown that it may influence clinicians' knowledge to care for patients, care should be taken to rule out challenges that may influence or hinder knowledge.

2.3.2 Clinicians' gender

A study that aimed at investigating problems to developmental screening, as well as procedures for screening in the urban paediatric areas, reported that physicians liked using clinical judgement than using screening instruments and that physicians did not have the time and training required to screen for DDs (Morelli et al., 2014). In line with their findings, Morelli *et al.* (2014) argued that physicians needed training and time for them to be able to conduct developmental screening. Likewise, a systemic review designed to investigate training needs for health care providers working with people with disabilities, discovered that all clinicians lacked the knowledge required for the provision of quality health services to disabled people (Hemm et al., 2015).

Hemm *et al.* (2015), further reported that the main training plan for all professionals was needed. The findings do not support the argument that clinicians' gender may not influence clinician's knowledge to use the DDs screening instruments.

Similarly, a study conducted in South Africa to evaluate physicians' capacity to screen DDs amongst HIV negative and HIV positive children did not find gender to influence clinicians' knowledge to use the screening instrument**.** Nevertheless, a Tanzanian study that investigated factors that influence nurses' service delivery in clinical areas, reported an association between gender and service delivery (Gemuhay et al., 2019a). According to Gemuhay *et al.* (2019), male nurses' knowledge in clinical practice was negatively affected by work situation, whereas the female nurses' knowledge in clinical practice was negatively affected due to their nervous state. However, measures such as orientating nurses to the clinical setting and practice, regular supervision and modifying practice according to gender may improve clinicians' knowledge in clinical practice

(Gemuhay et al., 2019a). The report supports the argument that gender may influence clinicians' knowledge to screen DDs in children.

On the other hand, in Zambia, a study conducted from two settings to examine clinicians' view of integrating mental health services into primary health services to improve identification of mental disability, showed goodwill from clinicians (Mwape et al., 2010). Nevertheless, the clinicians indicated that they needed the training to enhance their knowledge (Mwape et al., 2010). The findings do not support the suggestion that gender influences knowledge to screen DDs in children.

2.3.3 Clinicians' Profession

A Canadian study that investigated constraints clinical nurse specialists faced regarding their role, and examined factors required to enhance the use of the evidence-based practice in the nurse specialists' clinical practice setting reported that clinicians' line of service delivery was not well defined, clinicians were role stressed, and they had no support and resources required to implement evidence-based practice (Campbell & Profetto-McGrath,2013). Campbell and Profetto-McGrath (2103), concluded by stating that the clinicians' role needed to be reinforced by standardising the regulatory measures. Similarly, a study conducted in the United States of America to assess the effect of inter-professional edification among student nurses and occupational therapy students, and to encourage teamwork, disclosed that students' knowledge of procedures performed by the other professionals increased as they worked together (Zamjahn et al., 2018). The findings suggest that the clinician' profession may influence the clinician's knowledge to use the DDs screening instruments.

Furthermore, clinicians' delivery of quality healthcare services is enhanced by staff values, inspiration, behaviour and their relationship with the patients (Farr & Cressey, 2015). A Cochrane review of primary healthcare services, delivered by nurses compared to that delivered by physicians, highlighted that for some patients' conditions nurses provided similar or better healthcare service than frontline physicians (Laurant et al., 2018). In line with that, a study conducted to examine clinicians' attitude concerning uniform screening and worthiness of diagnosis in planning management, revealed that generally, clinicians were willing to use standardised screening instruments (Danielson et al, 2019). Nevertheless, Danielson *et al.* (2019) were quick to highlight that clinicians needed to be trained for them to adequately use the available instruments. The findings further added to the argument that clinicians' profession may influence clinician's knowledge to use DDs screening instruments.

Similarly, a sub-Saharan African project conducted in five different countries, that aimed to close the gap between knowledge and quality healthcare service provision, highlighted that mentorship and teaching services improved clinicians' clinical care and decision making (Manzi et al., 2017). In another development, a study done in Nigeria to investigate medical students' knowledge, attitude and perceptions about epilepsy reported that clinical students were more knowledgeable about epilepsy than medical students (Ekeh & Ekrikpo, 2015). Clinical students' exposure to epilepsy may have improved their knowledge about the condition (Ekeh & Ekrikpo, 2015). The findings further affirm the suggestion that the clinicians' profession may influence clinician's knowledge to use DDs screening instruments.

In line with the foregoing discussion, a Zambian study revealed that nurses and clinical officers were trained to offer basic health service delivery (Makasa et al., 2015). Physicians were trained to offer holistic practical and preventive health services and they were to oversee other clinicians in health institutions (Makasa et al., 2015). The report further strengthens the proposition that profession may influence knowledge to screen DDs in children.

2.3.4 Clinicians' institution

A Californian study that assessed autism spectrum disorder, developmental screening, frontline paediatricians' perceptions to screen Latino children, as well as barriers to screening Latino children, revealed that even though 217 (81%) of the clinicians conducted developmental screening, only twenty-seven (10%) of the clinicians provided screening according to American Academy guideline for screening children for DDs (Zuckerman et al., 2013). According to Zuckerman *et al.* (2013), language and culturally appropriate developmental screening instruments, enlightening clinicians, and supporting them during screening can improve practice. This indicates that the clinicians' institution may influence the clinicians' knowledge to use DD screening instruments.

A situational review conducted in some African countries (Kenya, Nigeria, South Africa and Uganda), intending to review the training and curricula for clinicians to substantiate area for improvement, reported that there was a gap both in training programmes and in the training process (Couper et al., 2018). Couper *et al*. (2018), further reported that only South Africa had a recent source of training curricula and training methods. In conclusion, Couper *et al.* (2018) highlighted that to promote quality healthcare provision training curricula and training methods should meet

international levels while addressing the local disease burden. Similarly, a South African study that sought to discover and describe nurses' working experience with a critical shortage of medical equipment discovered that lack of medical instruments negatively affected nurses and the health facility's healthcare provision (Moyimane et al., 2017). Medical equipment is important in patient or client management (Moyimane et al., 2017). The findings support the argument that the clinicians' institution may influence clinicians' knowledge to use DDs screening instruments.

In Zambia, a study that assessed socioeconomic disparities or inequity in government health facilities reported concentration indices for government-owned health facilities of -0.28 and -0.09 for visited health post and health clinic respectively (Phiri & Ataguba, 2014). This caused disparities in healthcare provision (Phiri & Ataguba, 2014). The findings support the proposition that clinicians' institution may influence clinician's knowledge to use DDs screening instrument.

2.3.5. Duration of service

At the global level, a study that explored how clinicians understood and assessed their performance and quality of their healthcare services delivery discovered that quality healthcare provision by staff depended on clinician's principles, drive and behaviour, as well as their relationship with the patients (Farr & Cressey, 2015). However, a Malaysian study that sought to understand the curricula content for the undergraduate and their experience with DDs, received during training, as well as their role in screening for DDs, reported gaps in both the content and consistency of the curricula. The study further reviewed that newly qualified physicians lacked certainty about their role to screen for DDs (Moyle et al., 2010). Similarly, a review study done in the United

States of America, that pursued understanding whether clinicians' duration of service was related to patient outcome, reported that physicians with long duration of service did not use guidelines when caring for patients. The study also reported that patients who were taken care of by the physicians with a long duration of service had an increased risk of longer duration of hospitalisation and mortality rate (Southern et al., 2011). In conclusion, the study reported that care should be taken to maintain physicians' clinical practice (Southern et al., 2011), signifying that if care is not taken physicians lose knowledge to manage patients or clients well. Therefore, the above literature supports the claim that duration of service may influence clinicians' knowledge to use screening instrument.

Additionally, a study done in Nigeria to learn medical students' knowledge, attitude as well as awareness about epilepsy, reported that compared to medical students, clinical students were more knowledgeable about epilepsy (Ekeh & Ekrikpo, 2015). Ekeh and Ekrikpo (2015), also stated that clinical students' exposure to epilepsy may have improved their knowledge about the condition. Correspondingly, another Nigerian study that sought to understand socio-demographic characteristics that influenced physicians' patient-centred care in four selected hospitals in Nigerian, revealed that physicians who had served equal or more than six years provided more patient-centred care compared to their counterparts who had served fewer years. The findings are in line with the suggestion that clinician's duration of service may influence their knowledge to use available screening instruments.

However, a Rwandan study which investigated clinical mentorship and quality enhancement programme to support nurses, revealed that nurses that received

mentorship adhered to treatment guidelines due to knowledge gained (Ndayisaba et al., 2017). The findings are suggestive that training received may influence clinician's knowledge to use disability screening instruments, provided that their duration of service may influence their knowledge to use screening instruments.

In Zambia, a study by Kapungwe *et al.* (2011) that aimed at exploring clinicians' point of view, regarding individuals with cognitive disabilities and the likely cause of such perception, pointed out that there were stigmatisation and discrimination of people with cognitive disabilities. In conclusion, Kapungwe *et al.* (2011) stated that clinicians lacked awareness of mental conditions and as such there was a serious need to train clinicians to identify and manage individuals with cognitive disabilities. The literature signifies that duration of service may not influence clinicians' knowledge to use DDs screening instruments used when screening DDs in children.

2.4 Conclusion

Literature review showed that developmental disabilities are common among children especially in low- and middle-income countries where there are so many risk conditions such as prematurity or low birth weight or small for dates, diseases, chemical exposure and genetic disorders (Doyle et al., 2014). It also showed that clinicians' awareness of children at risks of having DDs can aid in close monitoring and screening of such children for DDs (Urkin, Bar-David, & Porter, 2015) and that clinicians also need the knowledge to use available instruments for screening children for DDs so that they can capture children with disabilities during their routine service delivery**.**

The literature further revealed that teamwork improves inter-professional knowledge, implying that clinicians should be able to use and interpret instruments used at the community level, and if they are not knowledgeable in the use of screening instruments by working with clinicians who know how to use the available screening instruments, they can gain knowledge.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter considers the methodology employed to conduct the study. It comprises the study design; study setting; study population; sample size; sampling method and eligibility criteria for participants. It also includes data collection instruments; pretesting of the data collection instrument; validity and reliability; ethical consideration; data collection process as well as data management and analysis.

3.2 Study Design

This study used an ontologic stance of objective reality as well as an epistemological stance of empiricism. The objective realistic ontology argues that reality exists, there is a real-world determined by real natural causes whereas empiricism as an epistemological stance claims that knowledge comes through accurate research based on direct knowledge gathered through the senses (Bryman, 2012). These ontological and epistemological assumptions guided the conduct of this study. A quantitative methodology was appropriate because a quantitative methodology allows rigorous measurement, comparison, statistical aggregation of data and generalizability (Patton 2002). Therefore, a quantitative cross-sectional design was used to assess the knowledge of clinicians from two selected first-level hospitals in Lusaka, to screen children under the age of five years for DDs.

Furthermore, this method was suitable because the researcher wanted to establish the picture of the occurrence by investigating the situation using data collected from participants on time (LoBiondo-Wood & Haber, 2013). This type of research design also aided in controlling or avoiding bias by having strict sample characteristics for participants and yielded a base for practice because it represented the best for clinical practice (LoBiondo-Wood & Haber, 2013). The method helped to provide a picture of the actual phenomenon.

3.3 Study Setting

Two study sites were used to obtain a variety of participants and to improve the study result. The study settings were selected using the multiple-stage sampling method as highlighted by Polit and Beck (2017). All the five-level One public hospitals and the military hospital in Lusaka District were listed. Considering that none of the hospitals had a record of children with DDs, then two hospitals were randomly selected using the strata method (Polit & Beck, 2017) based period of establishment, the distance between the hospitals and ownership of the facility.

The hospitals selected, as study settings, were Maina Soko Military Hospital and Matero Level One Hospital, the latter being the first Level One hospital to be established, and was furthest from the military hospital.

At the health facilities, the study setting was randomly chosen based on the services offered. All areas where child health services were offered were selected for the study. These were the Outpatient department, Well-child clinic, and Paediatric ward at the two selected hospitals. Data were collected in November 2019.

3.4 Study population

The study population was all clinicians working at the Out-patient Department, Well-child clinic, and Paediatric ward for Maina Soko Military Hospital and Matero Level One Hospital.

3.5 Sample size

The sample size of the clinicians to participate in the research was calculated using a formula by Taro Yamane 1 because there was a finite population (Singh & Masuku, 2014). This method was used to determine the sample size because the population was known. The formula is as follows: $n=N/1+Ne^2$, where n is the sample size, N is the known population and e is the acceptable error. Therefore, the population for two hospitals was added to calculate the sample as follows:

$$32+75 = 107$$

$$N = 107/1+107(0.05)^2$$

$$= 107/1+107(0.0025)$$

$$= 107/1+0.27$$

$$= 84.25$$

$$85$$

However, since the number of clinicians from the two hospitals was low, all available clinicians during data collection were involved in the study.

3.6 Eligibility criteria

The eligibility criteria for the study were all clinicians who were currently working in the Out-patient Department, Well-child clinic, and Paediatric ward for Maina Soko Military Hospital and Matero Level One Hospital because these were the people who regularly attended to children. At each health facility, the researcher explained the study to the Nursing Officers in-charge of the health facility and the participants. Thereafter, the Nursing Officers in-charge handed over the participants to the researcher for the interviews to commence.

3.7 Sampling Method

Simple random sampling was used to select hospitals since they were not too many hospitals to conduct cluster sampling (Polit & Beck, 2017). The hospitals were listed according to the type of administration (public hospitals and Military hospital) and level of health facility, and then randomly selected according to regions and time of establishment. The furthest public hospital, from the only military hospital, and the first Level One Hospital to be established was randomly selected. Participants for this study were recruited using the census sampling method (Polit & Beck, 2017) since the total number of clinicians (physicians, nurses and clinical officers(Vasan et al., 2009) and midwives) from the selected hospitals were manageable.

3.8 Recruitment of participants

In this study, every clinician who was eligible and was on duty during the study period was given an equal opportunity to participate in the study as this also promoted representation of the study population (Polit & Beck, 2017). The researcher verified with the administration staff on which clinicians were working in the Out-patient

Department, Well-child clinic, and Paediatric ward at Maina Soko Military Hospital and Matero Level One Hospital and explained the aim of the study to the clinicians, highlighted the benefits of the study and informed the clinicians that participation was not mandatory. The researcher also informed the clinicians that refusal to participate in the research would not affect their job in any way. The researcher then invited the clinicians to participate in the study if they chose to. All clinicians, who were available at the time of the research, opted in and participated in the study fully except for one who was busy and could not give an appointment for a later date.

3.9 Data Collection Instrument

Likert scale questionnaire was used to collect information about clinicians' ability to identify children at risks of having DDs in under-five children and to determine clinicians' knowledge for screening DDs in children under the age of five years. Several declarative items, which expressed the perspective on a topic, were provided and respondents were asked to indicate their opinion concerning the statement given. The study responses were strongly agreed, agree, disagree, and strongly disagree (Polit & Beck, 2017). One mark was allocated for an answer strongly agree, for positively a constructed question and a mark for an answer strongly disagree for a negatively constructed question while zero marks were allocated for other options.

The data collection instrument had three sections which comprised of demographic characteristics (address, gender, age, profession, and duration in service), clinicians' awareness of children under the age of five years at risks of having DDs, and clinicians' knowledge to screen DDs in under-five years children. To establish clinicians' awareness of children under five years at risk of having DDs, questions were formulated

by adapting the tool which was used to screen developmental difficulties in early childhood by Ertem and WHO (2012). All questions about awareness of risks, for children under the age of five years to have DDs when checked using Cronbach's alpha test, scored above 0.7 which showed good internal reliability (LoBiondo-Wood & Haber, 2013).

Similarly, to determine clinicians' knowledge for screening DDs in under-five years children, the researcher adapted questions 301-302 from Ertem and WHO (2012) and questions 303-314 from the WHO Ten-questions disability screening checklist (UNICEF, 2008; Knox *et al.,* 2018). All questions about clinicians' knowledge to screen DDs in under-five children when checked using Cronbach's alpha test scored above 0.8 signifying that the questions were reliable (LoBiondo-Wood & Haber, 2013).To avoid creating bias, some items on the Likert scale questionnaire were worded positively while others were worded negatively so that the responses could not have a trend to strongly agree, agree, disagree or strongly disagree. All participants responded to the questionnaire individually in a private in the presence of the researcher to provide clarity where necessary.

For grading the outcome of the interview, a cut-off point of 50 per cent, as used by Ahlgren *et al.* (2017) in their study conducted in Zambia, was adopted considering that all question had Cronbach's alpha test score of above 0.7 which showed that reliability was good. Any participant who scored below 50 per cent was regarded as not being aware of children under the age of five years at risk of having DDs, and or had no knowledge to screen DDs in children under the age of five years. Participants who scored above 50 per cent were considered to be aware of children at risk of DDS.

