

**Fathers' and Grandmothers' Involvement in Child- Rearing Activities and Their
Influence on the Cognitive Development in Children of Kasama and Mungwi
Districts in Zambia**

By

Kabungo John Clement

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Requirements for the Award of the Degree of Doctor of Philosophy in Educational
Psychology**

UNIVERSITY OF ZAMBIA

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DECLARATION

I, **Kabungo John Clement** do hereby solemnly declare that this Thesis is a product of my own efforts and my work except where otherwise acknowledged and that it has never been previously submitted for a degree or academic qualification at the University of Zambia or any other University. Any misrepresentation of information that would arise from this Thesis purely will be my responsibility.

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CERTIFICATE OF APPROVED

Having fulfilled the partial requirements of the Award of a Doctorate Degree, this Thesis by **Kabungo John Clement** has been approved for the award of the Degree of Doctor of Philosophy in Educational Psychology by the University of Zambia.

Examiner 1	Signature	Date
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Supervisor	Signature	Date
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ABSTRACT

Fathers and grandmothers are important in child development. They promote inner growth and strength among their children and grandchildren. This study sought to assess the fathers' and grandmothers' involvement in child-rearing activities and their influence on the cognitive development skills of children in Kasama and Mungwi districts in Zambia. The study ascertained child-rearing activities that the Zambian fathers and grandmothers were involved in. to establish the levels of fathers' and grandmothers' involvement in child-rearing activities; to determine fathers' and grandmothers' involvement levels in early childhood education practices as a child-rearing activity and how this affected cognitive development skills of children; to establish activities in child rearing activities which influenced cognitive development skills of children as well as to establish the challenges faced by fathers and grandmothers by being involved in child-rearing activities. A concurrent embedded research design utilising both quantitative and qualitative techniques was used. Structured questionnaires and child assessment tools were used to collect data including the Behaviour Rating Inventory of Executive Functioning (BRIEF), Pencil Tapping, Digit Span, Rapid Neuro Developmental Assessment tool (RNDA) and Peabody Picture Vocabulary Test (PPVT). Ten Pre-School teachers, 100 grandmothers, 100 fathers and 100 children aged from 5 to 6 years old were drawn from ten public Pre-Schools. Inferential statistics such as linear regression, t-test and Pearson were used to analyse quantitative data while qualitative data was analysed using thematic analysis. It was established that fathers and grandmothers provided nutritional food, childcare and early childhood education activities as child-rearing activities. Grandmothers were moderately involved in activities nutritional food and child care practices compared to fathers who were highly involved in early childhood education and child care practices. Further, there was a strong positive correlation between fathers' and grandmothers' involvement in early childhood education practices and the cognitive development skills of children. The provision of toys (.83) and playing games (.81) with children had a more positive effect size on the cognitive development skills of children. Fathers felt that long working hours and child gender impeded their full participation in child-rearing activities while grandmothers faced challenges of long working hours and lack of money to buy nutritious food. Based on the study findings, it is recommended that families should utilise the locally available cognitive stimulating activities to enhance cognitive development skills of children.

DEDICATION

I dedicate this work to the late Patrice Lee Engle who advocated for children's education and healthcare during her lifetime. I also dedicate this work to my daughter Kasuba Chalwe Kabungo and my beloved wife whose love, understanding, patience and support I will always cherish in my life. To the entire extended family and friends for all their love and sacrifices they made for me and to God who gave me strength.

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LIST OF ACRONYMS

ADAPT	-	Against Domestic Abuse Prevention and Training
ANOVA	-	Analysis of Variance
BRIEF	-	Behavioural Rating Inventory for Executive Functions
CDPs	-	Child Development Programmes
CSA	-	Cognitive Stimulating Activities
ECD	-	Early Childhood Development
EI	-	Early Intervention
FMLA	-	Family and Medical Leave Act
HIC	-	High-Income Countries
HLE	-	Home Learning Environment
HPI	-	Home Possession Index
IQ	-	Intelligent Quotient
LMICs	-	Low and Middle-Income Countries
NDIs	-	Neuro-Developmental Impairments
OECD	-	Organisation for Economic Cooperation and Development
PPVT	-	Peabody Picture Vocabulary Test
RNDA	-	Rapid Neuro-Development Assessment Tool
SES	-	Socio-Economic Status
SPSS	-	Statistical Package for Social Sciences
SRCD	-	Society for Research in Child Development

STEEP	-	Steps Towards Effective, Enjoyable Parenting
UK	-	United Kingdom
UNICEF	-	United Nations International Children's Education Fund
US	-	United States
WHO	-	World Health Organisation
ZANEC	-	Zambia National Education Coalition
ZDHS	-	Zambia Demographic and Health Survey

CHAPTER ONE

INTRODUCTION

1.1 Overview

Chapter One presents the background of the study. It begins with highlights on related literature covering fathers and grandmothers in child development programmes. The Chapter then presents the Theoretical Models, Statement of the Problem, Purpose and Objectives of the Study, and Research Questions as well as the Significance of the Study. These aspects are further followed by the Delimitation, Limitations, Conceptual Framework, Operational Definitions of Terms used and finally, a summary of the salient issues is presented.

1.2 Background

Child development programmes entail children's programmes from birth to the age of 12 years old. They include early learning and after-school services for babies, toddlers, children in Pre-School and children in Kindergarten School through to the sixth Grade (Sacker, Kelly, McMunn & Martin, 2017). There are different terminologies used by different institutions in addressing child development programmes. For instance, United Nations Children's Fund (UNICEF), World Health Organisation (WHO) and the World Bank (WB) refer to them as Early Childhood Development (ECD) though all of them recognise the importance of these integrated and holistic programmes such as nutrition, child care, early childhood education and health at the early age of a child (ZANEC, 2015). It can therefore be surmised that Early Childhood Development includes all the support necessary for every child to realise his or her right to survive, to protect and to care that will ensure optimal development from birth to the age of eight years old. In this study, fathers' or grandmothers' involvement in child development programmes is defined as direct interaction with the child in the form of caretaking, teaching, play or leisure.

Secondly, this study considers fathers and grandmothers' involvement in child-rearing activities in terms of frequency of contact, amount of time spent together (doing cognitive, physical, social, emotional and stimulating activities such as singing, playing games, reading together or shared leisure time), and the perceived accessibility and availability of the father or grandmothers. This can also include the amount of time fathers and grandmothers spend performing routine cognitive stimulating activities such as practising the alphabet, counting,

practising shape and colour, in addition to the number of time fathers and grandmothers spend with the child, and how effective, mutual and reciprocal the play is.

O'Connor and Scott (2007) established that family involvement is associated with an array of positive behavioural, emotional, psychological, social, intellectual and physical outcomes such as improved social connections with peers, emotional security (i.e., maintaining positive relationships with others, being confident) and higher Intelligence Quotient (IQ) scores. Desforges and Abouchaar (2003) also conclude that family involvement has a positive effect on children's academic achievement and social adjustment. In addition to that, Lamb and Laumann-Billings (1999) assert that the involvement of fathers in the lives of young children has been virtually ignored, yet there is evidence of positive outcomes. Other literature shows that child outcomes are enhanced when fathers are involved in their child's early development (Flippin & Crais, 2011). Furthermore, Allen and Daly (2007) argue that fathers' involvement in a child's development is associated with an array of positive outcomes including higher IQs, advanced linguistic and cognitive capacities and improved quantitative and verbal skills.

A similar study done by Harju-Luukkainen, Vettenranta, Wang and Garvis (2020) found that the quality of early learning environments provided by parents plays a critical role in shaping children's future cognitive and academic outcomes. This support includes book exposure and quality verbal interactions about academic subjects. Yang, Chen, Wang, Li, Zang and Haung (2023) in their study entitled 'Parental Involvement and Student Engagement. A Review of the Literature adds that parental involvement is crucial for enhancing children's engagement which includes behavioural, emotional and cognitive components. This engagement is linked to better school adjustment and academic performance. Yang and Chen (2023) also suggested that parental involvement in child-rearing activities such as early childhood education practices having a great role in promoting writing abilities among children. Chen and Mok (2023) add that parental involvement in early childhood education practices is positively related to children's academic buoyancy and adaptability. Contrary to the findings above, Zippert and Rittle-Johnson (2018) argued that not all involvements of parents have an impact on the child's skills. Their study found out that there was barely any link between parent involvement in early childhood education practices and children's broad mathematical skills.

Father involvement was shown to be beneficial to the fathers themselves because fathers who were involved felt more self-confident and effective as parents; they found parenthood more satisfying, felt more intrinsically important to their child and were encouraged even to be more involved (DeLuccie, 1996). Secondly, fathers who are involved in their children's lives are likely to exhibit higher levels of psychosocial maturity, were less psychologically distressed and are more likely to participate in the community and assume leadership roles in civic community organisations (Ansell, Bruns & Chitiyo, 2016). Grossmann, Grossmann, Fremmer-Bombik, Kindler, ScheuererEnglisch and Zimmermann (2002) add that parents who undertake verbal interactions and structure activities or played games with their children allow them to live a rich linguistic communication and context of shared attention and meanings. These experiences encourage children's active exploration and engagement with their environment, improving children's academic skill and their success in school.

A study by Foster, Froven, Skibbe, Bowels and Decker (2016) which investigated the home learning environment (HLE) during early childhood and how mothers' and fathers' parenting practices predict children's academic outcomes revealed that mothers provide HLE activities more frequently than fathers. Even though, in families where mothers had at most a high school diploma, fathers' contributions were a significant predictor of children's early academic skills. However, other studies indicate that fathers' education levels were often associated with mother engagement and that parental education indirectly influences children's language development through multiple pathways (Pansofar, Venon-Feagan & Family Life Investigators, 2010). Furthermore, Duursma (2014) examined the association between the book-reading frequency of low-income fathers and mothers and children's cognitive and literacy skills in the United States. The study established that although mothers read to their children more frequently than fathers, approximately 55 per cent of fathers reported that they read to their children weekly. Moreover, this study revealed that fathers' book reading significantly predicted children's language competencies, book knowledge, and cognitive skills.

Sacker *et al.* (2017) equally posit that fathers' involvement in reading with their children was socially patterned in what might be expected directions. The study further indicated that fathers with higher levels of education and income, those in more advantaged occupations and those who were older than 30 years of age were more likely to frequently read with their children and that children whose fathers read with them were also more likely to live in

environments that are more socially and economically advantaged. The alluded to study equally indicated that fathers who worked longer than a 40-hour week were less likely to read with their children frequently, as were fathers in male-breadwinner households and those living with greater numbers of children. It seems that time works as a household resource as well, with fathers in dual-earner households and those where mothers worked longer hours more likely to read frequently with their children. It was also established that except for physical play and playing of games, mothers continued to frequently participate in parenting activities with their 5-year to 7-year-olds than fathers.

The above body of evidence raised the visibility and expanded our perspective on fathers' involvement in child-rearing programmes from High-Income Countries (HICs). Much remains unknown about fathers and grandmothers as extended family members' impact on the cognitive development of children in low-and middle-income countries (LMICs), including Zambia, making it necessary to conduct a study of this nature in Kasama and Mungwi districts.

A study by Jeong, Siyal, Fink, McCoy and Yousafzai (2018) unveiled that the majority of fathers and mothers reported distinct gender divisions in caregiving responsibilities for young children. The most dominant parental activities were those of earning and providing for the child and family, taking the child on outings, and playing with the child. Teaching the child, engaging in stimulation and seeking health care were commonly mentioned as both paternal and maternal activities. The study equally revealed that play was another dominant paternal activity and that fathers commonly played hide-and-seek, marbles, and crickets as well as playing with toys with their young children. Play was seen as primarily a way to express love and make their children happy. Added to that, Jeong *et al.* (2018) pointed out that fathers' level of education was perceived to be an important predictor of fathers' caregiving roles or participation in child-rearing activities.

The above study was important because it described maternal and paternal activities in caregiving in Pakistan. It, therefore, provided part of the background that the present study was built upon and further explored whether the above-cited factors influence fathers' and grandmothers' participation in child-rearing activities in Zambia and in particular Kasama and Mungwi districts.

Tudge's (2008) study conducted in Porto Alegre also established that Brazilian middle-class fathers were highly active with their children when compared to the six other middle-class samples of his seven-culture study. Most notably, Porto Alegre was the only city in one of the seven countries he studied where middle-class fathers were just as involved as mothers in four main types of activities (lessons, work, play and conversation). Auxiliadora, Dessen and Torres (2011) add that the increase in paternal involvement was due to an increase in the divorce rate, decreasing family size, later onset of parenthood, high levels of poverty and increase in rates of women's employment and single-parent families. In the context of these changes, Bastos, Volker-Pontes, Brasileiro and Serra (2013) concluded that Brazilian family types and fathers would continue to diversify. For example, the middle class includes growing numbers of involved 'new fathers,' but this pattern of behaviour is still apparently exceptional even within the middle class. However, attitudes have recently shifted in favour of paternal involvement, and a majority of Brazilian men reported that they had taken at least some time off from work after the birth of their children (United Nations, 2011).

In the same vein, Hossain (2013) described Bengali fathers' level of involvement with their children as "moderate". He further made three main points in a general portrayal of fathering behaviour in Bangladesh. Firstly, he noted that mothers were the primary caregivers of children, in both rural and urban Bengali families. Secondly, his study showed that fathers spent an equal amount of time with sons and daughters. Thirdly, men's time with children reportedly involved more play than caregiving.

Ball and Wahedi (2010) also underscored that socio-economic status (SES) may be a more important contextual influence on Bengali fathers than elsewhere because almost half the population of Bangladesh lives in poverty. The two researchers also posited that rural and low SES Bangladesh fathers may be relatively traditional in their attitudes toward gender roles in comparison to urban, educated and higher SES fathers who were more often egalitarian within a family. In addition, Hossain (2013) contrasted urban and rural fathers in his observation that men in rural joint families assisted in child-rearing while urban fathers in nuclear families took on more personal childcare responsibility themselves.

In Africa, a study conducted in Kenya by Mbiti (1991) examined African religions and philosophy. It revealed that Kenyan fathers were expected to provide food, protect, cloth and unite the family as a way of being involved in child-rearing activities. The fathers were

highly respected by the children and in case of any problem within the family, the first person to consult was the father. So, fathers have been playing a vital role in guiding families. If fathers failed in their duties towards their children, the wider community would punish them by pouring shame on them.

A study done by Mwoma (2010) in Kenya noted that fathers rarely talk to their children about school work because of being very busy with other activities or because they consider that to be a mother's responsibility and that it is a teacher's primary responsibility because they are paid to do the teaching and ensure that children are performing well. Koech (2010) adds that there was little direct involvement of fathers with their children's reading in Kenya. The father's involvement was reportedly limited to unplanned support for childcare activities like providing monetary upkeep and that of a supervisor. On the contrary, Njeru (2018) revealed that fathers participated more in preschool activities that related to financial support and less in those that required them to sacrifice their time. Most fathers in Ruiru Sub-County were found to be learned and capable of supporting their children's early reading development via reading and listening to them as a way of being involved in child-rearing activities.

Traditional Kenyan men are rarely directly involved in the toddler's lives through interactions like play or their education. Until children can speak, count and walk, the mother is typically the sole active person in the child's life (Lasser, Fite & Wadende, 2011). Ratemo, Ondigi and Kebaso (2007) contend that fathers in Kenya have a more direct influence on the lives of their sons than daughters. This form of socialisation of children is still present in many families in Kenya. On the contrary, Lasser, Fite and Wadende (2011) observed that the traditional role of the Kenyan fathers has undergone great change as a result of colonisation and globalisation in recent years. It is not known if this is the case for Mungwi and Kasama districts of Zambia, hence the need to assess fathers' involvement in child-rearing activities and their influence on cognitive development.

Engle, Beardshaw and Loftin (2005) contend that having an involved father living at home could make a big difference in the life of a young child in South Africa. They cite an example that the household in which children grow up is likely to be better off and the mothers are likely to feel affirmed and assisted in their roles, adding that their nutrition, health care and schooling are likely to be encouraged and supported. Most of all, children will have the pleasure of receiving and giving love in what is an archetypal father-and-child relationship

throughout the world. The majority of South Africa's children are, however, not that fortunate because South Africa has the lowest marriage rate on the continent, ranking the second highest rate of father absence in Africa after Namibia, with low rates of paternal maintenance for children (Khunou, 2006; Richter & Panday, 2006; Posel & Devey, 2006; Lindegger, 2006). However, the father's presence and involvement in the lives of children is a critical issue for social policy and programmes in South Africa (Richter, Chikovore & Makusha, 2013).