3.10 Pretesting

Pre-testing of the research study questionnaire was conducted to acquaint and establish hitches that could be corrected before the data collection was started. Pre-testing also helped to examine the accurateness and reliability of the data collection instrument. In this study, pre-testing of the questionnaire was done at Chilenje Level One Hospital, which was also one of the health facilities in the Lusaka district where paediatric services were offered. One participant from each of the three paediatric departments (Out-patient department, Well-child clinic, and Paediatric ward) was interviewed to represent clinicians from the areas where data was to be collected from at the selected institutions.

At each study setting, the sister in-charge introduced the researcher to his/her members of staff and explained the purpose of the visit. Since the study was to be conducted on all clinicians working with children, in each department a clinician who was not busy at the time the researcher went to the department was requested to remain in the staffroom to answer the questionnaire if he or she consented to take part in the study. The researcher explained to each clinician that he or she was being invited to participate in the study, that participation was voluntary, and that as a participant a clinician was free to withdraw at any time should one feel so. Prior to commencing the interview, privacy was guaranteed and each participant signed a consent (Annex 1 part II). Numbers were allocated to questionnaires to promote anonymity and the self-administered questionnaire was completed by each participant in a closed room in the presence of the researcher. At the end of the data collection, each participant was thanked and asked for any questions relating to the study. After pre-testing, a column

was added to indicate the response on demographic characteristic as well as inserting the word physician.

3.11 Validity and Reliability

External validity (LoBiondo-Wood & Haber, 2014) was enhanced by validating the representation of the study settings, which was representative of two different types of health service providers in Lusaka, Zambia. To investigate the effect of the independent or the dependent variables on the result, the research included all clinicians working in areas where paediatric services were offered, then excluded confounding factors such as work experience and social support by creating comparable groups (Polit & Beck, 2017).

Content validity was maintained by adopting a tool that has been validated and adopting some questions from tools that had already been accepted for use. Minimal changes to some questions were made to enhance the suitability of the questions for the current research. The tool systematically covered all the concepts, and the relevance of each concept to a specific dimension of the construct was ensured. The tool had a varied number of items representing the domains of the construct to ensure that the full content of the domain was captured. Completeness was ensured by consulting with experts on the topic of research to avoid missing the constructs. Questions were simple and specific, and the researcher only interviewed eight to twelve respondents per day. The tool was pretested before data collection to ensure that it would capture the desired information. To avoid the prejudice or selection bias of respondents, all the clinicians from the two hospitals were involved in the study.

The stability of the results obtained was ensured by adopting and adapting already validated tools as well as checking all questions for internal consistency. All questions about clinicians' awareness of children under the age of five years at risk of having DDs when checked using Cronbach's alpha test, scored above 0.7 which showed good internal reliability (LoBiondo-Wood & Haber, 2013). Similarly, all questions about clinicians' knowledge to screen DDs in under-five children when checked using Cronbach's alpha test scored above 0.8 signifying that the questions were reliable. Cronbach' alpha test was used because it is suitable for use in Likert type scale tools (LoBiondo-Wood& Haber, 2013).

Furthermore, the instrument was pre-tested for accuracy and clarity so that if there were any discrepancies on the tool they could be cleared before the commencement of data collection.

Regular cross-checking, as well as scrutinising of information on the data collection tool, was performed to safeguard relevance, accuracy, completeness, and consistency of the data collected.

3.12 Ethical Consideration

To safe guard human rights, ethical approval was sought from the College of Medicine Research Committee (COMREC) (reference number P.03/19/2634), and the University of Zambia Biomedical Research Ethics Committee (UNZA-BREC) (reference number 264-2019) (Polit & Beck, 2017). Further approval was sought from National Health Research Authority and permission to conduct the study was obtained from Lusaka District Health Office and the two selected hospitals. During the whole research period, dignity for human rights was to be upheld (Polit & Beck, 2017). Research objectives

were explained to participants before they were engaged so that at the time they were giving the informed consent they were aware of the programme (Polit & Beck, 2017). Participants were also informed that they were free to choose whether to participate or not and that they were free to withdraw at any point if they felt so (Polit & Beck, 2017). Furthermore, participants were assured that the study was risk-free physically and psychologically and that should any need arise counselling would be provided (Polit & Beck, 2017).

Prior to the commencement of data collection, written informed consent was obtained from respondents by signing an individual consent form (Polit & Beck, 2017). To promote anonymity and confidentiality, no name of the participant was written on the questionnaire and reporting of the research data was done by aggregating the responses to prevent linking data to specific participants (Polit & Beck, 2017). In addition, to further ensure confidentiality coding was done and interviews were conducted on a one-to-one basis in a closed room (Polit & Beck, 2017). At the end of the interview, each participant was asked if he or she had a question and was thanked (Polit & Beck, 2017).

3.13 Data Collection Process

The process of collecting required information to answer the research problem (Polit & Beck, 2017) was preceded by pretesting the data collection instrument to identify flaws and to have a better understanding of how the concepts in questions were conceptualised by respondents. Data collection was done entirely by the researcher. The researcher conducted individualised interviews within twenty to thirty minutes in a closed room to promote privacy. This was essential for the quality and accuracy of data. To promote anonymity, participants did not indicate their names on the

questionnaires but used serial numbers. Prior to the commencement of data collection, the researcher explained the aim of the study to the participants, the possible benefits of the study, and that participation was not compulsory (Annex 1 part I). Participants were informed that they were free to withdraw should they feel so at any time. They were also informed that participation was free**.** Data collection was done from all clinicians who met the eligibility criterion. Furthermore, privacy was guaranteed and each participant signed a consent (Annex 1 part II).

3 14 Data Management and analysis

The questionnaires were given code numbers to facilitate easy identification and sorting, and at the end of each day, the data collected were cross-checked for accuracy and completeness and computed to ensure correct record analysis. To safeguard the information, all completed questionnaires were put in an envelope which was then locked in a filing cabinet in the researcher's office.

All data from the questionnaires were entered into excel and analysed with Stata 13.1. Demographic characteristics (address, age, gender, profession, and years in service) were presented as numbers and percentages. Clinicians' awareness of children under the age of five year**s** at risks of having DDs and clinicians' knowledge to screen DDs in children under the age of five years were stated as medians and interquartile range as data was not normally distributed and both measures were not sensitive to very high and very low scores. Furthermore, to compare the significant association between hospitals, and professional performance for physicians, clinical officers, nurses and midwives, Chi-square test was used where the frequency was more than six while Fisher's exact probability test was used where the expected frequency was less than six

(LoBiondo-Wood & Haber,2013; LoBiondo-Wood & Haber, 2014). The confidence interval was set at 95 per cent and a 5 per cent level was regarded to be statistically significant. Adjusted logistic regression was done to enhance the findings (Lu, 2017). Tables and figures were used to improve the interpretation of the study finding (LoBiondo-Wood & Haber, 2013).

CHAPTER 4

RESULTS

4.1 Introduction

This chapter presents the finding of the study. The general objective of the study was to assess the knowledge of clinicians from two selected Hospitals in Lusaka to screen children under the age of five years for developmental disabilities (DDs) in Lusaka (Zambia). The specific objectives were to establish clinicians' awareness of children under the age of five years at risk of having DDs, to determine clinicians' knowledge to use the WHO Ten-question disability screening instrument to screen DDs in children under the age of five years, and to determine variables that may influence knowledge in using the DDs screening instrument.

4.2 Baseline demographic of the study participants

In this study, there were eight-eight participants. The median age was twenty-eight years (IQR, 25-36.6) and three-quarters sixty-six (75%) were females. The median duration of service was twenty-one months (IQR, 5-36). Slightly above two-thirds of the participants, sixty-seven (76.14%) were from Matero Level One Hospital. The majority, sixty-four (72.7%) were nurses while the least four (4.6%) were physicians (Table 1).

Table 1: Demographic characteristics of the study participants

Variable		
Age (years)*	28 (IQR, 25-36.6)	
Duration in service*	21 (IQR, 5-36)	
	Category	**Frequency (%)**
Gender		
	Male	22 (25.00)
	Female	66 (75.00)
Institution		
	Maina Soko Military Hospital	21 (23.86)
	Matero Level One Hospital	67 (76.14)
Profession		
	Nurses	64 (72.73)
	Nurse-midwives	8 (9.09)
	Clinical Officers	12 (13.64)
	Physicians	4 (4.55)

IQR=Interquartile range; *median and interquartile range reported. Source: Field work, 2019

4.3 Clinicians' awareness of children under the age of five years at risks of having DDs

To answer the objective concerning the clinicians' awareness of children under the age of five years at risks of having DDs, ten questions were answered by participants. Out of the eighty-eight participants, fifty-four (61.36%) were aware that children who suffer from disorders of the brain and or medical conditions affecting the central nervous system are prone to DDs. Only a quarter twenty-two (25.00%) of the participants were aware that the parents' health status and substance abuse by parents risk children to have DDs. (Table 2).

Table 2: Percentages of the specific population for clinicians' awareness of under-five children at risks of having DDs

Question	Total (88)	Nurses	Nurse-midwives	Clinical Officers	Physicians
Exposure to toxic materials	30 (34.10 %)	23 (76.67%)	3 (10.00%)	3 (10.00%)	1 (3.33%)
Child's healthy status	36 (40.91%)	23 (63.89%)	3 (8.33%)	7 (19.44%)	3 (8.33%)
Gestation age at birth	39 (41.32%)	28 (71.79%)	3 (7.69%)	5 (12.82%)	3 (7.69%)
Birth weight	30 (34.10 %)	20 (66.67%)	4 (13.33%)	3 (10.00%)	3 (10.00%)
Disorders of the brain	54 (61.36%)	37 (68.52%)	6 (11.11%)	8 (14.81%)	3 (5.56%)
CNS Conditions	54 (61.36%)	36 (66.67%)	6 (11.11%)	9 (16.67%)	3 (5.56%)
Neuro- disorders	40 (45.46%)	28 (70.00%)	3 (7.50%)	6 (15.00%)	3 (7.50%)
Parents' health status	22 (25%)	16 (72.732%)	2 (9.09%)	3 (13.64%)	1 (4.55%)
Substance abuse by parents	22 (25%)	15 (68.80%)	3 (13.64%)	2 (9.09%)	2 (9.09%)
Genetic disorders	30 (34.09%)	20 (66.67%)	3 (10.00%)	6 (20.00%)	1 (3.33%)
Average score	**35.7**	**24.6**	**3.7**	**5.2**	**2.3**

CNS=Central Nervous system. Source: Field work, 2019

4.4 Clinicians' knowledge to screen DDs in under-five children

To answer the objective about clinicians' knowledge to screen DDs in children under the age of five years participants answered fourteen questions. Out of eighty-eight participants, fifty (56.82%) had knowledge that screening the child for mobility would aid in identifying DDs in under-five children. However, only ten (11.36%) participants indicated that compared to children of the same age, children who had challenges in attaining milestones such as sitting, standing or ambulation had DDs (Table 3).

Table 3: Percentages of the specific population for clinicians' knowledge to screen DDs

Question	Total (88)	Nurses	Nurse-midwives	Clinical Officers	Physicians
Ability to screen for DDs	33 (37.50%)	23 (67.70%)	5 (15.15%)	3 (9.09%)	2 (6.06%)
Ability to use standardized tools	20 (22.73%)	13 (65.00%)	1 (5.00%)	3 (15.00%)	3 (15.00%)
Challenges to attain milestones	10 (11.36%)	7 (70.00%)	0 (0.00%)	2 (20.00%)	1 (10.00%)
Problems with seeing	19 (21.59%)	16 (84.21%)	1 (5.26%)	2 (10.53%)	0 (0.00%)
Difficulties with hearing	16 (18.18%)	12 (75.00%)	2 (12.50%)	1 (6.25%)	1 (6.25%)
Inability to understand	23 (26.14%)	17 (73.91%)	3 (13.04%)	2 (8.70%)	1(4.35%)
Assessing child's mobility	50 (56.82%)	38 (76.00%)	3 (6.00%)	6 (12.00%)	3 (6.00%)
History about fits or loss of consciousness	45 (51.14%)	35 (77.78%)	3 (6.67%)	3 (6.67%)	4 (8.89%)
Child's activities	43 (48.86%)	29 (67.44%)	3 (6.98%)	7 (16.28%)	4 (9.30%)
Child's ability to speak	42 (47.73%)	31 (73.81%)	3 (7.14%)	5 (11.90%)	3 (7.14%)
Probing about child's speech	32 (36.36%)	23 (71.88%)	3 (9.38%)	3 (9.38%)	3 (9.38%)
Inability to name objects at age ≥2 years	24 (27.27%)	19 (79.17%)	1 (4.17%)	4 (16.67%)	0 (0.00%)
Association between child's appearance and mental wellbeing	23 (26.14%)	19 (82.61%)	2 (8.70%)	2 (8.70%)	0 (0.00%)
Behavioural problem as a sign of DDs	21 (23.86%)	18 (85.71%)	1(4.76%)	2 (9.52%)	0 (0.00%)
Average score	**28.6**	**21.4**	**2.2**	**3.2**	**1.8**

DDs=Developmental disabilities. Source: Field work, 2019

4.5 Number of participants aware of children under the age of five years at risk of having DDs

The result showed that only thirty-six (40.91%) out of eighty-eight participants were aware of children under the age of five years at risks of having DDs.

4.6 Number of participants with knowledge to screen DDs in children under the age of five years

The study results revealed that twenty-seven (30.68%) out of eighty-eight participants had knowledge to screen DDs in children under the age of five years using the WHO Ten-question disability screening instruments.

4.7 Association between participants' demographic characteristics and participants' awareness of children at risks of having DDs

When the association between participants' demographic characteristics (gender, institution, and profession) with participants' awareness of children under the age of five years at risk of having DDs was conducted, no significant statistical association was observed ($p = 0.617$, $p = 0.220$, and $p = 0.474$ respectively) (Table 4).

Table 4: Association between participants' demographic characteristics and participants' awareness of under-five children at risks of having DDs

Variable	Not aware	Aware	P - value
Gender: **			
Male	12 (54.5%)	10 (45.5%)	P = 0.617
Female	40 (60.6%)	26 (39.4%)	
Institution: **			
Matero Level One Hospital	42 (62.7%)	25 (37.3%)	P = 0.220
Maina Soko Military Hospital	10 (47.6%)	11 (52.4%)	
Profession*			
Nurses	40 (62.5%)	24 (37.5%)	P=0.474
Nurse-midwives	4 (50.0%)	4 (50.0%)	
Clinical officers	7 (58.3%)	7 (41 .8%)	
Physicians	1 (25.0%)	3 (75.0%)	

** Chi-square test, * Fisher's test was used. Source: field work, 2019

4.8 Association between participants' demographic characteristic and their knowledge to screen DDs

When the association between participants' demographic characteristic (gender, institution, and profession) with participants' knowledge to screen DDs in children under the age of five years was conducted, the results showed no significant statistical association (p = 0.894, P = 0.763 and P = 0.474 respectively) (Table 5).

Table 5: Association between participants' demographic characteristic and their Knowledge to screen DDs

Variable	No knowledge	Knowledge	P value
Gender**			
Male	15 (68.2%)	7 (31.8%)	P = 0.894
Female	46 (69.7%)	20 (30.3%)	
Institution**			
Matero Level One Hospital	47 (62.2%)	20 (29.5.3%)	P = 0.763
Maina Soko Military Hospital	14 (66.7%)	7 (33.3%)	
Profession*			
Nurses	45 (70.2%)	19 (29.7%)	P = 0.474
Nurse-midwives	6 (75.0%)	2 (25.0%)	
Clinical officers	8 (66.7%)	4 (33.3%)	
Physicians	2 (50.0%)	2 (50.0%)	

** Chi-square test, * Fisher's test was used. Source: Field work, 2019

4.9 Adjusted logistic regression for participants' demographic characteristics and participants' awareness of children under the age of five years at risk of having DDs

In this study, when adjusted logistic regression was done using the investigator-led method, the results showed that every one unit increase in age (years) was associated with 5 per cent less likely to be aware of children under five at risk of having DDs (AOR = 0.95, 95% CI [0.85 -1.04]; p = 0.915). The females were 34 per cent less likely to be aware of children under five at risk of having DDs compared to males (AOR= 0.66, 95% CI [0.21-2.10]; p = 0.472). Furthermore, when the adjusted logistic regression for the institutions was conducted, the results showed that the Maina Soko Military Hospital odds were1.22 times higher to be aware than that of Matero Level One Hospital (AOR= 1.22, 95% CI [0.40, 3.76]; p=0.728). Additionally, adjusted logistic regression for professions showed that the physicians' odds were 2.3 times higher to be aware of under-five at risk of having DDs than that for the nurses (AOR=2.27, 95% CI [0.28 - 18.47]; p=0.447). Regarding participants' duration of service, the adjusted logistic regression results also showed that every one-unit increase in the duration of service (months) was associated with 1 per cent more likely to be aware of children under five at risk of having DDs (AOR=1.01, 95% CI [1.00 - 1.02]; p=0.145) (Table 6).