Studies have also been conducted on extended family members' involvement in child-rearing activities. The first study to be discussed is that of Naomee (2013) in Bangladesh which revealed that family members including, grandparents, siblings, uncles and aunties differed in their roles depending on their age, relationship and profession. Those who were students did not get enough time with the children; thus, whenever they got time, they played or spent leisure time with the children. Sometimes they also tried to teach different things to the children. The grandparents on the other hand mostly taught manners and values to the children. In families where both parents work, grandparents feed the children, tell stories to them, take them for a walk and also make them sleep. The members, who had jobs, did not have enough time with the children. So, their role was very minor in children's development and education. The study also unveiled that 90 per cent of the mothers did all these things whereas children learnt to walk and talk with the help of members of the family. Things that measure mental and moral development like manners, respect for others, values, helping others and sharing with others were mostly taught jointly by all the family members. Seventy-six per cent of the respondents stated that whenever they had the chance, they tried to teach the children all these values and morals. A similar study by David (2009) showed that the changed roles of the family have a great impact on children's development and education. For families where there is a strong foundation of love, children learn about family bonding and mutual trust. Family values also help in developing children's mental and intellectual strengths.

Sichimba (2015) showed that Zambian grandparents performed more toilet training, protection from accidents and care during illness while Dutch grandparents did more playing with their grandchildren. Grandparental involvement was strongly predicted by attachment. A similar study by Sichimba (2015), which examined the involvement of grandmothers in childcare in Zambia argued that grandparents from the maternal side were more involved in

childcare than the paternal side. The study revealed that maternal grandparents provided more care to their grandchildren than paternal grandparents. Falola (2004) also adds that grandparents in Zambia were expected to participate in child care. On the contrary, a study by Mooya (2016) confirmed that sibling care was a widespread phenomenon in child care in Zambia. The study documented multiple childcare practices that were performed by order siblings in caring for younger children in the home including feeding, bathing and play. The study further established that females performed more care for their younger siblings, especially when parents were present at home, affirming the gender role of socialisation of females as primary caregivers, a notion which is widely spread across the African context. Although the study by Sichimba (2015) and Falolo (2004) exhaustively established the role of grandmothers in child care, they did not highlight the levels and influence grandmothers' involvement in child care programmes on a child's cognitive development skills which the present study intended to establish.

Hansen (2003) also observed that child-rearing in most African societies is a collective responsibility for parents, grandmothers and other extended family members. Grandparents often have a direct and clear role concerning the care and nurturing of children. Grandparents' involvement in Africa is gendered with female grandparents shouldering most of the childcare burden compared to their male counterparts (Jonasi, 2007). Mokomane (2014) added that grandmothers as extended family members, not only provide infant care but are also expected to nurse the mother who has given birth. In African kinship, children are valued by the whole family, and children are frequently sent to live with close relatives for varying lengths of time to get to know a wider family and to consolidate ties (Engle & Breaux, 1998; Anderson, 2004).

Namenang (1992) adds that children are viewed like flowers planted in a field and are to be watched over and raised by all. After weaning, parents play a smaller role, and multiple caregivers may play a major role in bringing up the child. On the other hand, fathers have little to do with very young children. Taboos prevent fathers from frequent contact with infants. Furthermore, fathers rarely show nurturance towards children. Their primary role is that of disciplinarian. When children are old enough to communicate verbally, the father may narrate folktales to them around the fire (Nsamenang, 1987). This pattern is slowly changing due to the influx of western culture which promotes justice and father involvement in child-rearing activities. It is against this background that the present study sought to assess fathers'

and grandmothers' involvement in child-rearing activities and their influence on the cognitive development of children aged between five to six years old in Kasama and Mungwi districts of Zambia.

1.3 Statement of the Problem

Involving fathers and extended family members in child-rearing activities is important. Boyce *et al.* (2006) posit that fathers' involvement with their children in infancy has longer-term impacts on behaviour, mental health and self-worth in adolescence. In corroborating the preceding view, Mwanza-Kabaghe (2015, 2022) found that family involvement improves children's reading. In the same vein, Sichimba (2015) established that grandmothers as extended family members are heavily involved in the childcare of their grandchildren. There have been calls for increased research on men's roles in families in sub-Saharan Africa and for greater efforts to engage men's variety of family-based activities such as reproductive, maternal and child health interventions, and policy (Engle, 1997). Besides that, globalisation has changed family structures and increased the abdication of paternal responsibility (Ratemo, Ondigi & Kebaso, 2017). However, little is known about the levels and impact of fathers' and grandmothers' participation in child-rearing activities for children aged between 5 to 6 years in Zambia and the impact this has on cognitive development. Hence it was important to assess fathers' and grandmothers' involvement in child-rearing activities and their influence on the cognitive development of children aged between five and six years old in Kasama and Mungwi districts of Zambia. This was important because grandmothers and fathers were very active members of the family in child-rearing practices hence documentation of their roles is crucial for decision making both at individual and societal levels. If this study had not been conducted much would have remained unknown concerning the levels of involvement of fathers and grandmothers in child-rearing activities and their impact on the cognitive development skills of children in low-income countries like Zambia.

1.4 Purpose of the Study

The purpose of this study was to assess fathers' and grandmothers' involvement in child-rearing activities and their influence on the cognitive development skills of children aged between five and six years old in Kasama and Mungwi districts of Zambia.

1.5 Research Objectives

The study was guided by the following five Objectives:

- (i) To Ascertain child-rearing activities that Zambian fathers and grandmothers are involved in Kasama and Mungwi districts.
- (ii) To Establish the levels of involvement of fathers and grandmothers in child-rearing activities in Kasama and Mungwi districts.
- (iii) To determine how fathers' and grandmothers' involvement in early childhood education practices as one of the child-rearing activities affects cognitive development skills among children in Kasama and Mungwi districts.
- (iv) To establish activities in child-rearing activities which influence the cognitive development of children in Kasama and Mungwi districts.
- (v) To establish the challenges faced by fathers and grandmothers in being involved in child-rearing activities in Kasama and Mungwi districts.

1.6 Research Questions

Five Research Questions were formulated based on the Study Objectives as follows:

- (i) Which child-rearing activities are Zambian fathers and grandmothers involved in, in Kasama and Mungwi districts?
- (ii) What are the levels of involvement of fathers and grandmothers in child-rearing activities in Kasama and Mungwi districts?
- (iii) How do fathers' and grandmothers' involvement in early childhood education practices as one of the child-rearing activities affect cognitive development skills among children in Kasama and Mungwi districts?
- (iv) What activities in child-rearing activities influence the cognitive development of children in Kasama and Mungwi districts?
- (v) What are the challenges faced by fathers and grandmothers in being involved in child-rearing activities in Kasama and Mungwi districts?

1.8 Significance of the Study

The study can be used as a reference point for acquisition of cognitive development skills among children in Zambia as well as explanation to why fathers and grandmothers are important in enhancing cognitive development in children.

It was hoped that this study would generate information on strategies that might improve fathers' and grandmothers' involvement in child-rearing activities and consequently improve the cognitive development of children. It was also hoped that the findings of this study would highlight progress and gaps existing in involving fathers and grandmothers in child-rearing activities. Furthermore, it was hoped that the knowledge generated through the study would contribute to establishing the specific local cognitive stimulating activities that would foster cognitive skills among children. It was further hoped that the information from this study would be helpful to policymakers and other stakeholders in devising policies and programmes around child development. It was further hoped that the information from this study would be helpful to, parents, Non-governmental organisations (NGO), policymakers and the Ministry of Education in devising policies and programmes around child development.

1.9 Theoretical Model

In order to show how fathers and grandmothers as extended family members influence the development of a child, the study used two theoretical models. The first one being Super and Harkness's (1997) Developmental Niche and Bronfenbrenner's (1979) Ecological System Model.