Table 6: Adjusted logistic regression for participants' demographic characteristics and participants' awareness of children under the age of five years at risks of having DDs

Variable	AOR	95% C I	P - value
Age (years)	0.95	0.85-1.04	0.315
Gender			
Male	Ref		
Female	0.66	0.21- 2.10	0.479
Institution			
Matero Level One Hospital	Ref		
Maina Soko Military Hospital	1.22	0.40 - 3.76	0.729
Profession			
Nurses	Ref.		
Nurse-midwives	1.82	0.29 -11.05	0.527
Clinical Officers	0.52	0.12 - 2.35	0 .398
Physicians	2.27	0.28 - 18.47	0.443
Months in service	1.01	1.00 – 1.02	0.145

AOR=Adjusted odd ratio; CI= Confidence interval; Ref = Reference. Source: Field work, 2019

4.10 Adjusted Logistic Regression for Participants' Demographic Characteristics and Participants' Knowledge to Screen DDs

When adjusted logistic regression was done, the results showed that every 1unit increase (years) was associated with 1 per cent less likely for the participants to have the knowledge to screen DDs in children under the age of five years (AOR= 0.99, 95% CI [0.92 -1.09]; p = 0.991). Regarding participants' gender, the females were 2 per cent less likely to have knowledge to screen DDs in children under the age of five years than that of males (AOR = 0.98, 95% CI [0.30 - 3.45]; p = 0.975). Adjusted logistic for the institutions showed that participants from Matero Level One Hospital were 22 per cent less likely to have the knowledge to screen for DDs in children under the age of five years compared to Maina Military Hospital (AOR = 0.78, 95% CI [0.26 - 2.38]; p = 0.662]). Regarding participants' profession, physicians odds were two and half times higher than that of the nurses (AOR= 2.52, 95% CI [0.32 - 20.14]; p=0.383). The results further showed that every 1 per cent increase in the duration of service (months) was associated with 1 per cent less probability of having the knowledge to screen DDs in children under the age of five years (AOR=0.99, 95%CI [0.97 - 1.01]; p=0.895) (Table 7).

Table 7: Adjusted logistic regression for participants' demographic characteristics and participants' knowledge to screen DDs

Variable	AOR	95% C I	P - value
Age (years)	0.99	0.92 -1.09	0.991
Gender			
Male	Ref		
Female	0.98	0.30 - 3.45	0.975
Institution			
Maina Soko Military Hospital	Ref.		
Matero Level One Hospital	0.78	0.26 -2.38	0.662
Profession			
Nurses	Ref.		
Nurse-midwives	0.67	0.09 - 5.00	0.692
Clinical Officers	1.18	0.28 -4.86	0.822
Physicians	2.52	0.32 -20.14	0.383
Duration in service (months)	0.99	0.97 - 1.01	0.895

AOR = Adjusted odd ratio; CI= Confidence interval; Ref = Reference. Source: Field work, 2019

4.11 Predictive Margins between participants' age and gender, and the probability of being aware of risks for children to have DDs

The probability of the participant being aware of children under the age of five years at risk of having DDs reduced as one advanced in age. Given two average participants who have similar characteristic such as age, but one being male 20 years of age and being female 20 years of age but only differ in gender, the probability for a male to be aware of children under the age of five years at risk of having DDs was almost 0.5 while for females it was around 0.38 (Figure 1).

Figure 1: Predictive Margins of knowledge -gender

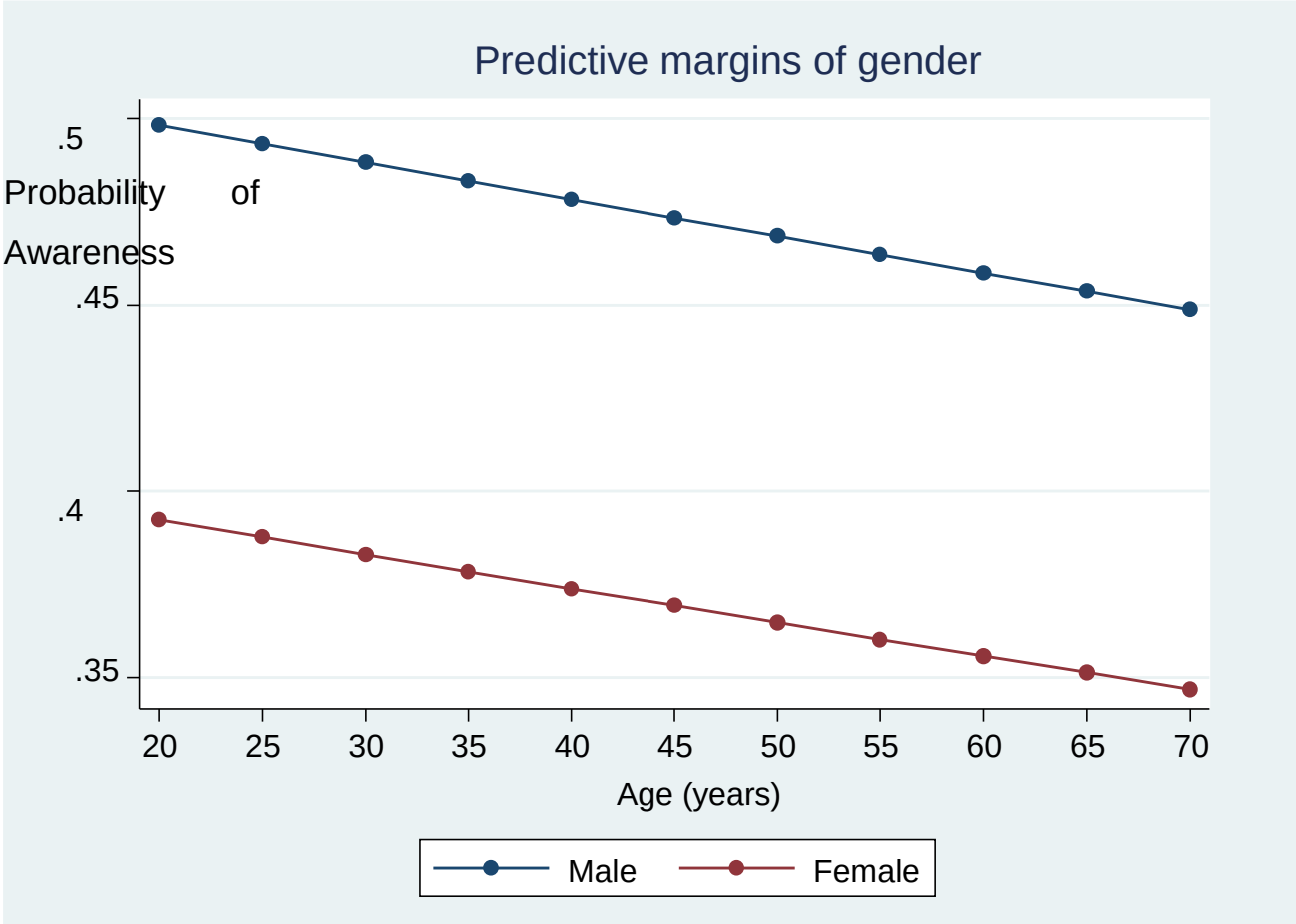

Figure 1: Predictive Margins of gender- gender

Source: Field work, 2019

4.12 Predictive Margins between participants' age and gender, and the probability of the participant having knowledge to screen DDs

The probability of the participant to have knowledge to screen DDs in children under the age of five years reduced as one advanced in age. Given two average participants who have similar characteristics but one being male 20 years old and the other being female 20 years old, the but only differ in gender, the probability for male to have knowledge to screen DDs in children under the age of five years was about 0.311 compared to 0.307 for the females (Figure 2).

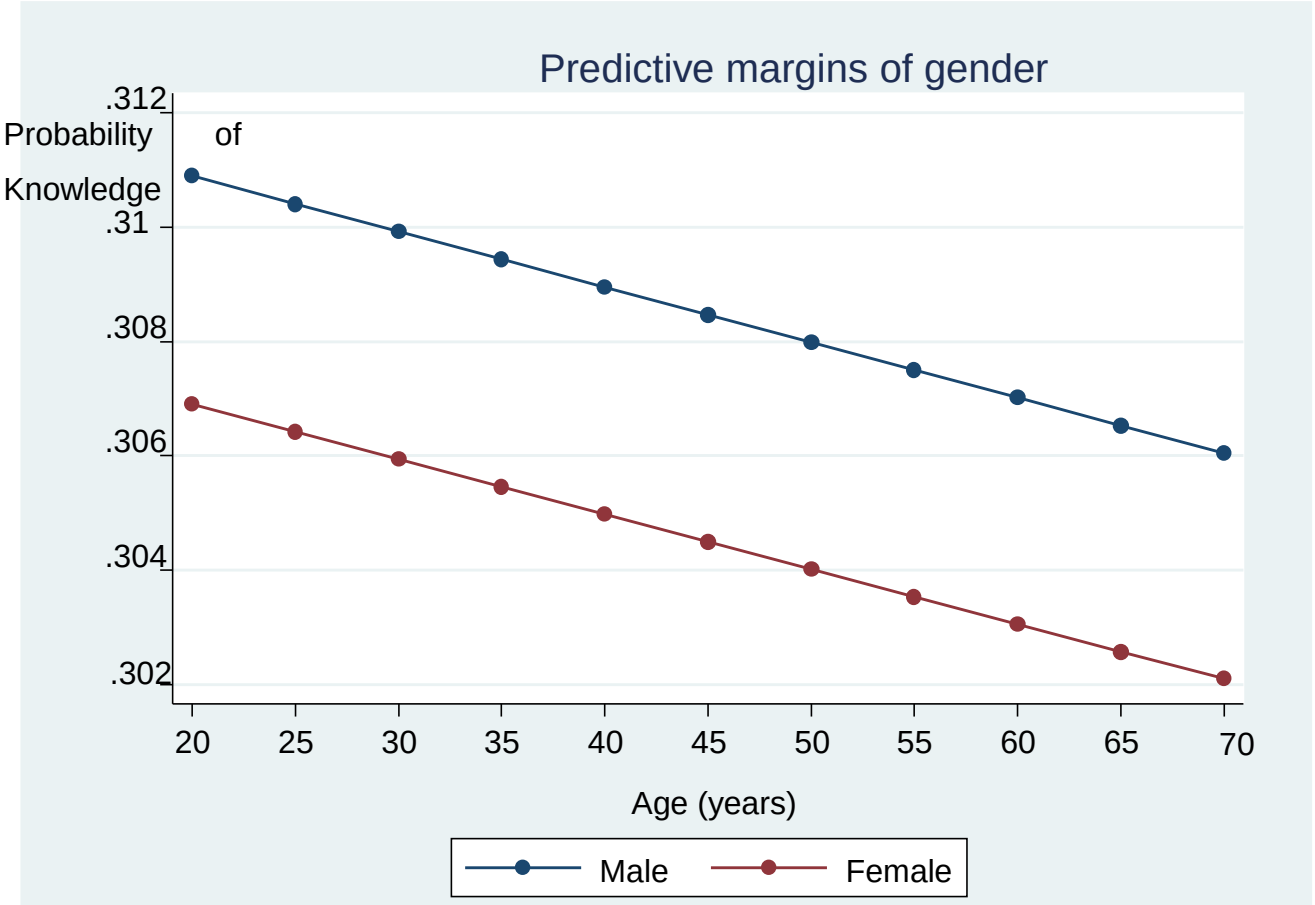

Figure 2: Predictive Margins gender.

Source: Field work, 2019

4.13 Predictive margins between participants' institution and duration of service (months), and the probability of the participant being aware of children under the age of five years at risks of having DDs

The results showed that there was a difference in participants' awareness of children under the age of five years at risks of having DDs between the two institutions. The result showed given two participants with similar characteristics such as participant's duration of service, but one being from Maina Soko Military Hospital and the other being from Matero Level One Hospital, the probability for the participant from Maina Soko Military Hospital to be aware of under-five children at risk of having DDs at 0 months of service was slightly above 0.4 compared to 0.3 for the participant from Matero Level One Hospital with the same duration of service (Figure 3).

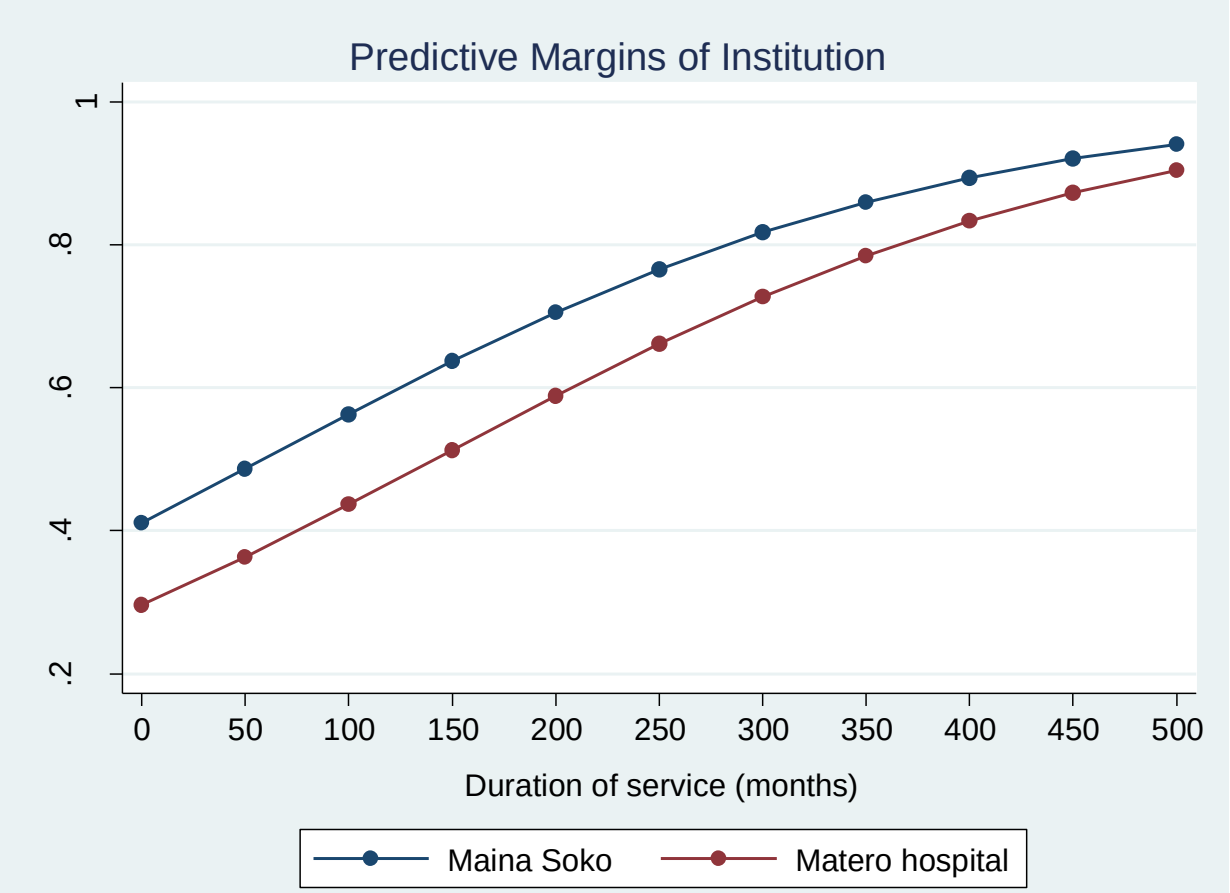

Figure 3: Predictive Margins institution –awareness.

Source: Field work, 2019

4.14 Predictive Margins between participants' institution and duration of service (months), and participants' knowledge to screen DDs in children

The results revealed that for both institutions as the duration of service (months) increased, there was also a steady increase in knowledge for clinicians to screen DDs in children under the age of five years. However, given two average participants who have similar characteristics such as duration of service, but one being with 100 months in service at Maina Soko Military Hospital and the other being with 100 months of service at Matero Level One Hospital but differ institutions, the probability for the participant from Maina Soko Military to have the knowledge to screen DDs in children under the age of five years was slightly above 0.35 compared to 0.3 for participants from Matero Level One Hospital (Figure.4).