1.9.1 Developmental Niche

Super and Harkness (1997) define a developmental niche as a system in which the parts interact and function in a coordinated fashion. Super and Harkness (1986) constructed this framework to make sense of cross-cultural comparisons between communities in Kenya and the USA. In this theory, there is compatibility among the elements of the niche, especially under conditions of stability in society, though sometimes there are inconsistencies, especially under the impact of social change and acculturation. Moreover, it is an open system where each component is linked with other aspects of a more general environment. The two scholars further explain that the organism and the developmental niche adapt to one another. Thus, as the individual adapts to his or her surroundings, the developmental niche

also adapts to the individual. Super and Harkness (1986) add that the developmental niche can be used to organise information about children's development and to focus on investigations for improving the lives of children and families.

Although it is not a theory of development in the formal sense, the developmental niche provides a framework for understanding how cultures guide the process of development. At the centre of the developmental niche, therefore, is a particular child, of a certain sex and age, with certain temperamental and psychological dispositions. By these and other characteristics, the child will inhabit a different cultural "world" than the worlds inhabited by other members of his or her family and further, the child's world will also change as the child grows and changes.

Surrounding the child, there are three components or subsystems of developmental niche: The first component is the physical and social setting they inhabit. This includes who they live with (in terms of family patterns, peer groups e.t.c.); the space, organisation and resources in their domestic, play, school and work environments; and the basic schedules of eating, sleeping, studying, and working, to cite a few. Whiting (1980) noted that culture influences child development primarily by serving as a 'provider of settings', that is, by furnishing the diverse contexts of daily life. For example, in some parts of Africa, children participate fully in the daily activities of the extended family, a setting where several different people are continuously involved with them. Furthermore, the social context formed by the persons with whom the child interacts, shapes social behaviour, norms and values. The presence and role of grandparents change the child-rearing setting to a large extent. Grandparents often have more time for focused interaction with the child, since they are less pressed by subsistence tasks (Berry *et al.*, 2002). This interaction between the grandparents and grandchildren may contribute to the development of some cognitive skills among their grandchildren.

The second component of the developmental niche is the customs of child care and child-rearing. This includes the way parents relate to the child, instruct them, train them or play with them, their approach to discipline and punishment, and many more. Super and Harkness (1986) add that customs of care are seen by their users as the only reasonable solution to whatever needs they address and indeed the natural way of doing things.

Customs of care are thus a source of support for parents and other caretakers such as grandmothers because they provide ready-made solutions to the myriad of issues that developing children present, from how to protect children from hazards in the environment to how to ensure that they are adequately educated for their future roles in society. The third component of the developmental niche is called beliefs or ethno-theories of parents or others (psychology of the caretakers). This includes goals and priorities for children's development and socialisation, and beliefs about how they can best be achieved and indeed how far they can influence their children's future. These ethno-theories influence child development, in particular by determining contexts and training practices, though it also happens that parents do not always act according to the normative rules conveyed verbally (Brill, 1999). This resonated well with the present study which assessed fathers' and grandmothers' involvement in childcare programmes and their influence on children's cognitive development.

The present study used this theory to understand how cultural beliefs practised by fathers and grandmothers may affect their involvement in child-rearing activities such as nutrition, child care and early childhood education practices. This theory also fitted well with the phenomenon under investigation in the present study because it draws attention to the interdependency of child-development goals, practices and circumstances. Further, developmental niche theory offered a comprehensive framework for understanding how fathers and grandmothers contribute to their children's (grandchildren) cognitive development. This model showed that fathers and grandmothers' involvement in child-rearing activities is shaped by a complex interaction of cultural, social, and environmental factors.

1.9.2 Ecological System Model

Another theoretical model that guided this study is the Ecological System Model proposed by Urie Bronfenbrenner (1979). This model guided the study by showing how the systems in the model might affect the child's acquisition of cognitive skills.

Bronfenbrenner (1979) observes that the development of the child in an ecological environment appears to be greatly determined by what a child experiences in the immediate and distant ecological settings. Ecological settings such as family, homes, neighbourhoods, communities, playgrounds and schools when working together, have the potential of allowing a child to learn appropriate behaviour, how to talk, read and socially associate with other

children and adults in an ecological environment (Bronfenbrenne, 1979). The model stipulates that human development takes place through the process of progressively more complex connections and interactions between an active, evolving bio-psychological human organism and the persons, objects and symbols in its immediate ecological environments (Bronfenbrenner & Morris, 1998).

From the above statement, it appears that the Ecological Model of System Theory attempts to explain the existing relationships between an active child, and the connections and interactions occurring between and among persons, objects and symbols in the child's ecological environments. According to the ecological systems model, Bronfenbrenner (1979) looks at an individual as an inseparable part of a small social system comprising four interrelated ecological systems, namely: microsystem, mesosystem, ecosystem and macro systems. In this study, the researcher only used two systems namely, microsystem and macrosystem because the two systems were relevant in understanding the phenomenon under investigation.

The microsystem in the ecological systems model describes the relationship of the child with the immediate ecological environment such as home, family members such as fathers, siblings, mothers and grandmothers, neighbourhood, peers, community, playgrounds and schools. Bronfenbrenner and Morris (1998) noted that a microsystem as a child's immediate ecological environment focuses on support from the relationship within a home and school to support the learning and development of the child. It further describes the interrelationship that exists among major ecosystems that surround an individual's life in an ecological environment such as fathers and grandmothers (Christenson, 2000). The microsystem is important to the present study because it defines children's socialisation contexts such as home and childcare settings, where they interact with their caregivers in ways that help them master the cognitive skills necessary to succeed in school.

A macro system, on the other hand, provides an overall cultural or sub-cultural pattern that is likely to influence the development of a child within an ecological environment. It provides the cultural set up through which a child interacts with the environment and indeed functions as an individual. Examples of a macro system that has a relationship with the learning and development of a child include legislation and policy on education, cultural norms, traditions, attitudes of families and community, socioeconomic, political and religious and humanitarian

factors which all have effects and impacts on the development of a child including cognitive skills (Bronfenbrenner, 1991). For instance, the cultural and traditional practices of the father and grandmother may affect the child's development in terms of acquiring cognitive skills. In addition, the ecosystem provides support and structure for agencies and workplaces outside the home and school that results in meaningful relationships towards the learning and development of a child.

The theory fitted well with this study because it demonstrates how shared responsibility among participants (fathers and grandmothers) in the child's learning in an ecological environment is important in fostering cognitive development among children. Further, the theory fitted well with this study because the learning and development of a child revolves around the family, community and cultural connections, and interactions which serve as centres of learning and the developmental process. A closer examination of the model further shows the need for more collaborative relationships among parents, and extended family members (grandmothers) as immediate ecological environments with the potential of influencing child development and in particular, the acquisition of cognitive skills. Lastly, the theory helps in understanding how cultural beliefs might affect fathers' involvement in child rearing activities such as childcare practices.

1.10 Delimitation

This study focused on fathers' and grandmothers' participation in child rearing activities in Kasama and Mungwi districts of Zambia. Fathers and grandmothers are primarily related to their distinct yet crucial roles within the family system and broader sociocultural context. In addition, fathers traditionally have been viewed as primarily financial providers, however, their involvement has evolved to include direct engagement in children's development and providing support to mothers, making them vital figures in contemporary child-rearing dynamics. In terms of geographical location, this study was confined to Kasama and Mungwi districts.

1.11 Limitation

The study was limited to three hundred and ten participants drawn from three geographical study areas, namely: urban, peri-urban and rural with mixed backgrounds and experiences in child development programmes. The study was conducted in only two districts out of the many districts in Zambia with similar cultural backgrounds, generalisation of the study

findings might be done with caution. Further, the Coronavirus-19 (COVID-19) pandemic made the assessment of children difficult as this entailed different environments from the school environment. Due to similar cultural backgrounds among the participants, the findings may be specific to that particular cultural context and not easily transferable to other cultures with different values, beliefs and norms. Further, the sample of this study may not accurately reflect the characteristics of a larger population, therefore, generalisation of the study findings might be done with caution.