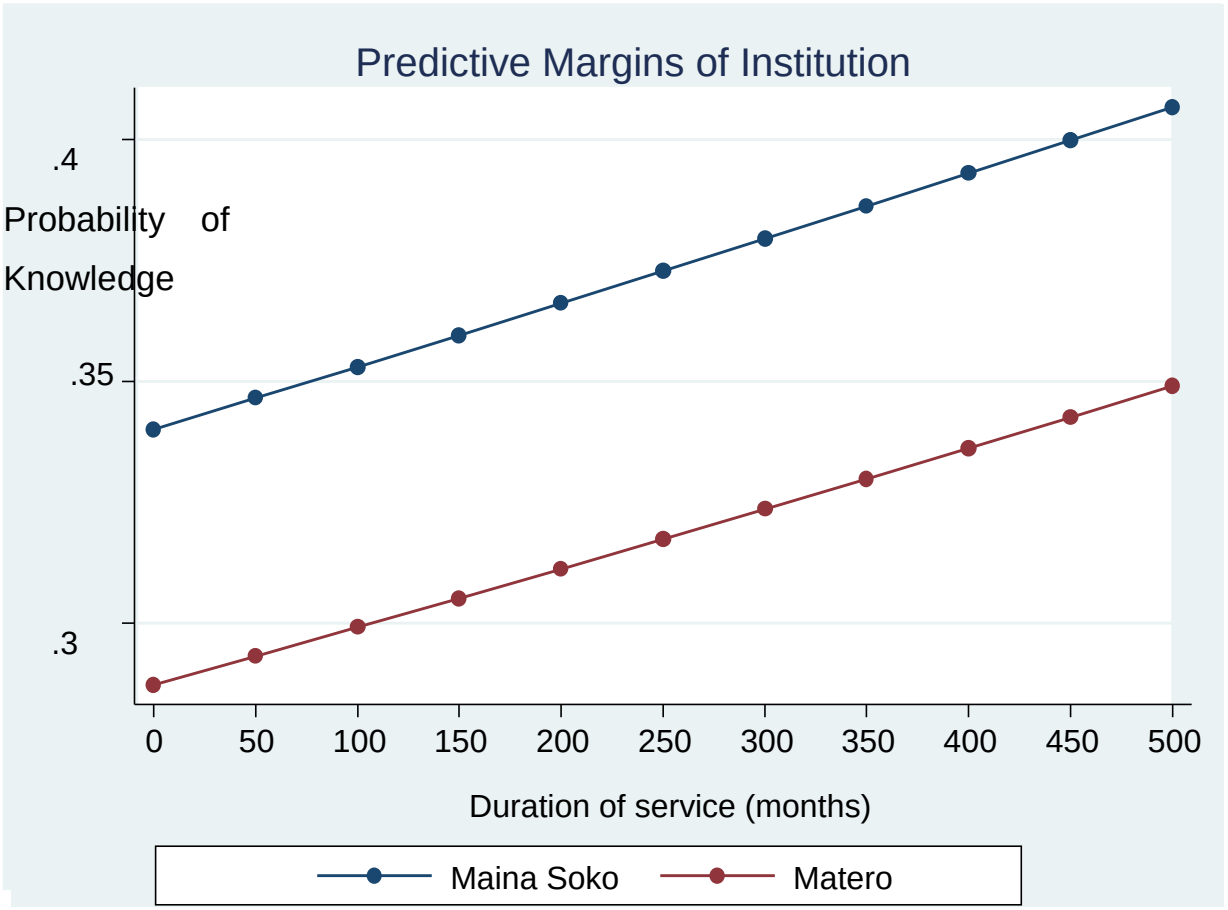

Figure 4: Predictive Margins for institution- knowledge.

Source: Field work, 2019

4.15 Predictive Margins between participants' profession and duration of service (months), and participants' awareness of children under the age of five years at risk of having DDs

Generally, the results showed an increase in participants' awareness of children under the age of five years at risk of having DDs as the duration of service (months) increased. The results also showed that physicians were the most aware of children under the age of five years at risk of having DDs. Being a physician with a duration of 0 months in service, the probability of being aware of children under the age of five years at risk of having DDs was 0.75 compared to 0.19 for the midwives with the same duration of service. The results also showed a close performance between clinical officers and nurses. The probability of the clinical officer with 0 months of service to be aware of children under the age of five years at risk of having DDs was around 0.27 compared to almost 0.265 for nurses (Figure .5).

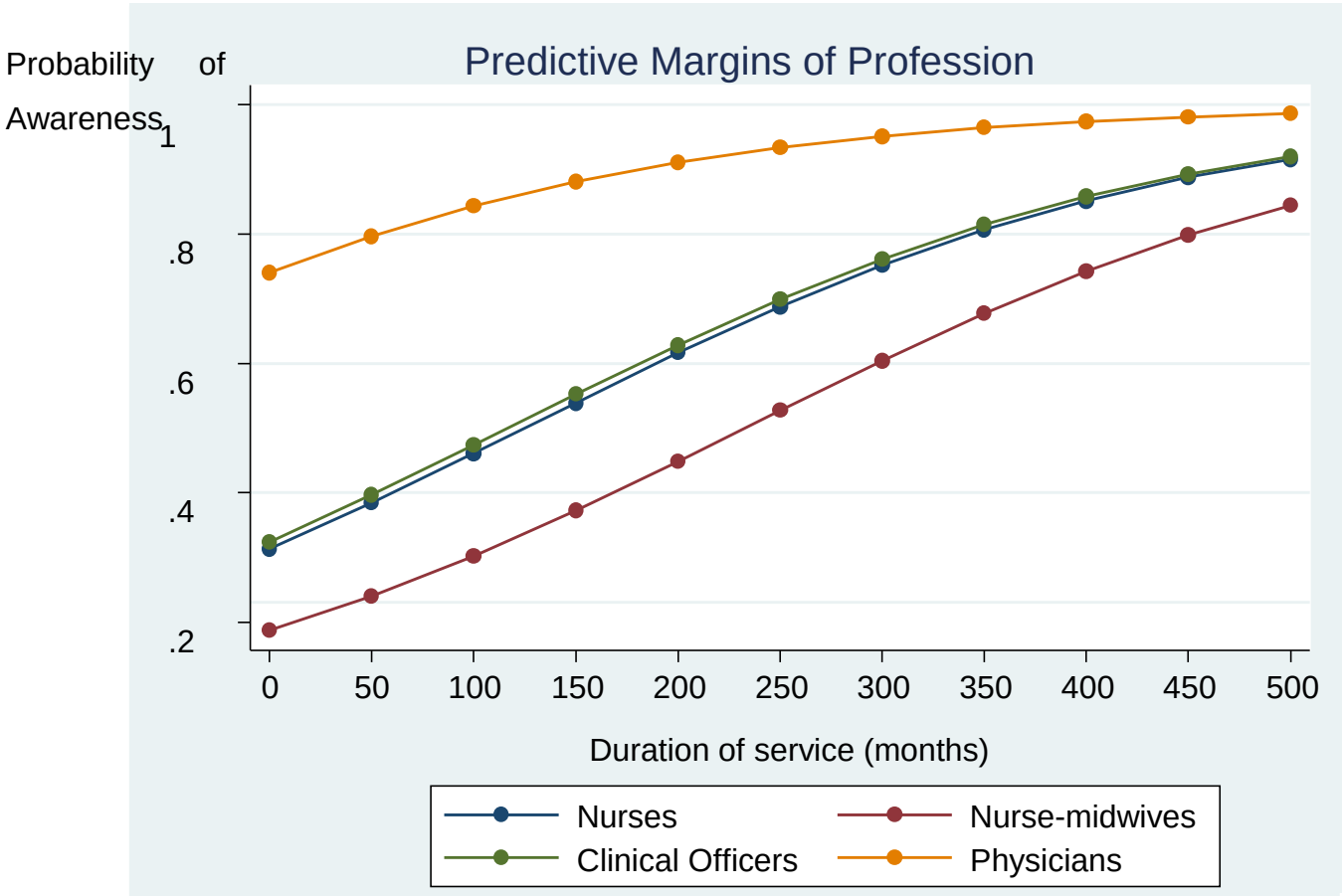

Figure 5: Predictive margins for the profession

Source: field work, 2019

CHAPTER 5

DISCUSSION

5.1 Overview of findings

This chapter presents a discussion of results for the study on assessing clinicians' knowledge to screen development disabilities in children under the age of five years from two selected hospitals in Lusaka, Zambia. The discussion of the results were divided into three sections based on the three objectives of the study. The specific objectives were to establish clinicians' awareness of children under the age of five years at risk of having DDs, to determine clinicians' knowledge to use the WHO Ten-question disability screening instrument to screen DDs in children under the age of five years, and to determine variables that could influence knowledge in using the screening instrument. It is important to note that results were not statistically significant possibly due to the difference in participants' awareness and knowledge which could be due to a mixed group of health institutions and healthcare professionals surveyed, as well as different exposure to awareness and knowledge during their training.

5.2 Clinicians' awareness of children under the age of five years at risk of having DDs

The study discovered that majority, fifty-two (59.1%) of the participants were not aware of children under the age of five years at risk of having DDs. However, the overall score for the clinicians' who were not aware of risks for children under the age of five years to have DDs was fifty-two (59.1%), indicating that there was a gap in clinicians'

awareness of children under the age of five years at risk of having DDs. The study findings are similar to the Malaysian study by Moyle *et al.* (2010) which showed a gap in recent graduated clinician's awareness of their role in the identification of disabilities. Similarly, Moss and Jackson (2019) noted that clinicians lacked awareness of their roles and concluded by stating that mentorship of the newly qualified nurses was vital for their success in healthcare delivery. The findings are further comparable to Corsano et al. (2020) findings which revealed that nurses did not know which diseases could lead to intellectual disability and their onset, although they had simple knowledge of intellectual disabilities

Regarding clinicians' ability to identify children under the age of five years at risk of having DDs, above half (61.36%) were aware that children who suffered from disorders of the brain and or medical conditions affecting the central nervous system were prone to DDs. Early childhood malaria parasite attack causes low cognitive as well as low socio-emotional development in children (Fink et al., 2013). The findings differ from the Italian study report which showed that although all the ninety-three (100%) of the nurses who participated in the study were aware of autism spectrum disorder, they had low scores concerning awareness of other medical conditions which children could suffer (Corsano et al., 2020). However, both findings showed gaps in clinicians' awareness of children under the age of five years at risk of having DDs which could disadvantage children.

On the other hand, only twenty-two (25%) out of eighty-eight participants were aware that substance abuse by parents and the parents' health status risked children to DDs. Lam *et al.* (2013), asserts that prenatal exposure to substances like mercury causes

intellectual DDs. Similarly, MCDMCH (2015) stated that lead pollution causes intellectual disability particularly in children.

Regarding the parents' mental status, Pierce *et al.* (2020) state that parents' mental health disorder risk children having physical health ailments and concludes by asserting that awareness of the physical health risks for such children is important in promoting their lives.

Furthermore, the odds of female participants were 0.62 less than that of males (AOR = 0.62, 95% CI = [0.92, 1.08] p =0.412). It is important to note that, the results showed no significant statistical difference although the findings conform with the study done at Komfo Anoktye Teaching Hospital, which disclosed that male nurses provided more satisfying nursing care than female nurses (Budu et al., 2019). Additionally, the study conducted in South Africa revealed that student male nurses faced challenges during training compared to female student nurses, which can negatively affect their self-esteem during health care delivery (Buthelezi et al., 2015).

The study findings differ from a Tanzanian study that investigated factors that influence nurses' service delivery in clinical areas which reported an association between gender and service delivery (Gemuhay et al., 2019). According to Gemuhay *et al*. (2019), male nurses' knowledge in clinical practice was negatively affected by work situation whereas female nurses' knowledge in clinical practice was negatively affected due to their nervous state. However, measures such as orientating nurses to the clinical setting and practice, regular supervision and modifying practice according to gender may improve clinicians' knowledge in clinical practice (Gemuhay et al., 2019).

The Matero Level One Hospital odds was less than that of Maina Soko Military Hospital (CO = 0.58, 95% CI = [0.20, 1.73]; p = 0.33). The differences in areas of operation could have caused the difference in clinicians' performance. The unavailability of medical instruments negatively nurses' and the health facility's healthcare provision as medical equipment are important in patient/client management (Moyimane et al., 2017). In Zambia, socioeconomic disparities/inequity in government health facilities such as health post and health clinics have been reported to cause disparities in healthcare provision (Phiri & Ataguba, 2014). The study finding was comparable to the Malaysian study which revealed that newly graduated physicians, trained from different institutions, had different perceptions of their role in the identification of DDs (Moyle et al., 2010). The study findings are further compared to the United Kingdoms (UK) study, which reported that engaging clinicians in research promote quality health care provision as the clinicians get equipped (Boaz et al., 2015).

Concerning gender, female odds were less than that of males (COR = 0.98, 95% CI = [0.29, 3.24]; p = 0.975). Deficiency in knowledge might have been due to a lack of confidence. The study findings are in line with the Pakistani study, which highlighted that male nurses were more knowledgeable of their patients' conditions and had the skill to care for them better than female nurses (Younas & Sundus, 2018). Furthermore, the study done at Komfo Anoktye Teaching Hospital showed that male nurses had more knowledge than female nurses when caring for the patients.

The odds for Matero Level One Hospital were less than the odds for Maina Soko Military Hospital (AOR = 0.78, 95% CI = [0.26, 2.38]; p = 0.662]). This could have been due lack of engagement in continuous learning and research. A study conducted

in the UK highlighted that engaging clinicians in research promote quality health care provision as the clinicians get equipped (Boaz et al., 2015).

In addition, the physician odds ratio was higher than that of nurses (AOR = 2.52, 95% CI = [0.32, 20.14]; p = 0.383). This could have been because physicians generally screened patients to make a diagnosis. Well defining clinicians' line of service delivery, removing clinicians' role stressors, as well as providing required resources promotes evidence-based practice (Campbell & Profetto-McGrath,2013). The Malaysian study revealed what physicians learnt during training, a practical skill gained and clear physician role identification promoted clinicians' knowledge to screen for DDs (Moyle et al., 2010). However, it is worth noting that clinicians' delivery of quality healthcare services is also enhanced by staff values, inspiration, behaviour and their relationship with the patients (Farr & Cressey, 2015) In line with that, study findings are not comparable to Laurant et al. (2018) finding which revealed that for some patients' conditions nurses provided similar or better healthcare service than frontline physicians. Therefore, the above results showed that there was a gap in clinicians' awareness of risks for children under the age of five years to have DDs.

In agreement with Rosenbaum (2012) and Wilson *et al.* (2013), increasing awareness of developmental coordination disorder (DCD) required effective translation of our knowledge about DCD prevalence, impact on daily life, and the serious consequences if left unrecognised and unsupported. Any approach adopted to increase recognition of DCD must be in accordance with the context of the region and match the target group, whether this is the general public, educational professionals or health practitioners.

On the other hand, researchers have an important role to play by providing written and oral reports which are user-friendly and accessible to parents and service providers, as well as presented in scientific journals and at large conferences.

5.3 Knowledge to use the WHO TQ disability screening instrument to screen DDs in children under the age of five years

Overall, the study showed that almost three-quarters, sixty-one (69.3%) of the participants had no knowledge to screen DDs in children under the age of five years. Participants from Maina Soko Military Hospital had more knowledge to screen DDs in children under the age of five years compared to participants from Matero Level One Hospital. Primary health care physicians play a crucial role in identifying children with developmental delays at a young age. They are in regular contact with the child from birth to adolescence and therefore can monitor development longitudinally, allowing for a better understanding of the child's immediate developmental trajectory (Ertem & WHO, 2012; Lipkin et al 2020). The WHO TQ disability screening instrument for Childhood Disability was developed to serve as a rapid, low-cost tool to assist in the identification of children with serious disabilities in the population of limited resources. In addition, it is short and simple to be used and has already been culturally validated. It has good sensitivity to pick up serious cognitive, motor and seizure deficits but lower sensitivity for vision and hearing deficits warranting the inclusion of separate hearing and vision screens (Fischer, Morris & Martines, 2014).

When the association between participants' demographic characteristic (sex, institution, and profession) with participants' knowledge to screen DDs in children under the age of five years was conducted, the results showed no association ($p = 0.894$, $P = 0.763$ & $P = 0.474$). Clinicians' exposure to DDs and clinical practice coupled with

mentorship could improve knowledge in screening for DDs. These study findings are similar to the study conducted in Malaysia among newly qualified physicians which showed a discrepancy in knowledge screening for DDs (Moyle et al., 2010). However, the results showed a gap in clinicians' knowledge to use the WHO ten-question disability screening tool. In Saudi Arabia, Ashri *et al.* (2014) also reported a gap in physicians' skill despite being aware of the need to use evidence-based learning practice. Similarly, Manzi *et al.* (2017) in a study conducted in sub-Saharan Africa, noted a lack of knowledge in clinicians who did not receive mentorship and concluded by stating that mentorship and coaching are key in closing the gap.

5.4 Factors influencing clinicians' knowledge to use the screening instrument

A further analysis on Clinicians' knowledge to screen DDs in under-five children was assessed by three dimensions while considering all factors under review:

1. Participants' knowledge screen DDs in children in children under the age of five years and participants' awareness of under-five children at of having DDs
2. Participants' knowledge to screen DDs and age to screen DDs in children under the age of five years.
3. Participants knowledge to screen DDs and duration of service (months).

5.4.1 Participants' knowledge screen DDs in children under the age of five years and participants' awareness of children under the age of five years at of having DDs

Clinicians' knowledge to screen DDs in children under the age of five years was not adequate in the majority of the participants-sixty-one (69.3%) out of eighty-eight. These findings are similar to the findings for a study conducted in the UK by Yon *et al.* (2015) which showed that junior physicians had inadequate knowledge to attend to patients with some conditions.

Furthermore, the findings are also comparable to the findings for a study conducted in the United States of America (USA), which showed a gap in clinicians' knowledge and practice concerning health care delivery to children who have DDs and need special education. (Shah et al., 2013).

Despite similar findings in UK and USA, lack of knowledge to screen children under the age of five years for DDs can make children miss opportunities for rehabilitation even when they are consistently being attended by clinicians during the under-five years old period (Krishnamurthy & Srinivanasan, 2011). Knowledge can enhance the identification of children with DDs and subsequence provision of rehabilitative programmes as early identification of disabilities lead to the timely institution of rehabilitative measures so that such children are helped to achieve full development (Ertem & WHO, 2012; UNICEF (2013). However, coupled with a lack of knowledge, equipment to administer the test is vital in Low- and Middle-Income countries (LAMI). WHO (2012), found that in most LAMI countries health care providers do not routinely use screening instruments. If screening had to be routinely implemented for all children, then there was a need to have instruments that were affordable and simple. Lay health workers who had access to young children at risk of and with disabilities, would then be able to use them.

Furthermore, cultural issues impacted the outcome of screening tests significantly. Child development and disability-related concepts were understood differently in different contexts. This was noted in historical studies in India, China, Thailand (Lansdown, 1996) as well as in Malawi, (Gladstone et al, 2008**).** Ertem and WHO (2012), further asserts that in most LAMI countries, the health care system does not

have a model for the promotion and monitoring of the development of children, prevention and early identification of risk factors associated with developmental difficulties, and early interventions. Health care providers may not have the appropriate knowledge and expertise, and service delivery systems may be inadequate. Thus, the study was timely as it sought to help clinicians and systems in LAMI countries to build such local capacity. However, consideration must be in building local capacity, specific to the needs of LAMI countries as advocated, as way back as 2007, use of functional outcomes that cut across cultures rather than creating culture-specific tools in each country (Maulik & Darmstadt, 2007; Ertem et al., 2008).

5.4.1.1 Association between participants' demographic characteristics (gender, institution, and profession) with participants' awareness of children under the age of five years at risk of having DDs

When the association between participants' demographic characteristics (gender, institution, and profession) with participants' awareness of children under the age of five years at risk of having DDs was conducted, no significant statistical association was shown ($p = 0.617$, $p = 0.220$, and p-0.474 respectively). This could have been a result of similarities in curricula and work place environment. A situational review conducted in some African countries (Kenya, Nigeria, South Africa and Uganda) to review the training and curricula for clinicians to substantiate area for improvement reported that there was a gap both in training programmes and in the training process (Couper et al., 2018). Nevertheless, Makasa et al. (2015) highlighted that clinical officers were trained to offer basic health service delivery whereas physicians were trained to offer holistic practical and preventive health services and were to oversee other clinicians in health institutions This could have been a result of similarities in curricula and work place environment.

The study findings are similar to the findings for a study conducted in Malaysia, which discovered that there was inconsistency in the identification of DDs by newly graduated clinicians who trained from different institutions (Moyle et al., 2010). The findings are also similar to the Cochrane review of primary healthcare services delivered by nurses compared to that delivered by physicians which highlighted that for some patients' conditions nurses provided similar or better healthcare service than frontline physicians (Laurant et al., 2018)

However, current clinicians can be more aware of children under the age of five years at risk of having DDs because they are exposed to more advanced learning materials. According to Maggio *et al.* (2019), clinicians who access learning materials electronically have more understanding and improved performance. Therefore, continued staff development through the use of modern methods of learning should be encouraged to enhance clinicians' awareness of under-five children having DDs.

5.4.1.2 Association between gender and awareness of children under the age of five years at risk of having DDs

Furthermore, for gender versus awareness of children under the age of five years at risk of having DDs, the odds of females were 0.62 less than that of males (AOR = 0.62, 95% CI = [0.92, 1.08] p = 0.412). This could have been due to personal attributes. According to Morelli et al. (2014), physicians liked using clinical judgment than using screening instruments, and physicians did not have the time and training required to screen for DDs. Morelli *et al*. further indicated that physicians needed training and time for them to be able to conduct developmental screening. The findings conform with the study done at Komfo Anoktye Teaching Hospital, which disclosed that male nurses provided more satisfying nursing care than female nurses (Budu et al., 2019).

However, the study conducted in South Africa revealed that student male nurses faced challenges during training compared to female student nurses which can negatively affect their self-esteem during health care delivery (Buthelezi et al., 2015).

5.4.1.3 Association between participants' awareness of children under the age of five years at risk of having DDs and participant's institution of work

Comparison of participants awareness of children under the age of five years at risk of having DDs and place of work, the Matero Level One Hospital odds were less than that of Maina Soko Military Hospital (AOR = 0.58, 95% CI = [0.20, 1.73]; p = 0.33). The differences in areas of operation could have caused the difference in clinicians' performance. A Zambian study that assessed socioeconomic disparities/inequity in government health facilities reported a difference in service delivery among the visited health posts and health clinics which caused disparities in healthcare provision (Phiri & Ataguba, 2014), signifying that the environment clinicians' work from affecting their health care provision. The study finding was comparable to the Malaysian study which revealed that newly graduated physicians trained from different institutions had different perceptions of their role in the identification of DDs (Moyle et al., 2010). The study finding was further compared to the UK study which reported that engaging clinicians in research promote quality health care provision as the clinicians get equipped (Boaz et al., 2015).

5.4.1.4 Participants' profession and awareness of children under the age of five years at risk of having DDs

Regarding the profession, Physician odds was higher than that for the nurses (AOR = 6.56, 95% CI = [0.61, 70.94]; p = 0.121). This might have been influenced by the differences in the clinicians' curricula and role identification.

It could also have been as a result of mentorship as highlighted by Manzi et al. (2017) that mentorship and teaching services improved clinicians' clinical care and decision making. Furthermore, exposure to some medical conditions promotes clinicians' awareness of such medical conditions (Ekeh & Ekrikpo, 2015). As stated above, a study done in Malaysia showed that there was a difference in screening for DDs among newly graduated physicians who were trained from two different training institutions (Moyle et al., 2010). In addition, physicians conducted most of the screening of patients. A study conducted in Zambia showed that physicians were trained to offer holistic practical and preventive health services and they were to oversee other clinicians in health institutions (Makasa et al., 2015). The report further strengthens the proposition that profession may influence knowledge to screen DDs in children. Again, this was similar to the Malaysian study which indicated that clear role identification makes the clinicians improve their awareness of their responsibility in health care delivery (Moyle et al., 2010).

5.4.1.5 The probability of the participant to be aware of children under the age of five years at risk of having DDs

When the prediction was done, the probability of the participant being aware of children under the age of five years at risk of having DDs reduced as one advanced in age. Lack of research engagements as clinicians advanced in age could create a gap in awareness children under the age of five years at risk of having DDs. Boaz *et al.* (2015), disclosed that engaging clinicians in research improve their health care delivery. However, the finding is not comparable to a Nigerian study that sought to understand socio-demographic characteristics that influenced physicians' patient-centred care in the nation's four selected hospitals which revealed that physicians who were more or equal to 30 years old provided more patient-centred care compared to their counterparts who

were equal or less than 30 years old (Abiola et al., 2014). The current findings are further not comparable to a Sudanese study that investigated job consummation amongst physicians working at national hospitals which reported that age influenced job fulfilment and factors such as deficiency of training, workload and work settings among others negatively influenced physicians' health care delivery (Suliman et al., 2017).

5.4.1.6 The probability for male to be aware of children under the age of five years at risk of having DDs

However, being male aged twenty years of age and being female twenty years of age, the probability for the male to be aware of children under the age of five years at risk of having DDs was 0.1 more than for females to be aware of children under the age of five years at risk of having DDs. The finding was in conformity with Budu *et al.'s* (2019) argument to promote the role of the male nurses to the public to match with diversity patient care required. Likewise, Younas and Sundus (2018) reported that male nurses showed more concern about their patients, were aware of the patients' conditions and could explain clearly both the medical and nursing procedures.

Nevertheless, being male aged thirty years and being female aged thirty years, the probability for the male to have knowledge and skill to screen DDs in children under the age of five years was 0.004 higher than for the females. Possibly this could be that male clinicians were more particular about their performance. The study finding approved the assertion by the Pakistan study which showed that male nurses had knowledge and skill about their patients' conditions and the required care (Younas & Sundus, 2018).

Knowledge can enhance the identification of children with DDs and the provision of rehabilitative programmes. UNICEF (2013), indicated that early identification of disabilities lead to the timely institution of rehabilitative measures so that such children are helped to achieve full development.

5.4.2 Knowledge to screen DDs and age to screen DDs in children under the age of five years

When a comparison between participants' age and their level of knowledge to screen children under the age of five years for DDs was done, the results showed that participants who had the knowledge to screen DDs in children under the age of five years were older than those who did not have the knowledge. However, there was no statistical difference in P=0.538. This could have been a result of previous work experience. The study findings are in agreement with Hill (2010) who disclosed that older nurses had more knowledge in clinical practice than younger nurses. Hill (2010) also disclosed that the retirement of such knowledgeable nurses would negatively impact patient care and clinical practice. Similarly, Corsano et al. (2020) reported that older nurses as well as those nurses who either worked in a paediatric ward or with children with autism spectrum disorder had higher levels of knowledge about autism spectrum disorder. However, Hill (2020) was quick to report that if nurses received mentorship, their knowledge levels would improve and they would be able to provide quality patient care. Likewise. Manzi *et al.* (2017), in their Rwandan study, discovered that mentorship improves clinicians' knowledge.

The probability of the participant to have knowledge to screen DDs in children under the age of five years reduced as one advanced in age. As earlier indicated, this could be due to a lack of exposure to current nursing roles. A Rwandan study testified that nurses

who received mentorship adherence to treatment guidelines due to knowledge and skill gained (Ndayisaba et al., 2017). Thus, concluding that clinical judgment and expertise was required to assimilate the information obtained from the child and other key informants. However, the findings are comparable to the United States of America study that examined the outcome of admitted patients treated by either the younger or the older physicians which reported that apart from patients who were treated by younger physicians in large numbers, the younger physicians outperformed the older physicians (Tsugawa et al., 2017).

5.4.3 Knowledge to screen DDs and duration of service (months)

In this study, duration of service (months) and knowledge, to screen DDs was assessed in association with:

i. Age of participants.

ii. Awareness of under-five children at risks risk of having DDs

*5.4.3.1 Duration of service (months) and their Knowledge **to screen DDs***

The results showed that there was no statistical difference in duration of service (months) between those who had the knowledge to screen DDs in children under the age of five years and those who had no knowledge $p = 0.896$. This could have been partly because of exposure to continuous learning opportunities offered to clinicians and possible clear role assignment for the clinicians. It could also have been due to a lack of continuously practising the skill by the long-serving clinicians to develop competence. The results are comparable to the finding for the study done in Malaysia which revealed that lack of consistency in clinical practice and lack of clear role assignment cannot promote competence (Moyle et al., 2010). The findings also support

the claim that excellence practices depend on staff values, interest, behaviour as well as staff relationship with the patients (Farr & Cressey, 2015). The findings further back the argument by Hill (2010) which reported that mentorship for nurses with less duration of service improves their knowledge and closes the knowledge gap between nurses with longer duration of service and those with a lesser duration of service.

However, the study results showed that every one unit increase (years) was associated with 1 per cent less likely for the participants to have the knowledge to screen DDs in children under the age of five years (AOR = 1.00, 95% CI= [0.92, 1.08]; p=0.918). Similarly, every 1 per cent increase in the duration of service (months) was associated with 1 per cent less probability of having the knowledge to screen DDs in children under the age of five years (AOR=1.00, 95%CI= [0.99, 1.00]; p=0.895. As earlier stated, this might have been due to a lack of updates in current role assignment and mentorship which can enhance knowledge for screening DDs in children. The study findings are comparable to the study results done in Korea which showed that work skill in older nurses was not gained by the duration of service but by sound reasoning (Chung et al., 2015). Additionally, a Rwandan study stated that mentorship helps nurses adhere to current service guidelines (Ndayisaba et al., 2017).

On contrary, these findings are not comparable to Hill (2010)'s argument that duration of service improves nurses' clinical practice due to experience. Hill (2010) argued that duration of experience in nursing promoted knowledge and therefore has a positive influence on the quality of health. Likewise, another study revealed that clinicians' attitude, motivation, behaviour as well as staff relationship with the patients either influence staff performance positively or negatively (Farr & Cressey, 2015).

5.4.3.2 Participants' institutions and participants' duration of service (months)

In addition, as the duration of service **(**months) increased in both institutions, there was also a steady increase in knowledge for clinicians to screen DDs in children under the age of five years age. However, being a clinician with 200 months in service at Maina Soko Military Hospital and being clinician with 200 months of service at Matero Level One Hospital, the probability for the clinician from Maina Soko Military to have the knowledge to screen DDs in children under the age five years age was higher (0.37, 95% CI = [0.14-71]; p = 0.04) than the probability for the clinician from Matero Level One Hospital to have the knowledge to screen DDs in children under the age five years age (0.31, 95% CI = [0.03-0.59]; p = 0.03). This suggested that the environment a clinician worked from, played a part in their performance. The finding was similar to the result for a study conducted in Malaysia which assessed newly graduates' knowledge in screening DDs and revealed clinicians' ambiguity of their role in the identification of DDs (Moyle et al., 2010).

The finding is further in conformity with a South African study that sought to discover and describe nurses' working experience with a critical shortage of medical equipment which discovered that lack of medical instruments negatively affected nurses and the health facility's healthcare provision (Moyimane et al., 2017). Therefore, the findings support the argument that the clinicians' institution may influence clinicians' knowledge to use DDs screening instruments. The finding further back the argument that clinicians' delivery of quality healthcare services is enhanced by staff principles, inspiration, behaviour and their relationship with the patients (Farr & Cressey, 2015).

5.4.3.3 Duration of service and knowledge to screen DDs and age of participants

When the association between participants' age and participants' duration of service (months) was done, the study found that there was a positive significant colouration between participants age and duration of service (months) $P<0.001$, $r=0.801$. As participants' age increased, participants' duration of service also increased. This could be because there was a set age limit for professional training which made people be in employment at almost the same age range. The study results are similar to the disclosure by the Organization for Economic Cooperation and Development (2020) that in defining employment rate for a particular age cluster, duration of service corresponds with the age of the employee.

Furthermore, the probability of the participant to have knowledge to screen DDs in children under the age of five years age reduced as one advanced in age. As earlier indicated, this could be due to a lack of exposure to current nursing roles. A Rwandan study testified that nurses who received mentorship adherence to treatment guidelines due to knowledge gained (Ndayisaba et al., 2017). The current findings are comparable to the study findings by Southern et al. (2011) who showed that patients attended by physicians with a high duration of service stayed longer in health facilities and had an increased risk of mortality compared to those attended by physicians less than twenty (20) years of service. According to Dellinger et al. (2017), the average knowledge capacity reduces by more than 20% by the ages between 40 and 70 years of life and this may negatively affect the physicians' service delivery.