1.9.3. Complimentary of Developmental Niche and Ecological Theories in a Study

Integrating Bronfenbrenner's ecological model (1979) with Super and Harkness's (1997) developmental niche theory in this study offered a deep understanding of the influences of fathers and grandmothers on children's cognitive development. The ecological model provided a framework for mapping the various systems influencing children, while the developmental niche theory highlighted the culturally specific practices and beliefs that shape children's experiences. By combining these perspectives, a researcher examined how cultural practices mediate the impact of fathers' and grandmothers' involvement on cognitive outcomes. For example, the ecological model helped identify the exosystem and macrosystem factors (e.g., workplace policies, culture) that affect fathers' ability to engage in childcare, while the developmental niche theory highlighted how cultural beliefs about fatherhood shape their parenting behaviours. The ecological model revealed how societal policies influence the availability of grandparental support, while the developmental niche theory explained how cultural norms dictate the role of grandmothers in child-rearing.

This complementary approach facilitates a comprehensive understanding of the multifaceted influences on cognitive development, considering both the systemic and cultural dimensions. By considering both frameworks, the study showed deeper insights into the mechanisms through which fathers and grandmothers contribute to children's cognitive growth.

1.12 Definitions of Operational Terms

Academic Buoyancy: This is a type of resilience specifically related to academic attainment. It is defined as the ability of students to successfully deal with academic setbacks or challenges. It refers to a student's capacity to successfully navigate and overcome the day-to-day academic challenges and setbacks such as poor grades, difficult assignments or examination stress.

Child -rearing activities: This is defined as the methods, strategies and practices used by parents and caregivers to nurture and guide children's development from infancy through adulthood. It involves teaching children the social norms, values and behaviours as well as providing emotional support, discipline and education. It refers to programmes for children from birth up to the age of twelve years old.

Cognitive development skills: This is defined as a process of growth and change in intellectual and mental abilities such as thinking reasoning and understanding, information processing, conceptual resources, perceptual skills management and language learning, This refers to skills involved in performing tasks associated with perception, learning, memory, understanding, awareness, reasoning, judgment, intuition and language.

Early childhood development: This is a critical period of rapid development starting from conception and continues through to the early years of a child's life. It is crucial for building a foundation for future learning, health and wellbeing. Encompasses physical, socio-emotional, cognitive and motor development between zero to 8 years of age.

Executive Function Skills: These refer to a set of cognitive processes that enable individuals to manage their thoughts, actions, and emotions effectively.

Extended family: Is defined as a family that extends beyond the nuclear family, consisting of parents like father, mother, and their children, aunts, uncles, grandparents and cousins, all living in the same household or a family that includes one household near relatives such as grandparents, aunts, uncles.

Extended family members' involvement: The common role and behaviour in which extended family members engage in their relative's children's development programmes.

Father: Father is defined as a man or A male parent in relation to his children.

Father's involvement- The common role and behaviour in which fathers engage in their children's development programmes.

Non-Resident father- A father who does not live in the same household as the child. A non-resident father may be divorced, separated, working away from home or never married to the child's custodial parent.

1.13 Chapter Summary

The main goal of Chapter One was to provide an overview of the background information based on different child-rearing activities fathers and grandmothers are involved in and their influence on the cognitive development of children. The background information showed a global perspective and exposed the knowledge gap to justify the present study. The Chapter also shed light on the statement of the problem, purpose of the study, objectives and research questions which guided the study. Furthermore, the Chapter provided the significance of the study, the theoretical models, delimitations, limitations and definitions of operational terms used in the study. The next chapter presents a comprehensive review of relevant literature related to the phenomenon under investigation.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

Chapter Two presents a review of the related literature of the study. It gives an explanation of levels of involvement by grandmothers and fathers in child-rearing activities and then explains the impact of fathers' and grandmothers' involvement in child-rearing activities and cognitively stimulating activities that enhance cognitive development skills among children. It also focuses on policies and programmes that promote fathers' involvement in child development. Lastly, literature explaining the challenges faced in involving fathers and grandmothers in child-rearing activities was presented.

2.2. Child-Rearing Activities Fathers and Grandmothers are Involved in.

The evolving dynamics of family structures and gender roles have brought increased attention to the significance of fathers' and extended family members' engagement in child-rearing practices. Historically, fathers' involvement was often limited to financial provision, but contemporary societal and economic demands necessitate a more active and multifaceted paternal role (Kotila, Schoppe- Sullivan, and Dush,2013). Similarly, grandmothers, particularly in many cultures, have traditionally been central figures in childcare, offering a wealth of experience and support to families (Jeong et al, 2018). Konantambigi (2023) adds that fathers are increasingly involved in activities that promote early childhood education, healthy nutrition, and overall childcare. Fathers are now actively participating in school readiness activities, such as reading to their children, helping with homework, and engaging in educational play. Fathers who engage in sensitive and challenging play have children who develop secure attachment relationships (Frosch, Schoppe- Sullivan, and O'Banion,2019). Furthermore, fathers offer unique contributions to child development through their play styles, discipline approaches, and role modelling of masculine traits, enriching children's experiences and shaping their understanding of gender roles and social expectations (Chen, Brody and Miller, 2017).

Studies by Redshaw and Henderson (2013) and Keys, Norris, Cameron, Bright, Tomfohr- Madsen, and Benzies (2019) revealed that fathers can be influential in promoting healthy eating habits by modelling healthy food choices and involving children in meal preparation. They also participate in childcare activities like bathing, feeding, and dressing

their children. Raley, Bianchi and Wang (2012) in their study entitled ‘ When Do Fathers Care? Mothers’ Economic Contribution and Fathers’ Involvement in Child Care’ suggest that fathers engage in more "solo" care of children when their wives are employed and are more likely to do the kind of child care associated with a responsibility for their children when their wives spend more time in the labour market and participate more in routine care when their wives contribute a greater share of the couple’s earnings.

Grandmothers are also involved in child-rearing activities. One of the child-rearing activities is early childhood care and development. This child-rearing activity is most common in cultures where extended family living is common. Grandmothers provide childcare while parents are at work, offering a cost-effective and familiar caregiving environment (Du, Dong and Zhang,2019). Grandmothers are also involved in providing emotional support to both parents and children, contributing to a stable and nurturing family environment. They also transmit cultural values and traditions to the younger generation, preserving family heritage and identity. Grandmothers play a crucial role in supporting mothers, especially in the context of breastfeeding. This support includes providing practical assistance, emotional encouragement, and information about breastfeeding practices. Grandmothers may provide direct childcare, financial assistance, and emotional support, particularly in single-parent families or when parents face economic hardship. Grandmothers also contribute to the transmission of family values and traditions. Grandmothers living with single mothers were the next most involved, while grandmothers in mother-father households were least involved (Pearson, Hunter, Cook, Ialongo, and Kellam,1997).

Further, Chen et al, (2017) add that grandmothers frequently impart traditional knowledge about food preparation and nutrition, which can be especially valuable in promoting healthy eating habits in young children. They are often involved in preparing meals and snacks for their grandchildren, ensuring they receive nutritious and balanced diets. A similar study by McCalman, Heyeres, Campbell, Bainbridge, Chamberlain, Strobel and Ruben (2017) revealed that grandmothers support breastfeeding mothers by preparing nutritious meals, providing emotional support, and helping with household chores. Grandmothers also influence children's food preferences and eating behaviours.

Grandmothers often offer practical assistance, such as cooking, cleaning, and transportation, alleviating the burden on parents and promoting family well-being. Grandmothers are

invaluable sources of wisdom, cultural knowledge, and family traditions, transmitting values and beliefs to the next generation. Grandmothers provide emotional support and guidance to both parents and grandchildren, offering a listening ear, a shoulder to cry on, and sage advice based on their life experiences. Grandmothers also contribute to family stability by providing a sense of continuity, connection, and belonging, strengthening family bonds and promoting resilience in the face of adversity (Gessa, Zaninotto, and Glaser, 2020).

The above studies have provided a good foundation on which the present study would build on the type of child-rearing activities Zambian fathers and grandmothers are involved. There is limited Zambian literature in this area, therefore, the present study explored the type of child-rearing activities Zambian fathers and grandmothers are involved in and showed the interplay between fathers and grandmothers in the provision of child-rearing activities within the family settings.

2.3 Level of Involvement by Grandmothers and Fathers in Child-Rearing Activities

With the rising percentage of mothers' involvement in salaried or gainful employment coupled with the high divorce rates and relationship breakdowns, the roles of grandparents has changed in family life. Grandparents have now become childcare and emotional support providers. Studies conducted by Nguyen (2014) and Di Gessa, Glaser and Tinker (2016) have shown that grandparents around the globe are significant childcare providers. Between 2004 and 2005, 58 per cent of grandmothers and 49 per cent of grandfathers in Europe looked after their grandchildren under the age of 16 years old. Grandparents provide child care almost daily or for at least 15 hours a week (Knodel & Nguyen, 2014; Di Gessa, Glaser & Tinker, 2016). Further, Ko and Hank (2013) observed that grandmothers were more likely to do the cooking of food for their grandchildren, help them with homework, look after them when they fell ill, took them to and collect them from school more than their partners.

Horsfall and Dempsey (2015) argued that grandmothers spent more time providing child care compared to grandfathers because they were deemed more appropriate caregivers for their grandchildren. A similar study by Di Gessa, Zaninotto and Glaser (2020) revealed that approximately 54 per cent of grandparents provided some type of child care for a grandchild, with a higher percentage by grandmothers 55 per cent providing some type of child care to grandchildren for over 12 months (1 year). Child care for grandchildren was much higher in couples 61 per cent than it was among single grandparents 37 per cent. In 91 per cent of

couples providing child care for grandchildren, both the grandmothers and grandfathers reported providing child care for their grandchildren whereas for only 3 per cent of the couples, the grandfather was the only one providing grandchild care. About a quarter of grandmothers reported grandchild care during school holidays. All in all, 80 per cent of grandparents mentioned that they played or took part in leisure activities or cooked for their grandchildren. The activities least mentioned were helping grandchildren with homework 39 per cent and looking after them when they were ill 36 per cent. The study further unveiled gender differences in all the activities undertaken by grandparents with their grandchildren. Overall, a higher percentage of grandmothers reported performing most of the activities than did grandfathers and that they performed them frequently. For example, almost half of the grandmothers reported preparing meals for their grandchildren frequently compared to 30 per cent of grandfathers. Grandmothers were more likely at 10 per cent to care for their grandchildren during weekdays of school terms than grandfathers.

A vast literature also shows that fathers provide some child care to their children. For instance, a survey in China showed that on average, fathers spent 2.05 hours on child care compared to an urban woman who spent 3.34 hours a day on domestic labour such as household activities including child care compared to 2.08 hours by the average husband and that rural women spent as many as 4.27 hours on household chores each day, almost three times as much as their husbands (Institute of Social Science Survey, Peking University, 2010). Xu and Zhang's (2008) study reported a greater shift in the reported behaviour of fathers in Shanghai. For instance, 83.6 per cent of modern fathers compared to 61.8 per cent from their father's generation, thought that men should help take care of the baby. Meanwhile, 87 per cent of these fathers compared to 60.4 per cent from the grandparental generation, had helped with childcare tasks. Added to that, a detailed breakdown of childcare tasks demonstrated that fathers of the younger generation were more likely to pick up children from school or to comfort distressed children than their predecessors. Similarly, surveys in Taiwan indicated that 32 per cent of Taiwanese fathers spent three or more hours daily with their children (Wu, 2006; Fung, 2006).

Jankowiak's (2010) study in Hohhot, a large multi-ethnic city in northern China revealed that Chinese fathers, though identified themselves as modern, only attended to their children occasionally. A closer examination of parental contributions to childcare showed that Chinese mothers in Hong Kong, fed, smiled at, vocalised and engaged in object play with babies more

than fathers did. A survey by Xu (2004) indicated that even in Shanghai where men were reported to be more involved in domestic labour, 93 per cent of 1,921 married men and women identified mothers as the major caregivers in their families. Similarly, interviews with five dual-earner Taiwanese families showed that mothers provided more childcare than fathers. Almost 50 per cent of the fathers in another Taiwanese sample, compared to more than 80 per cent of the mothers, spent more than three hours daily with their children (Wu, 2006).

Naome (2013) unearthed that almost all fathers spend only the nighttime and weekends with their children. In some cases, where both parents work, children spend most of their time with some people like grandparents and aunts. Fathers, thus tend to play games or watch television with children at that time of the day. They rarely try to teach their children anything at all in the small amount of time that they have with their children. It has been established that both parents perform multiple tasks with their children. Mothers were mostly the teachers at home. In some cases, fathers tried to teach the children, only the hard things which the mother had trouble with. The study further revealed that mothers play the most important role in children's physical and mental development.

Huerta *et al.* (2014) also added that fathers spent an average of 1 hour and 40 minutes a day with their children. Across all countries under the Organisation for Economic Cooperation Development (OCED), fathers spent less than half as much time on childcare as mothers did. The total amount of time devoted to children also differs considerably across countries. Father's total time invested in childcare was highest in Australia, Austria, Canada and the United States, with more than 1 hour a day; and lowest in Belgium, France, Japan and South Africa, with less than 30 minutes a day.

Despite the evidence on fathers and grandmothers' involvement in childcare from the studies above, the researcher has yet to come across fathers and grandmothers' levels of involvement in child-rearing activities such as child care, nutrition and early childhood education practices in Kasama and Mungwi districts, hence the present study.

2.4 Impact of Fathers' and Grandmothers' Involvement in Child-Rearing Activities

Having previously discussed fathers' and grandmothers' levels of involvement in child-rearing activities, this section discusses the impact of fathers' and extended family members' involvement in child-rearing activities.

Fathers are important in child development; they promote inner growth and strength among their children. In addition, the involvement of fathers in child-rearing activities may greatly affect their children's cognitive, emotional and social development, which can instil an overall sense of well-being and self-confidence among the children (Desforges & Abouchar, 2003). Baker (2013) stresses that children with highly involved parents enter school more poised to succeed. As more mothers have entered the workforce when their children are very young, researchers on parenting have increasingly recognised the importance of fathers in child development. Furthermore, the consensus in early childhood literature revealed that specific fathering behaviours such as home-learning stimulation are directly related to children's reading, mathematics and social-emotional development in preschool and kindergarten (Cabrera, Shannon, West & Brooks-Gunn, 2006).

The above studies by Desforges and Abouchar (2003), Baker (2013) and Cabrera *et al.* (2006) were conducted in developed nations, therefore, much remains unknown about fathers and extended family members such as grandmothers' impact on cognitive development skills of children in low and middle-income countries (LMICs) including Zambia. It was from this background that the present study intended to explore the impact of fathers' and grandmothers' involvement in child-rearing activities on the cognitive development of children in Mungwi and Kasama districts.

In their book entitled "*Handbook of father involvement: Multidisciplinary Perspective*", Cabrera and Tamis-leMonda (2013) posit that fathers influence their children in a variety of developmental domains and across developmental stages ranging from positive psychological adjustments and lower distress during adolescence, fewer behavioural problems during the preschool and high school years, improved language and cognitive development during the early childhood years. A similar study conducted by Boyce, Essex, Alkon, Goldsmith, Kraemer and Kupger (2006) suggested that father's involvement with their children in infancy has a longer-term impact, predicting improved hormonal reactivity, behaviour and mental health at school age and self-worth in adolescence.

Yeung, Sandberg, Davis-Kean and Hofferth (2001) in their study entitled "*Children's Time with Fathers in intact Families*", found out that better-educated fathers were more likely to spend more time with their children as they tend to be more concerned about their children's development than less educated fathers. At the same time, better-educated fathers were more

likely to have jobs with more family-friendly work arrangements than less-educated fathers so it will be easier for them to take time off work when children are born. However, fathers with better education and better jobs may be more reluctant to take leave as this may be perceived as damaging their careers.

The above studies extensively explored the importance of fathers' involvement in child development but did not explore the impact of extended family members, such as grandmothers on the development of their grandchildren. It was from this background that the researcher undertook this study to ascertain grandmothers' participation in child-rearing activities and their influence on the cognitive development of their grandchildren.