5.4.3.4 *Duration of service and Knowledge to screen DDs and participants' awareness of children under the age of five years at risk of having DDs*

In terms of risk awareness, the study findings showed that for every 1unit increase (years) there was 1 per cent less likely for the participant to be aware of children under the age of five years age at risk of having DDs (AOR= 1.00, 95% CI= [0.92, 1.08]; p = 0.918). The study findings also showed that every 1unit increase in the duration of service (months) was associated with 1.01 % unlikely to be aware of under-five children at risk of having DDs (AOR=1.01, 95% CI= [0.99, 1.01]; p=0.142). Lack of continuous professional development and or supervision, and limited exposure to current information in relation to role identification may have caused clinicians who are advanced in age and with long duration of service (months) to lack awareness of children under the age of five years age, at risk of having DDs. A Tanzanian study revealed that clear role assignment and adequate supervision promotes clinical practice competence in students nurses (Gemuhay et al., 2019). Additionally, personal work competence in older persons does not improve with the duration of service but with logical reasoning (Chung et al., 2015).

5.4.3.5 Profession and duration of service (months), and participants' awareness of children under the age of five years at risk of having DDs

Profession and duration of service (months), and participants' awareness of children under the age five years age, at risk of having DDs showed that although nurses work with both the doctors and the Clinical Officers, the nurses may have performed in close range with clinical officers because most of the time they attend to patients with clinical officers. A study conducted in the USA to assess the effect of inter-professional edification disclosed that there was an improvement in knowledge for clinicians who work and collaborate (Zamjahn et al., 2018). Similarly, a study done in Ghana, Mozambique, Rwanda, Tanzania and Zambia highlighted that mentorship and coaching services improve clinicians' knowledge and clinical skills (Manzi et al., 2017). The

findings are similar to a Nigerian study which revealed that showed that medical students' knowledge, attitude and perceptions about epilepsy was higher in clinical students than in medical students since clinical students were exposed to epilepsy (Ekeh & Ekrikpo, 2015). Clinicians' attitude concerning uniform screening and worthiness of diagnosis in planning management revealed that generally, clinicians were willing to use standardised screening instruments (Danielson et al, 2019). Therefore, systems for mentorship and coaching of clinicians should be strengthened in health care institutions to promote the uniform provision of health care services.

Analysis of these factors suggested that understanding which factors were most strongly associated with increased risk of disability could provide us with additional information about where to target interventions to prevent future cases of missing children with disabilities and support the inclusion of children with disabilities.

5.5 Conclusion

A total of 88 clinicians from the two selected hospitals participated in the study. The study discovered that 40.9% of clinicians were aware of under-five children at risk of having DDs while 30.7 per cent had the knowledge to screen DDs in children under the age of five years. Therefore, the study revealed that clinicians lacked both awareness of children under the age of five years age at risk of having DDs and knowledge to screen DDs in under-five children. The identification of children with or at risk for disability is an issue of key importance in Zambia. Identifying these children will help allocate scarce resources effectively. Despite this acknowledged responsibility, as well as research documenting that valid and well-standardised tools exist for the screening and diagnosis of DDs, the study has shown that most clinicians do not routinely conduct

developmental screenings. This might lead to under-detecting significant DDs. Hence supporting claims by Urkin, Bar-David, & Porter (2015), that Clinicians' knowledge to identify children with mild and moderate DDs can enable children to receive quality care and limited resources will be channelled to early interventional programmes. It is also evident that the clinicians are committed to delivering high-quality care to their patients, however, multiple systemic problems contribute to poor compliance and detection. The study agrees that screening instruments developed and used so far have had limitations in terms of key issues relevant to LAMI countries. There needs to be a tool that will promote relationships between care providers and caregivers at the community level. This will drive the process of identification as well as link it to interventions.

5.6 Strengths and limitations

The main strength is that the study points to the importance of the use of standardised and simple tools in screening DDs, the need for refresher courses and emphasis in curricula and recommends strategies to address these issues as a means of helping clinicians overcome the challenges. In addition, the research participants were drawn from two different institutions which helped to assess whether the workplace affected the participants' knowledge to screen DDs in children under the age of five years. The study yielded some new information which added to the board of scientific knowledge. Despite the study being conducted from only two hospitals in the city, it had revealed the gaps in training needs for clinicians. Although the primary interest of this study was to investigate the clinicians' knowledge to screen DDs in children under the age of five years, this study included a comparison with age, duration of service and awareness of risks from the participants. To the best knowledge of the researcher, there have been no

other studies in Zambia identified that considered such an approach. Being the first study in Zambia to assess clinicians' knowledge to screen children under the age of five years for DDs, therefore, the study generated information that can be used by policy makers to formulate policies that can promote clinicians' ability to screen all under-five children for DDs.

The study limitations were that the study did not gather data that could have assessed the practical aspect of participants to compare with the theoretical knowledge for participants. The findings could not be generalised because the sample size was small. The relatively small sample size and the diversity of the hospitals involved could constitute important limitations to this study. These features of the study design were a consequence of conducting a thesis linked study. However, larger, separate studies across the country need to be conducted to further verify the results presented here.

5.7 Public implication

Principally clinicians stand a better chance to screen children for DDs (Ertem & WHO, 2012)their lack of awareness of children under the age of five years of having DDs and their lack of knowledge to use the DD screening instrument could make children who could have been identified with either mild or moderate DDs be lost in the system (Naidoo et al., 2019). The children with DDs will not attain full life perspective and may not effectively contribute to the development of the nation because they have difficulties accessing education and employment. This further makes the affected persons prone to poverty and subsequently face ill-health which will make the government spend more resources to promote their health. Consequently, the national

development will be negatively affected as the government resources will be directed towards the care of the disabled and or poor people.

5.8 Recommendations

The following recommendations have been made based on the study findings:

Training

1. During training, all student clinicians should be trained to screen for DDs in children and practice screening for DDs in children during their clinical allocation.
2. Clinicians should be provided with knowledge on the use of the tools for screening children before they are recommended to use them.

Clinical practice

1. Clinicians should be provided with a tool use when screening children to promote quality of services provision.
2. Mentorship to qualified clinicians should be continuous to promote continuous professional development, especially in new clinical guidelines.

Policy

4. Culturally acceptable instruments for screening children for DDs should be made available for clinicians to use.

Research

1. There is a need to conduct a similar study using the mixed method to assess the ability of clinicians to screen DDs in children using culturally acceptable screening instruments.
2. There is also a need to evaluate the curricula content for clinicians and their role assignments.

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APPENDIXES

Appendix 1: Information sheet

Title of study

Assessing the capacity of the clinicians to screen children for developmental disabilities at selected hospitals in Lusaka District

Investigator

My name is Mutinta F. Hatontola Kasaro. I am a Zambian working at Lusaka College of Nursing, at the University Teaching Hospital.

Background and rationale for the Study

I am studying at the University of Malawi (Kamuzu College of Nursing) pursuing a Master of Science degree in Child Health. In partial fulfilment of my study, I am conducting a research project on "Assessing the capacity of the clinicians to screen children for developmental disabilities at selected hospitals in Lusaka District".

Purpose, procedure and participation

I request you to take part in the above-stated research. You have been selected to take part in this study because of your involvement in the provision of health care services for children. The interview for all the 108 participants selected will be on one basis and will take about 30 minutes for each participant. You**r** participation in this study is purely voluntary. You are free to decide whether to take part or not. Your choice either to take part or not will not affect your job. Furthermore, even if you have agreed to take part, you can still draw at any time.

No extra cost will be incurred by participating in the study. There is also no compensation for participating in the study.

Risks

The study has no likely risks. However, in case of any harm, you will be counselled and /or you can forward your grievance to the researcher at Lusaka College of Nursing.

Benefits

The study findings may help policymakers when making policies concerning child care.

Confidentiality

Confidentiality will be maintained by not sharing the information with anybody besides the research members. Privacy will be ensured by conducting the interview in a private room and using numbers instead of names. Only the investigator will know your number. The information collected will be locked in a filing cabinet while the computer record will be secured with a password so that it will only be accessed by the researcher.

The study results will be shared through presentations at Kamuzu College of Nursing, College of Medicine research committee, and University of Zambia Biomedical Research Committee. A copy of the results will be presented to National Health Research Authority in Zambia, Coptic Orthodox Church and Hospital, Maina Soko Military Hospital, and Matero Government Hospital. Thereafter the results will be published in Nursing journals for others to access the information.

This study document was approved by the Malawi College of Medicine Research Committee (COMREC) and the University of Zambia Biomedical Research Ethics Committee (UNZA- BREC). The two committees ensure that research participants are protected from any harm. For any inquiries, you can contact:

Mutinta F.H. Kasaro,
University Teaching Hospital,
Lusaka School of Nursing,
P.O. Box 50366,
Lusaka
Zambia.
Phone Numbers: +260955591655
+260977353198
Email: Kasaro2017mutinta@kcn.unima.mw

The Chairperson,

University of Zambia,
School of Medicine,
Ridgeway camps,
P.O Box 50110,
Lusaka,
Zambia
Phone number: +260211256067

Appendix 2: Informed Consent

I……...have been requested to participate in the research on "Assessing the capacity of clinicians to screen children aged 0-59 months for developmental disabilities at three selected hospitals in Lusaka District". The researcher has explained to me that participation is voluntary and that my rights will be preserved. The researcher has also explained to me the benefits of the study, that my refusal to participate will not affect my job in any way, and that there are no risks in participating in this study. I had the chance to enquire concerning it and any enquiries I had have been asked and have been responded to my fulfilment. I voluntarily agree to participate in the study**.** A duplicate of this consent will be given to me.

Name of participant……Signature of participant……

Date ……

Name of witness…… Signature of witness……

Date ……

Name of researcher……. Signature of researcher……

Date…….

Appendix 3: Quantitative questionnaire

Strictly confidential Serial number……...

	Section 1: Socio-Demographic Characteristics			
	I will ask you a few questions about yourself and your work. Please feel free to answer confidentiality will highly be maintained at all levels.			
	Question and filters	**Coding categories**	**Tick**	**Code**
101	How old are you?	Age in completed years……		
102	What is your gender	Male Female		
103	Address (Work place)	Maina Soko Military Hospital,		
		Matero Level One Government Hospital,		
		Coptic Orthodox Church and hospital		
104	What category of staff are you?	Nurse		
		Midwife		
		Paediatric nurse		
		Clinical officer		
		Physician		
105	What is the duration of your service?	Completed period in months		
Section 2: Screening for the Developmental Disabilities in Children				
Clinicians' awareness of risks for children to have developmental disabilities				

I'm grateful for the responses above. Now I will ask you about the risks for children 0 to 59 months of age to have developmental disabilities. Kindly indicate your answer by telling me whether you strongly agree, agree, disagree or strongly disagree with the statement below. Your input will be highly appreciated.						
	Gem	**Strongly agree**	**Agree**	**Disagree**	**Strongly disagree**	**Code**
201	All children who are exposed to toxic materials are at risk of developmental disabilities.					
202	The child's health status has no impact on the child's achievement of developmental milestones					
203	The baby's gestational age at birth determines the need for follow up					
204	The baby's birth weight has no impact on the baby's development					

205	All neonates with disease or disorder of the brain risk having developmental disabilities					
206	Conditions that affect the central nervous system in children can cause developmental disabilities					
207	Neonates identified with neuro disorders are at risk of developmental disabilities					
208	The health status of the child's parents cannot risk the child having a developmental disability.					
209	Children whose parent/parents abuse substances are at risk of developmental disabilities					

210	Children with genetic disorders are not at risk of developmental disabilities					
Thank you, you are performing well						
Section 3: I will now ask you questions about the screening of under-five children for developmental disabilities. Please feel free to express yourself so that I get what you think. All answers are cherished. Once more indicate your answer by telling me whether you strongly agree, agree, disagree or strongly disagree with the statement below						
	Gem	**Strongly agree**	**Agree**	**Disagree**	**Strongly disagree**	**Code**
301	As a child health care provider, using interview and observational skill I can screen for developmental disabilities in under-five children.					
302	As a clinician, I have the knowledge and skills to use standardized validated tools to screen for					

	developmental disability in Children 0-59 months of age independently.					
303	Equated with other children of the same age, not all children who experience challenges in sitting, standing or ambulation can be said to have a developmental disability.					
304	A child who has problems with seeing either during day time or during night time can be said to have a developmental disability					
305	A Child who seems to have difficulties in hearing may be at risk of developmental disability					

306	A child's inability to understand what one is saying is not a sign of child developmental disability					
307	When screening the child for developmental disabilities, it is not necessary to ask if the child walks or moves his/ her upper limbs or if the child has feebleness or stiffness of either the upper or lower limbs.					
308	Screening for developmental disabilities does not include the history of whether the child fits or loses consciousness at times.					
309	While screening a child for developmental					

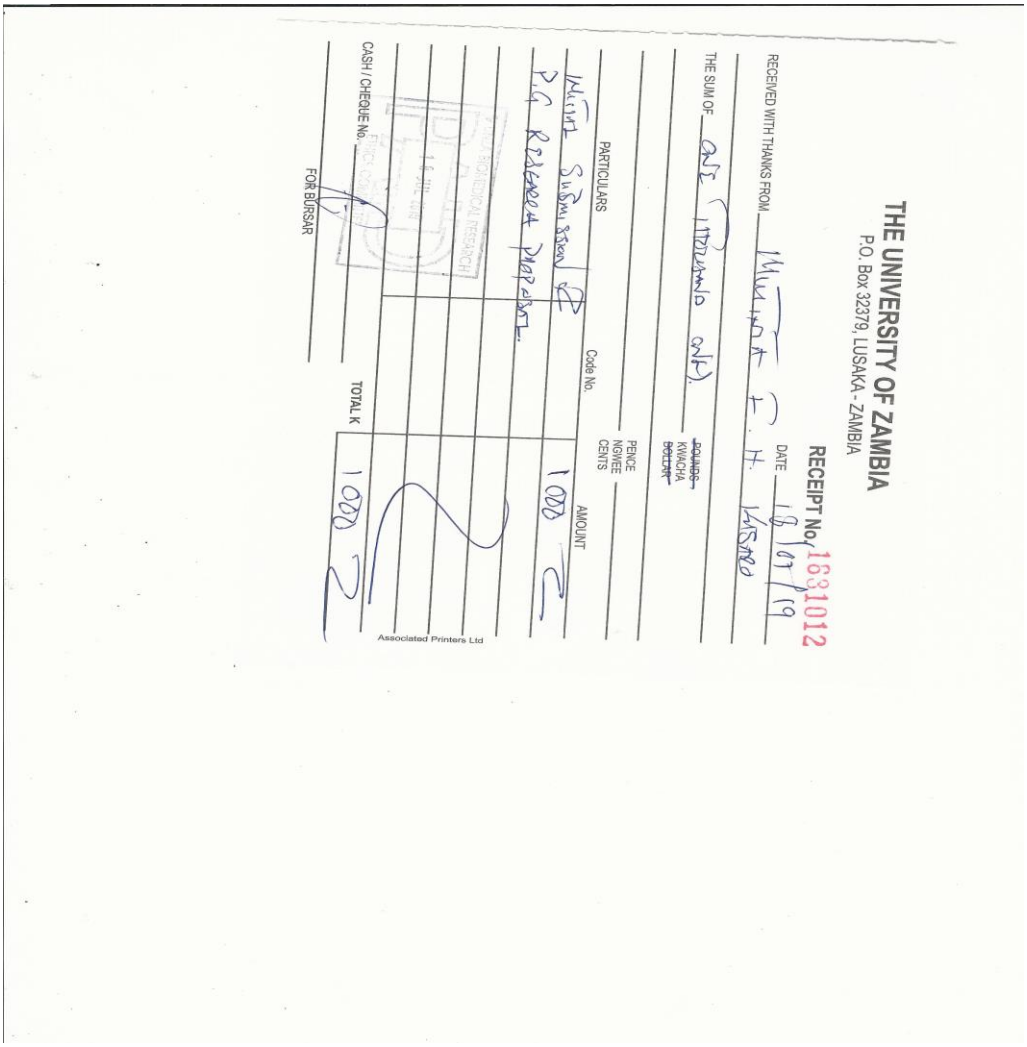
	disabilities, it is appropriate to inquire whether the child acquires the ability to perform more activities than children of his/her age.					
310	When screening children for development, one can ask and/or listen whether the child can speak and/ or can accurately make speeches.					
311	Child developmental assessment includes probing to find out if the child's speech is different in any way					
312	Inability to name one or more objects such as toys, animals, or cup among others at age above 2 years does not					

	signify a developmental disability in children					
313	The child's appearance is not associated with his/her mental well-being					
314	A child showing any behavioural problem, such some frequent tantrums, aggressive behaviour, or difficulty relating to people have developmental disabilities					
Thank you for completing this section.						
You have reached the end of the questionnaire. Do you have any question or concern? Thank you very much for your time and for participating in the survey.						