A study by Sacker *et al.* (2015) revealed that the path model showed no significant association between fathers' reading and child's behaviour. Secondly, the study suggested that fathers' involvement in infancy significantly predicted better socio-emotional behaviour at the age of three old although the relationship was not strong. These results suggested that early father involvement might have a small, but significant part to play in the prevention of child socio-emotional difficulties when considered within the broader familial context. The study also revealed that mothers reading with children has a greater impact than fathers' reading on children's behaviour. A similar study done in Zambia by Mwanza-Kabaghe (2015) showed that children who were reading with significant others at home had greater gains in reading in the first grade. The greater strength of the relationship between mothers' reading and child behaviour in comparison with fathers' reading, may be partially due to the beneficial effects of fathers' reading being drowned out by that of mothers. Father's involvement also impacts children by decreasing externalised behaviour, hyperactivity and deregulation, and increasing behavioural self-regulation. In the area of cognitive function and academics, children with involved fathers have higher IQs on average, increased executive function, improved school conduct and scholastic self-concept (Meuwissen & Carlson, 2015; Owen, Caughy, Hurst, Amos, Hasanizadeh & Mata-Otero, 2013)

In their study entitled "Early Father Involvement Moderate Biobehavioural susceptibility to mental health problems in the middle childhood" Boyce *et al.* (2006) revealed that father involvement in the early childhood years is associated with positive child development and psychological outcomes over time. According to the study, when fathers were more involved (caring, playing, communicating) in infancy, children had decreased mental health

symptomatology at nine years of age. Fathers engaged in more roughhouse play, and their involvement in play with preschoolers predicted decreased externalising and internalising behaviour problems and enhanced social competence. Similarly, Jia, Kotila and Schoppe-Sullivan (2012) established that in a nationally representative household sample, positive father involvement was inversely associated with child behaviour trajectories such as less child maladaptive behaviour. Chang, Halpern and Kauffman (2007) add that fathers' involvement in child development activities may compensate for the negative influence of maternal depression (e.g., reduced responsiveness to a child's socio-emotional needs), thereby reducing the risk of child problem behaviours and development. Children of involved fathers are more likely to demonstrate a greater internal locus of control, have a greater ability to take initiative, use self-direction and control, and display less impulsivity. High father involvement was also associated with increased children's feelings of paternal acceptance, a factor that plays a role in the development of self-concept and esteem. Consequently, children of involved fathers had higher self-esteem (Culp *et al.*, 2000; Deutsch, Servis & Payne, 2001; Ross & Broh, 2000).

Positive father involvement in child-rearing activities is associated with numerous benefits, including better outcomes for children, for fathers themselves and the family as a whole (Lamb, 2010; WHO, 2007). For instance, fathers who spend more time with their children have, on average, more favourable labour market outcomes, earn more per hour and work fewer hours per week than their peers who spend less time with their children. Fathers who contribute more to housework and childcare experience a lower risk of divorce than fathers who contribute less and, fathers who are more engaged with their children are more satisfied with their lives than their counterparts who engage less (Smith, 2011; Sigle-Rushton, 2010). A similar study by Cameron, Rimm-Kauffman and Grissmer (2012) suggested that children with highly involved parents enter school more poised to succeed. Vargherse and Wachen's (2016) study entitled "*The Determinants of Father Involvement and Connection to Children's Literacy and Language Outcomes*", adds that through various proximal and distal factors such as fathers' education, income levels, residential status and relationship with the child's mother were indirectly associated with children's language development and literacy activities. The study also found out that fathers made unique and direct contributions to their children's literacy outcomes through their engagement in reading and writing activities, the use of complex language and responsive parenting behaviours. In agreeing with the above

findings, Xu and Zhang's (2008) survey in urban and suburban areas of Shanghai unearthed that there were positive associations between father presence, father-child relationship and children's academic performance such that children with more involved fathers outperformed their peers at home and school.

A study by Jeong *et al.* (2018) further discussed the importance of extended family members in child development. They stressed that the majority of children in their study grew up with siblings and resided with extended family members, most commonly relatives from the father's side of the family. Parents explained how other family members additionally shared, supported and even relieved fathers' and mothers' caregiving roles. Other family members largely conformed to the predominant gendered parenting roles delineated between fathers and mothers, with aunts and grandmothers largely supporting mothers' roles in feeding, other child care and house chores activities, with uncles primarily taking the child out and providing food or medicine for the child as needed. In particular, non-resident fathers and their partners highlight how uncles played an important role in fulfilling typical paternal caregiving roles such as playing with the child or taking the child out, while the child's father worked away and apart from the family for extended periods.

Grandmothers play an important role in the upbringing and development of children in many cultures. A study by Mol, Bus and De Jong (2015) entitled "*Interactive Book Reading in Early Education: A Tool to Stimulate Print Knowledge as well as Oral Language*" revealed that the involvement of grandmothers in child-rearing activities promotes language and literacy development in children. Grandmothers who fully engage in stimulating activities such as reading to their grandchildren enhance children's cognitive and language development. A similar study by Mancini (2014) showed that grandmothers' engagement in stimulating activities with their grandchildren, such as reading, storytelling, and playing education could enhance cognitive development, language skills, and problem-solving skills. Further, they provide a supportive environment for language development, vocabulary expansion, and literacy skills. Grandmothers' involvement in child development programmes could also have long-term effects on children's development and well-being. For instance, the study by Fingerman, Kim, Birditt and Zarit (2016) showed that children who have a close relationship with their grandparents have better emotional and social adjustment, higher levels of self-esteem, and more positive attitudes towards ageing. Di Gessa, Glaser and Tinker (2016) add that grandmothers provide a nurturing and loving environment for their

grandchildren. They offer emotional support, comfort, and a sense of security, which could help children develop strong emotional bonds and resilience. Grandparents can also provide children with a sense of continuity and stability, as well as opportunities for learning and growth. A similar study by Choi, Sprang and Eslinger (2016) revealed that grandparents' involvement in child development programmes provides emotional support and stability to grandchildren, particularly in families experiencing adversity. Grandparents have also been shown to be important sources of cultural knowledge and identity for children. Chen, Chen, Ming Lo, Kelley, Chan and Patrick (2022) add that grandparents' involvement in child development programmes promotes intergenerational relationships and communication. The study also shows that grandmothers serve as a bridge between different generations, sharing their life experiences and cultural knowledge with their grandchildren, which can contribute to the children's socialisation and cultural identity. Grandmothers could act as role models and teach important social skills and moral values to their grandchildren. They provide guidance on appropriate behaviour, empathy, and interpersonal skills which may lead to fostering positive social development (Rousseau, Dubeau & Parent, 2017). Grandmothers' love, acceptance, and affirmation could promote positive self-esteem and assist in the formation of a strong identity in grandchildren. Their validation and support play a crucial role in shaping the child's sense of self-worth (Fuller-Thomson, Minkler & Driver, 1997).

The study by Yu and Zang (2021) shows that the involvement of grandparents in child-rearing activities affects children's and adolescents' overweight and obesity, malnutrition, sickness, nutritional balance and exercise to varying degrees. Specifically, compared to children and adolescents who do not live with their grandparents, the ones who lived with their grandparents had a 2.5 per cent decrease in overweight, a one per cent increase in the probability of recent illness or chronic disease, a 3.9 per cent increase in nutritional balance, and an average of 20 more minutes of exercise per week. The result demonstrated that grandparents' coresidence affects children's and adolescents' physical health slightly and that negative and positive effects coexist. Vutha, Pide and Dalis (2014) in their study entitled "*The impacts of adult migration on children's well-being: The case of Cambodia*" provided evidence from Cambodia on the health and nutritional status of grandchildren growing up with their grandparents. They further revealed that children were more likely to experience illness and injury, and negative long-term health and nutritional effects, including being underweight and wasting. Contrary the study by *Chung et al.* (2020) in Pakistan revealed that

there was an association between grandmother involvement and child growth and development. Early grandmother involvement had a positive relationship with child weight, but this association became negative as the child grew older. Grandmother involvement in child development was also positively associated with cognitive, fine motor and socio-emotional development.

A similar study done in Cambodia by Schneider, Phou, Tum, Kelley, Parker and Turner (2021) showed that the majority of grandparents described that adequately feeding grandchildren was an essential part of their role. Grandmothers reported dedicating substantial resources both time and money to obtaining and preparing food. Many grandparents said that it was essential to provide their grandchildren with adequate and good quality nutrition to keep them healthy. Some grandparents discussed the link between a diet balanced in nutrients and grandchildren's health. Furthermore, grandparents felt that obtaining safe drinking water for consumption and food preparation was important for preventing illness among grandchildren.