Appendix 4: Payment and compensation

Participation in this study will purely be voluntary. Participants will be recruited and interviewed while on duty. Further still, participants will not incur any cost as a result of participating in the study. Therefore, there will be no payment or compensation

Appendix 5: Receipt for proof of payment to the University of Zambia



THE UNIVERSITY OF ZAMBIA
P.O. Box 32379, LUSAKA - ZAMBIA

RECEIPT No. 1631012

DATE 18/07/19

RECEIVED WITH THANKS FROM [illegible]

THE SUM OF [illegible]

KWACHA / NGWEE / POUNDS / PENCE

PARTICULARS

Code No.

AMOUNT

TOTAL K 1000 2

CASH / CHEQUE No.

FOR BURSAR

Associated Printers Ltd

Appendix 6: Permission to conduct a study at Maina Soko Military Hospital

0

MAINA SOKO MILITARY HOSPITAL

P O BOX 320091
Woodlands
Lusaka-Zambia

Tel: 260-1-260301/4
Fax: 260-1-261208
E-mail: msmh@zamnet.zm

MSMH/A 151/9/1

Mrs Mutinta F Hatontola Kasaro
University Teaching Hospital
Lusaka University College of Nursing
P O Box 50366,
LUSAKA

05 April 2018

Dear Sir/Madam,

REQUEST FOR STAFF STATISTICS FOR YOUR RESEARCH

1. Reference is made to your letter dated 26 March 2018 on the subject matter.

2. Authority has been granted for you to collect statistical information at this institution specifically for your academic Research only.

3. Management would like to wish you success in your research and the entire academic process.

4. For your consideration.

Yours faithfully,

E MTOLO, *MPH BSc PHS Dip DT Cert M & Dev*
Major
for Commandant

Appendix 7: Permission to conduct a study in Lusaka District

P. O. Box 50827
Lusaka
Tel: +260-211-235554
Fax: +260-211-238429

In reply please quote
No. ...

REPUBLIC OF ZAMBIA

MINISTRY OF HEALTH
LUSAKA DISTRICT HEALTH OFFICE

11th February, 2019

Mutinta F. Hatontola Kasaro (Ms)
University of Malawi
Kamuzu College
P. O. Box 415
Blantyre

Dear Ms. Kasaro,

RE: AUTHORITY TO COLLECT DATA IN LUSAKA DISTRICT

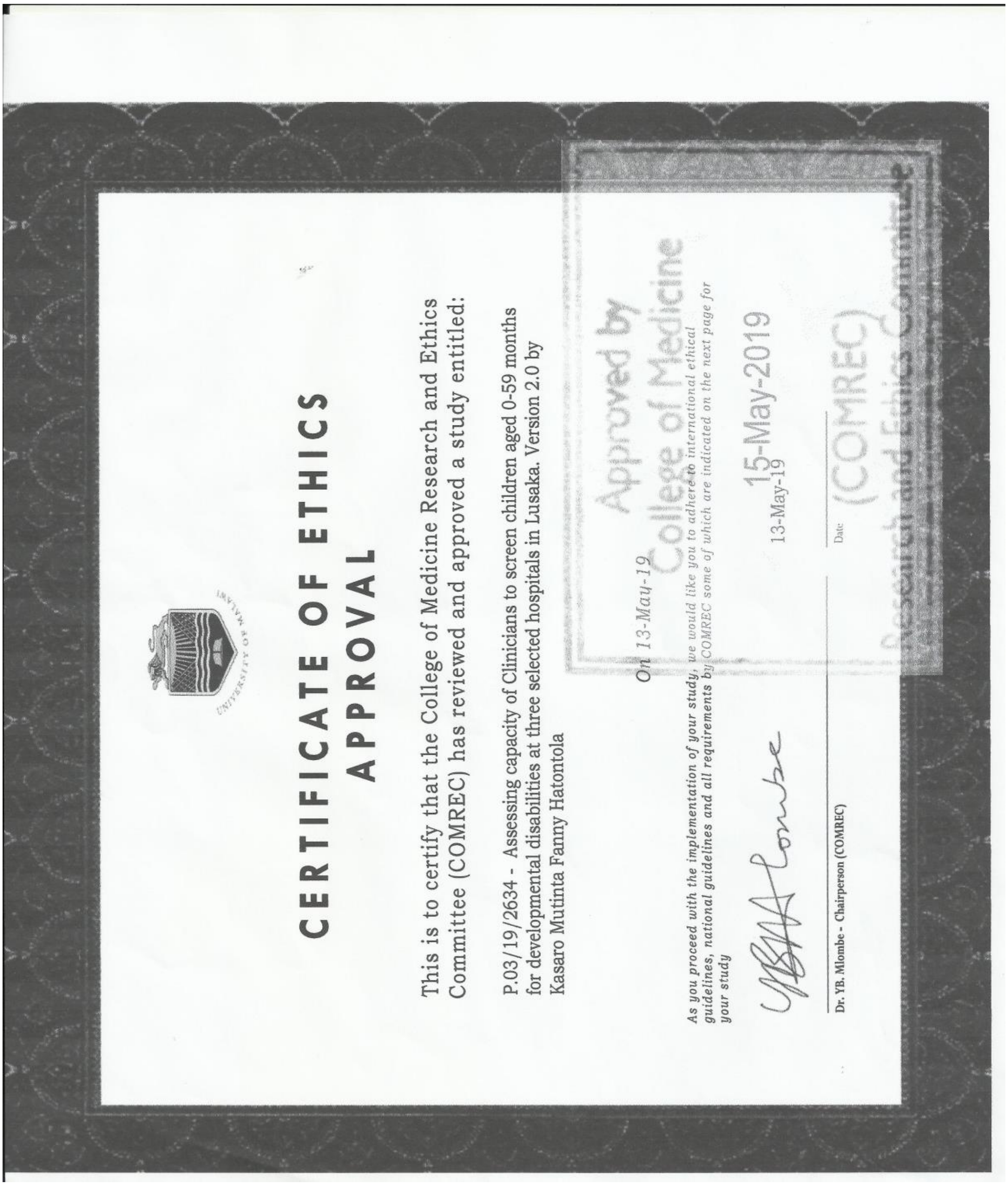
We are in receipt of your letter over the above subject.

Please be informed that Lusaka District Health Office has no objection for you to conduct a research study on **"Capacity of clinicians to screen children aged 0-59 months for developmental disabilities at three selected hospitals in Lusaka District".** However this is subject to you obtaining Ethics Approval and National Health Research Authority clearance.

Yours sincerely

Dr. C. Mbwili-Muleya
PRINCIPAL CLINICAL CARE OFFICER
For/DISTRICT HEALTH DIRECTOR

Appendix 8: COMREC Certificate of ethics approval



UNIVERSITY OF MALAWI

CERTIFICATE OF ETHICS APPROVAL

This is to certify that the College of Medicine Research and Ethics Committee (COMREC) has reviewed and approved a study entitled:

P.03/19/2634 - Assessing capacity of Clinicians to screen children aged 0-59 months for developmental disabilities at three selected hospitals in Lusaka. Version 2.0 by Kasaro Mutinta Fanny Hatontola

On 13-May-19

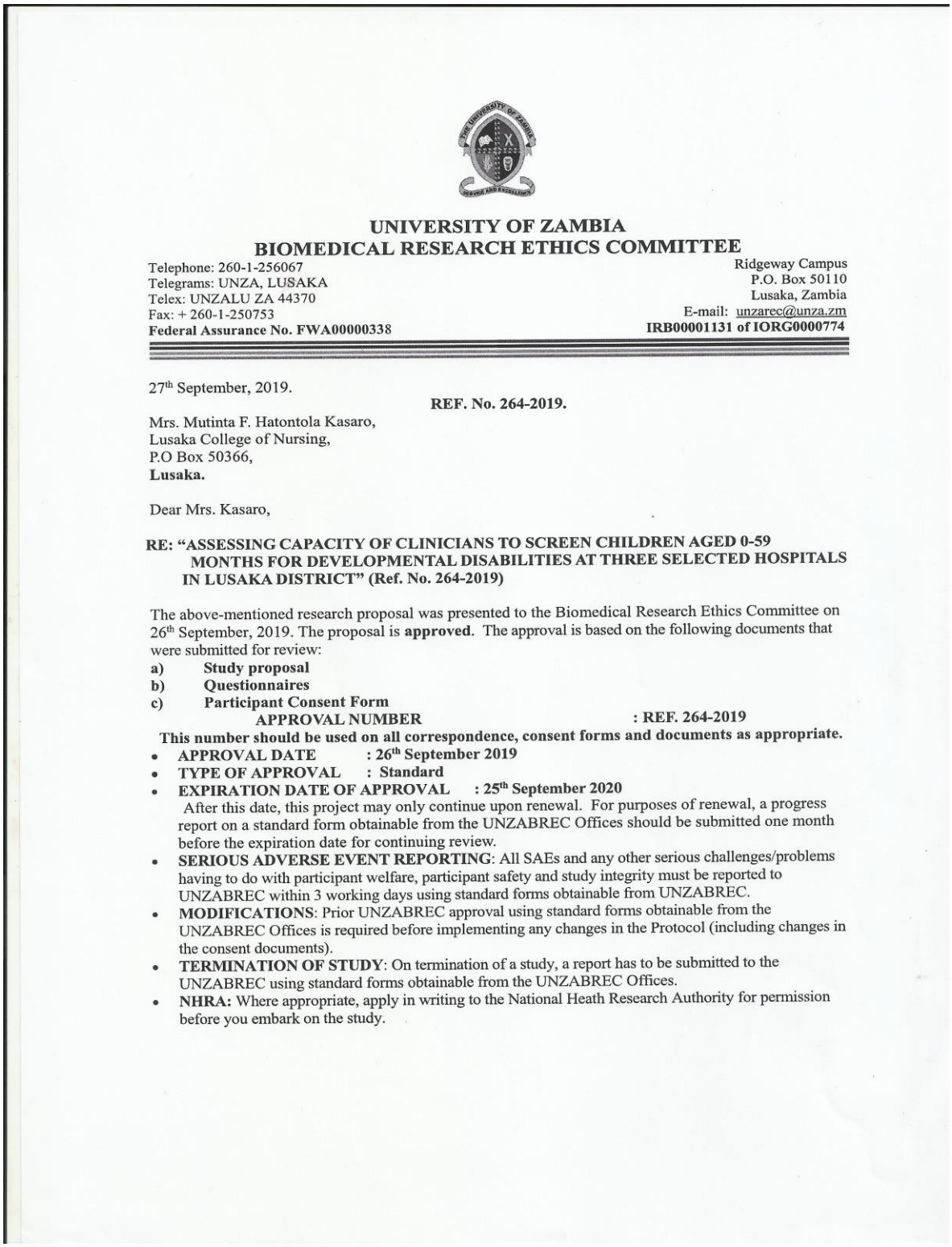
As you proceed with the implementation of your study, we would like you to adhere to international ethical guidelines, national guidelines and all requirements by COMREC some of which are indicated on the next page for your study

Dr. YB. Mlombe - Chairperson (COMREC)

Date: 13-May-19

Approved by College of Medicine 15-May-2019 Research and Ethics Committee (COMREC)

Appendix 9: UNZABREC certificate of ethics approval



UNIVERSITY OF ZAMBIA
BIOMEDICAL RESEARCH ETHICS COMMITTEE

Telephone: 260-1-256067
Telegrams: UNZA, LUSAKA
Telex: UNZALU ZA 44370
Fax: + 260-1-250753
Federal Assurance No. FWA00000338

Ridgeway Campus
P.O. Box 50110
Lusaka, Zambia
E-mail: unzarec@unza.zm
IRB00001131 of IORG0000774

27th September, 2019.

REF. No. 264-2019.

Mrs. Mutinta F. Hatontola Kasaro,
Lusaka College of Nursing,
P.O Box 50366,
Lusaka.

Dear Mrs. Kasaro,

RE: "ASSESSING CAPACITY OF CLINICIANS TO SCREEN CHILDREN AGED 0-59 MONTHS FOR DEVELOPMENTAL DISABILITIES AT THREE SELECTED HOSPITALS IN LUSAKA DISTRICT" (Ref. No. 264-2019)

The above-mentioned research proposal was presented to the Biomedical Research Ethics Committee on 26th September, 2019. The proposal is **approved**. The approval is based on the following documents that were submitted for review:

a) **Study proposal**
b) **Questionnaires**
c) **Participant Consent Form**

APPROVAL NUMBER : REF. 264-2019

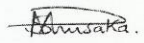
This number should be used on all correspondence, consent forms and documents as appropriate.

- **APPROVAL DATE : 26th September 2019**
- **TYPE OF APPROVAL : Standard**
- **EXPIRATION DATE OF APPROVAL : 25th September 2020**
  After this date, this project may only continue upon renewal. For purposes of renewal, a progress report on a standard form obtainable from the UNZABREC Offices should be submitted one month before the expiration date for continuing review.
- **SERIOUS ADVERSE EVENT REPORTING**: All SAEs and any other serious challenges/problems having to do with participant welfare, participant safety and study integrity must be reported to UNZABREC within 3 working days using standard forms obtainable from UNZABREC.
- **MODIFICATIONS**: Prior UNZABREC approval using standard forms obtainable from the UNZABREC Offices is required before implementing any changes in the Protocol (including changes in the consent documents).
- **TERMINATION OF STUDY**: On termination of a study, a report has to be submitted to the UNZABREC using standard forms obtainable from the UNZABREC Offices.
- **NHRA:** Where appropriate, apply in writing to the National Heath Research Authority for permission before you embark on the study.

EC

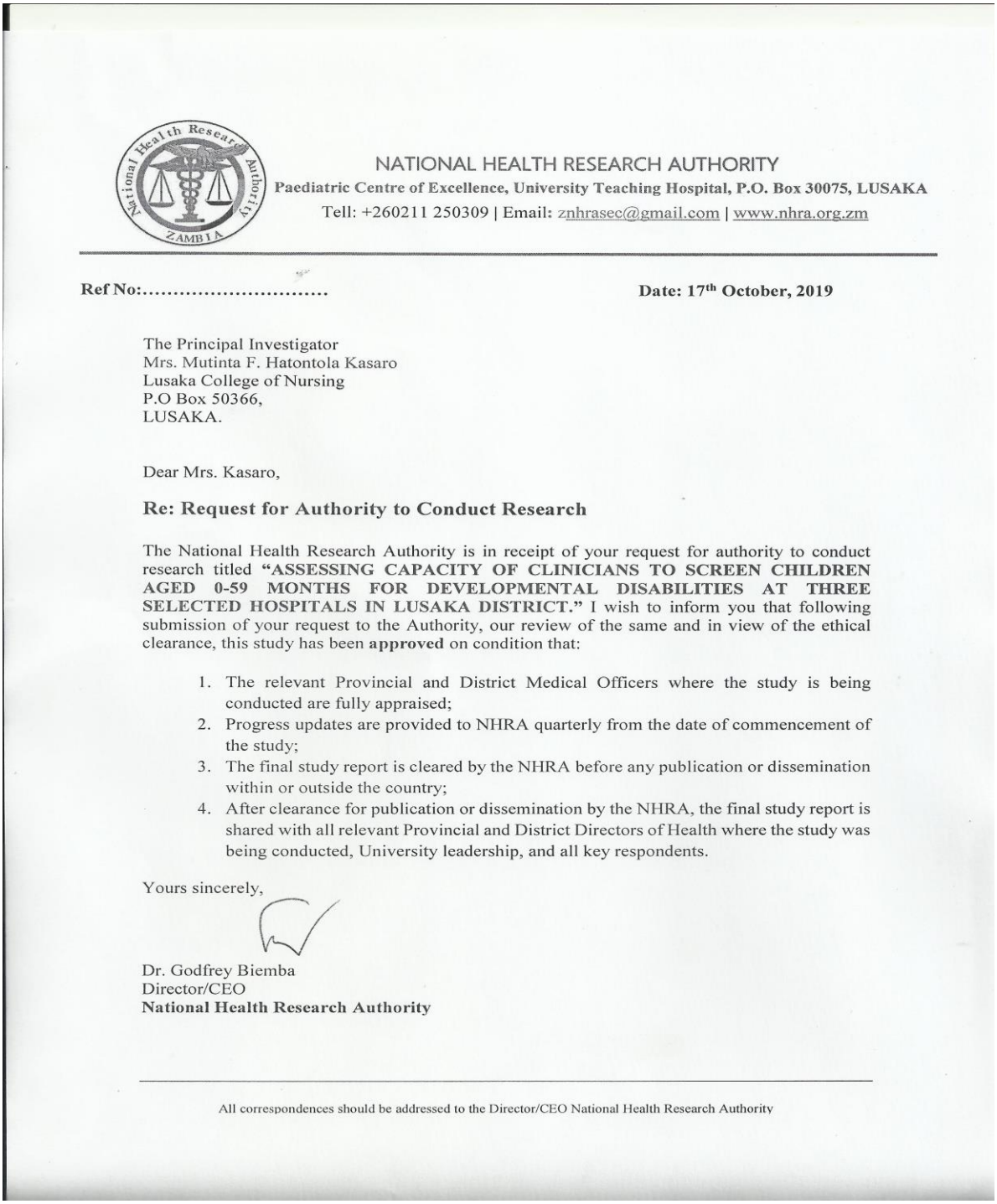
- **QUESTIONS**: Please contact the UNZABREC on Telephone No.256067 or by e-mail on unzarec@unza.zm.
- **OTHER**: Please be reminded to send in copies of your research findings/results for our records. You're also required to submit electronic copies of your publications in peer-reviewed journals that may emanate from this study. Use the online portal: unza.rhinno.net for further submissions.

Yours sincerely,



Sody Mweetwa Munsaka, BSc., MSc., PhD
CHAIRPERSON
Tel: +260977925304
E-mail: s.munsaka@unza.zm

Appendix 10: National Health Research Authority



NATIONAL HEALTH RESEARCH AUTHORITY
Paediatric Centre of Excellence, University Teaching Hospital, P.O. Box 30075, LUSAKA
Tell: +260211 250309 | Email: znhrasec@gmail.com | www.nhra.org.zm

Ref No:..... **Date: 17th October, 2019**

The Principal Investigator
Mrs. Mutinta F. Hatontola Kasaro
Lusaka College of Nursing
P.O Box 50366,
LUSAKA.

Dear Mrs. Kasaro,

Re: Request for Authority to Conduct Research

The National Health Research Authority is in receipt of your request for authority to conduct research titled **"ASSESSING CAPACITY OF CLINICIANS TO SCREEN CHILDREN AGED 0-59 MONTHS FOR DEVELOPMENTAL DISABILITIES AT THREE SELECTED HOSPITALS IN LUSAKA DISTRICT."** I wish to inform you that following submission of your request to the Authority, our review of the same and in view of the ethical clearance, this study has been **approved** on condition that:

1. The relevant Provincial and District Medical Officers where the study is being conducted are fully appraised;
2. Progress updates are provided to NHRA quarterly from the date of commencement of the study;
3. The final study report is cleared by the NHRA before any publication or dissemination within or outside the country;
4. After clearance for publication or dissemination by the NHRA, the final study report is shared with all relevant Provincial and District Directors of Health where the study was being conducted, University leadership, and all key respondents.

Yours sincerely,

Dr. Godfrey Biemba
Director/CEO
National Health Research Authority

All correspondences should be addressed to the Director/CEO National Health Research Authority

Appendix 11: Authority to conduct data at Chilenge Hospital

All correspondence should be Addressed to the District

Health Director

In reply please quote
No:.....

Tel: +260-211-235554
Fax: +260-211236429

REPUBLIC OF ZAMBIA
MINISTRY OF HEALTH

LUSAKA DISTRICT HEALTH OFFICE
P.O. BOX 50827
LUSAKA

REPUBLIC OF ZAMBIA
MINISTRY OF HEALTH
30 OCT 2019
CHILENJE LEVEL ONE HOSPITAL
MEDICAL OFFICER IN-CHARGE
P.O. BOX 50827, LUSAKA.

Monday, October 28, 2019.

Mutinta F. H. Kasaro (Mrs)
University of Malawi
Kamuzungu College of Nursing
BLANTAYRE.

Dear Mrs. Kasaro,

RE: AUTHORITY TO CONDUCT DATA COLLECTION AT CHILENJE AND MATERO FIRST LEVEL HOSPITALS.

Lusaka District Health Office is in receipt of your letter, in which you requested for permission to be granted you studenti to undertake Data collection in clinical medicine.

Be informed that Management has granted you permission to go ahead and collect data on **"Assessing Capacity of Clinicians to screen children aged 0-59 months for developmental disabilities at two selected hospitals in Lusaka District",** for academic purposes.

Kindly ensure that you cooperates with the Medical Siperintendents and In-charges of the Facilities, and after completion, your findings are to be shared with the Health facilities and District Health Office.

By copy of this letter, the Medical Siperintendents and In-charges for facilities are kindly requested to facilitate accordingly.

Yours sincerely,

SENIOR CLINICAL CARE OFFICER
P.O.BOX 50827
LUSAKA,ZAMBIA
28 OCT 2019
REPUBLIC OF ZAMBIA
MINISTRY OF HEALTH
LUSAKA DISTRICT HEALTH OFFICE

Dr. Richard Mwila
Senior Clinical Care Officer
For/District Health Director
LUSAKA DISTRICT HEALTH OFFICE.

c.c.: Medical Siperintendents and In-charges for Chilenje and Matero 1st Level Hospitals.
c.c.: Public Health Specialist for the facilities – Chilenje and Matero 1st Level Hospitals.

Appendix 12: Authority to conduct data at Matero Level One Hospital

All correspondence should be Addressed to the District

Health Director

In reply please quote
No:.....

Tel: +260-211-235554
Fax: +260-211236429

REPUBLIC OF ZAMBIA
MINISTRY OF HEALTH

LUSAKA DISTRICT HEALTH OFFICE
P.O. BOX 50827
LUSAKA

Monday, October 28, 2019.

Mutinta F. H. Kasaro (Mrs)
University of Malawi
Kamuzu College of Nursing
BLANTYRE.

REPUBLIC OF ZAMBIA
MINISTRY OF HEALTH
01 NOV 2019
MATERO LEVEL1 HOSPITAL
MEDICAL SUPERINTENDENT
P.O.BOX 50827, LUSAKA

Dear Mrs. Kasaro,

RE: AUTHORITY TO CONDUCT DATA COLLECTION AT CHILENJE AND MATERO FIRST LEVEL HOSPITALS.

Lusaka District Health Office is in receipt of your letter, in which you requested for permission to be granted you student to undertake Data collection in clinical medicine.

Be informed that Management has granted you permission to go ahead and collect data on **"Assessing Capacity of Clinicians to screen children aged 0-59 months for developmental disabilities at two selected hospitals in Lusaka District",** for academic purposes.

Kindly ensure that you cooperates with the Medical Siperintendents and In-charges of the Facilities, and after completion, your findings are to be shared with the Health facilities and District Health Office.

By copy of this letter, the Medical Siperintendents and In-charges for facilities are kindly requested to facilitate accordingly.

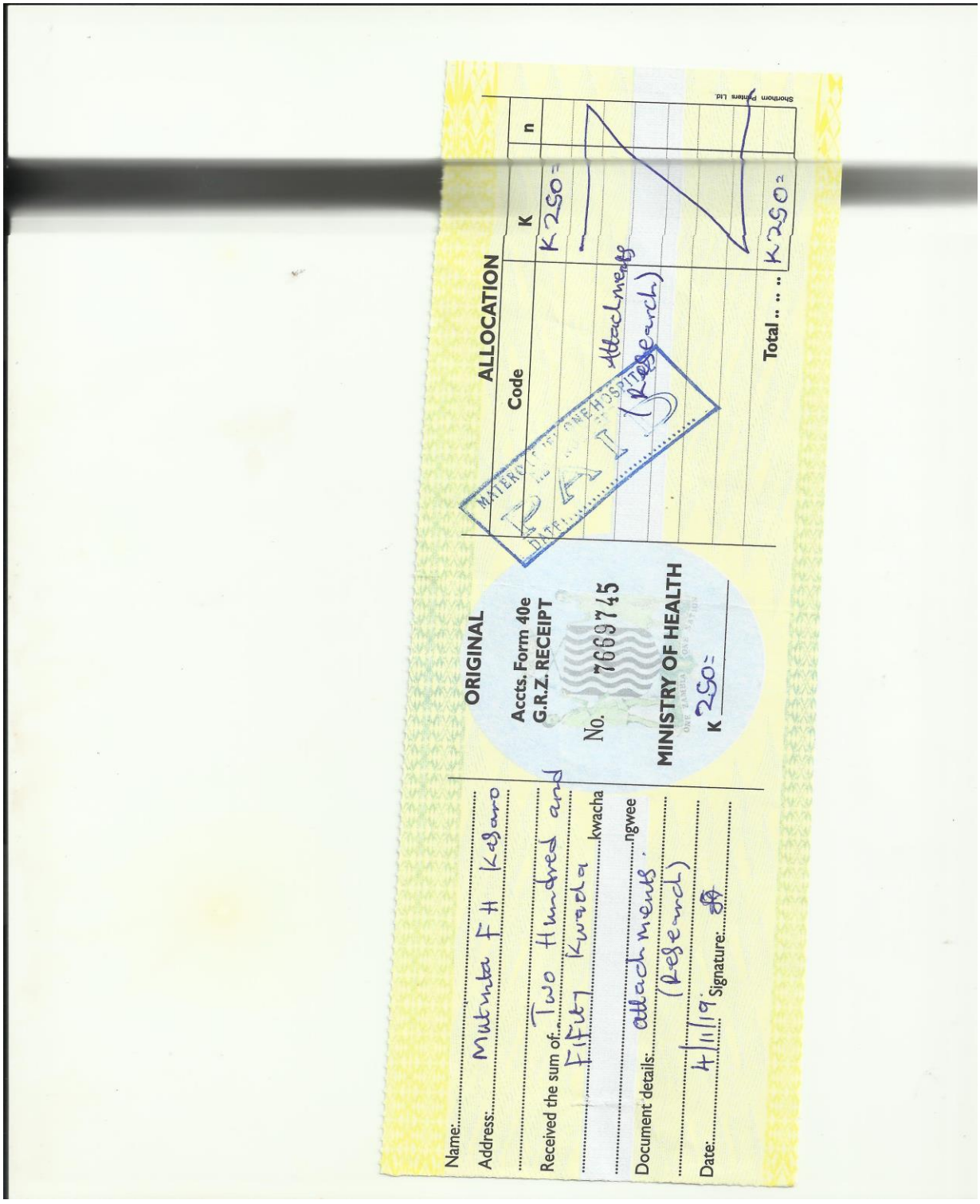
REPUBLIC OF ZAMBIA
MINISTRY OF HEALTH
LUSAKA DISTRICT HEALTH OFFICE
01 NOV 2019
SENIOR CLINICAL CARE OFFICER
P.O.BOX 50827
LUSAKA,ZAMBIA

Yours sincerely,

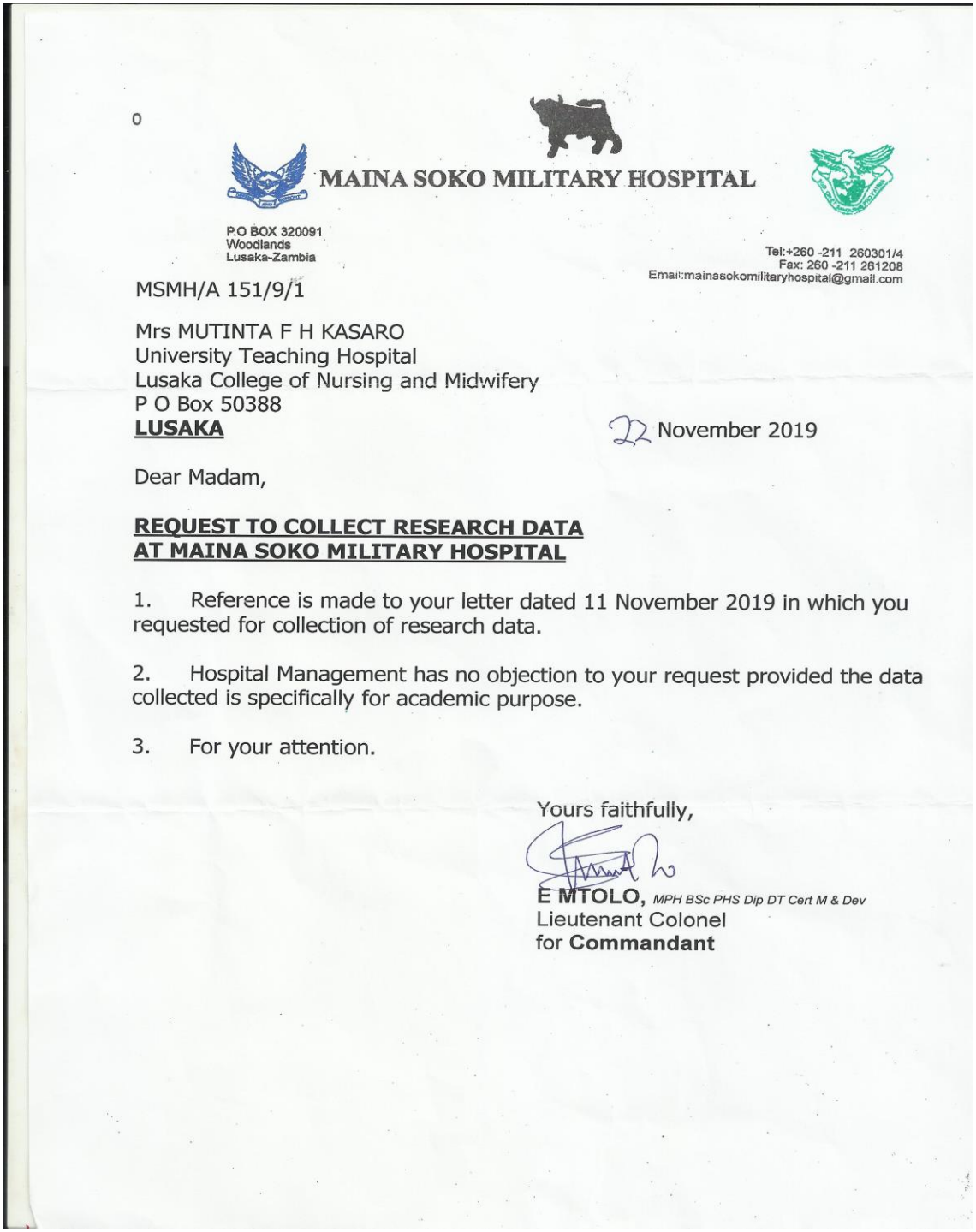
Dr. Richard Mwila
Senior Clinical Care Officer
For/District Health Director
LUSAKA DISTRICT HEALTH OFFICE.

c.c.: Medical Siperintendents and In-charges for Chilenje and Matero 1st Level Hospitals.
c.c.: Public Health Specialist for the facilities – Chilenje and Matero 1st Level Hospitals.

Appendix 13: Proof of payment for attachment at Matero Level One hospital



Appendix 14: Authority to conduct data collection at Maina Soko Military Hospital



0

MAINA SOKO MILITARY HOSPITAL

P.O BOX 320091
Woodlands
Lusaka-Zambia

Tel:+260 -211 260301/4
Fax: 260 -211 261208
Email:mainasokomilitaryhospital@gmail.com

MSMH/A 151/9/1

Mrs MUTINTA F H KASARO
University Teaching Hospital
Lusaka College of Nursing and Midwifery
P O Box 50388
LUSAKA

22 November 2019

Dear Madam,

REQUEST TO COLLECT RESEARCH DATA AT MAINA SOKO MILITARY HOSPITAL

1. Reference is made to your letter dated 11 November 2019 in which you requested for collection of research data.

2. Hospital Management has no objection to your request provided the data collected is specifically for academic purpose.

3. For your attention.

Yours faithfully,

E MTOLO, *MPH BSc PHS Dip DT Cert M & Dev*
Lieutenant Colonel
for **Commandant**

Appendix 15: Extension of the study period

UNIVERSITY OF ZAMBIA
BIOMEDICAL RESEARCH ETHICS COMMITTEE

Telephone: 260-1-256067
Telegrams: UNZA, LUSAKA
Telex: UNZALU ZA 44370
Fax: + 260-1-250753
Federal Assurance No. FWA00000338

Ridgeway Campus
P.O. Box 50110
Lusaka, Zambia
E-mail: unzarec@unza.zm
IRB00001131 of IORG0000774

4th March, 2021.

Your Ref: 264-2019.

Ms. Mutinta Fanny Hatontola Kasaro,
University Teaching Hospitals,
Lusaka College of Nursing,
P.O Box 50366,
Lusaka.

Dear Ms. Kasaro,

RE: REQUEST FOR EXTENSION FOR THE STUDY: "ASSESSING CLINICIANS' KNOWLEDGE TO SCREEN UNDER FIVE CHILDREN FOR DEVELOPMENTAL DISABILITIES AT TWO SELECTED HOSPITALS IN LUSAKA DISTRICT, ZAMBIA" (REF. No. 264-2019)

We acknowledge receipt of your request for study extension and the enclosed progress report therewith.

Renewal is hereby approved for a one year period from 27th September 2020 to 26th September, 2021.

Yours sincerely,

Sody Mweetwa Munsaka, BSc., MSc., PhD
CHAIRPERSON
Tel: +260977925304
E-mail: s.munsaka@unza.zm