2.5 Cognitive Stimulating Activities that Enhance Cognitive Development Among Children

Having discussed the impact and influence of fathers and grandmothers as extended family members' involvement in child-rearing activities, this section discusses various studies on cognitively stimulating activities that could enhance cognitive development in children. To begin with, Zucker *et al.* (2013) observed that formal and informal activities such as reading a book, telling stories and singing, provide children with pre-academic cognitive stimulation. They expose children to language experiences that would include vocabulary, the structure of a story, and syntax which are significant predictors of young children's pre-academic skills. In addition, these activities expose children to numbers, quantity, and concepts such as counting and naming shapes which predicts mathematics skills (Malin, Cabrera, & Rowe, 2014). Other studies have offered evidence on the effects of children's involvement in cognitively stimulating activities at home during the early years and their early reading, language, and mathematics skills (Baker, 2013; Malin, Cabrera & Rowe, 2014). Howes *et al.* (2008) added that children in childcare settings who participated in high levels of cognitively stimulating activities such as reading and telling stories had stronger pre-academic skills than children who participated in these activities less frequently. In addition, Bernal and Keane

(2011) argued that good inputs such as nutrition, books and toys enhance cognitive development.

Crosnoe, Leventhal, Wirth, Pierce and Pianta (2010) established that children in multiple settings such as homes, child care and first grade who experienced cognitive stimulation had higher rates of learning from Grades 1 to 5 than their peers. These children scored higher grades in mathematics and reading when they were consistently stimulated at home and in childcare settings. They also scored high marks in reading when they were consistently stimulated in all three settings. In the same vein, Cabrera, Moon, Fagan, West and Aldoney (2020) observed that in two-parent families, children's pre-academic reading and mathematics skills were directly related to the quality of their father's cognitive stimulation in toddlerhood. Their study further revealed that children benefited more from their childcare experience when parents provided higher levels of cognitive stimulation at home.

Children's early reading and mathematics skills are strengthened at preschool when both mothers and child-care providers engaged in high levels of cognitive stimulation during childhood. The following activities parents and grandmothers engage in at home to cognitively stimulate their children. Begin with Diamond and Lee (2011) point out that puzzles and brain teasers encourage children to solve puzzles, jigsaw puzzles, and brain teasers. These activities promote problem-solving skills, logical thinking and spatial awareness. Memory games enhance memory retention, concentration, and attention span. They stressed that parents needed to provide children with building blocks construction sets like LEGO or magnetic tiles to promote spatial skills, creativity, and problem-solving abilities. Similarly, Lillard, Hopkins, Dore, Smith and Palmquist (2013) revealed that exposing children to memory recall activities encourages them to recall and share details about past events, such as a family trip or recent celebration. This activity strengthens memory, narrative skills, and verbal communication. Word games and rhyming help children develop language skills, phonological awareness, and vocabulary expansion. Parents and caregivers are encouraged to set up pretend play with costumes and props by allowing children to engage in imaginative play. This activity promotes creativity, language development, social skills, and problem-solving.

McClelland, Acock and Morrison (2006) stress that exposing children to arts and crafts activities fosters creativity, fine motor skills, and visual-spatial awareness. This can be done

by engaging children in arts and crafts projects that involve cutting, pasting, colouring, and drawing. Reading and storytelling are other activities that could enhance cognitive development among development. This activity promotes language development, vocabulary, and comprehension skills. Engaging children in nature exploration is another activity that could promote curiosity, observation skills, and scientific thinking. Parents or grandmothers could take children on nature walks, and encourage them to observe and collect items like leaves, rocks, or shells. They also revealed that mathematics activities and computer games help children to develop cognitive skills. Children could be introduced to basic math concepts through hands-on activities like counting objects, sorting, and matching. This helps children develop numeracy skills, logical reasoning, and mathematical thinking. Parents or grandmothers could select age-appropriate educational computer games and apps that focus on cognitive skills, such as problem-solving, memory, and attention. Lillard et al (2013) add that sorting and categorizing is another cognitively stimulating activity that could promote cognitive development among children. Children should be provided with various objects or pictures and asked to sort them based on specific attributes like colour, shape, or size. This activity enhances classification skills and logical thinking among children.

African traditional activities can offer unique opportunities to enhance cognitive development among children. For example, Igloi and Gacsi (2009) in their study entitled “*The Development of the Ability to Solve Riddles in Early School Age*” revealed that traditional puzzles and riddles stimulate children's cognitive abilities and encourage perseverance. This can be done by providing children with puzzles, riddles, and brainteasers that require logical thinking, problem-solving, and reasoning skills. Practising traditional folktales may promote language skills, listening comprehension, critical thinking, and cultural understanding. Ogundele and Tihamiyu (2018) add that traditional board games such as “*mancala*” promote critical thinking, strategic planning, mathematics skills, and problem-solving among children. Introducing children to African proverbs and riddles which offer linguistic challenges, critical thinking, and cultural insights promotes language skills, problem-solving, and metaphorical thinking among children (Nwahunanya, 2013). Engaging children in singing traditional songs, playing musical instruments, or participating in musical games supports children’s cognitive development by promoting memory, attention, language skills, and coordination. These activities also foster an appreciation for music and rhythm (Standley & Whipple, 2017). Mackenzie and Skoe (2012) in their study entitled “*Enhancing Memory for Older*

Adults: A Classroom Perspective” revealed that scissor skills and paper crafts games enhance fine motor skills, hand-eye coordination, and spatial awareness among children. Parents should engage children in activities that involve cutting and pasting, such as creating paper collages or making paper snowflakes. Memory tray games are also activities that may stimulate children's cognitive development. Parents may place a variety of small objects on a tray, let children study them for a short time, and then cover the tray and ask them to recall and name as many objects as possible. This way it would enhance visual memory, attention to detail, and recall abilities among children. Engaging children in outdoor play activities such as running, climbing, and playing on playground equipment, helps children develop their gross motor skills, spatial awareness, and physical coordination. These activities also contribute to their cognitive development as they explore and interact with their environment (Lillard *et al*, 2013). The above studies were done elsewhere, they have not been done in Kasama and Mungwi Districts, hence the present study.

2.6 Challenges in Involving Fathers and Extended Family Members in Child-Rearing Activities

In their study entitled: “*Fathers Involvement in Early Interventions: Exploring the Gap Between Service Providers’ Perception and Practices*”, McBride *et al.* (2017) identified the following barriers to fathers’ involvement in child-rearing activities. Lack of presence by fathers during early intervention (EI) services was cited as the barrier to father involvement. Fathers were not present due to work obligations. Secondly, fathers were disengaged in the process, meaning that fathers were uninterested or unaware of the services being provided and may not be involved in the child’s life at all. Providers cited traditional gender roles as being barriers to father involvement in EI at different levels: societal (Societal; Gender Roles), familial (Division of Labour) and individual (Fathers’ Beliefs about Roles and Parenting Efficacy). There was an acknowledgement of societal gender roles as cultural expectations of who does what. Because of the societal expectations that stipulate men should work while women care for children, men were not expected to participate in EI at a societal level. Societal expectations are of women being required to be better equipped to deal with infants and small children’s needs. The study also revealed that EI (early intervention services) services were gendered services, meaning that providers had difficulty working with fathers. They reported that fathers were not present because they were working, thus making it difficult for providers to begin to build partnerships with fathers if they did not see them.

Work was reflected in terms of providers' perceptions of gender roles and family values. Similarly, fathers' work was also reported as a barrier because it occurs at the same time as providers' work.

Baxter and Smart (2011) add that a father's involvement is likely to vary according to a child's characteristics. For example, the age of the child is an important determinant of the time parents devote to childcare activities. Fathers' child care time seems to reach peak level at pre-school age and declines with increasing age of the child. Temperament is another child's characteristic that may also affect fathers' involvement. Fathers may find it difficult to engage in activities with children with difficult temperaments (Baxter & Smart, 2011; Lamb, 2010). The sex of the child may also affect how fathers interact with their children. Although there is no conclusive evidence on whether fathers are more involved with boys or girls, it is possible that for certain tasks, fathers engage differently with sons and daughters (Lamb, 2010). For example, Baxter (2012) established that fathers were somewhat more involved with sons than daughters in more personal care activities, such as helping with the toilet and bathing or showering. The number of children in the household may also affect the number of times fathers spend on childcare-related tasks. Fathers dedicate less time to their children when they are in large families, perhaps in part because additional time is spent on other domestic work in the families (Baxter & Smart, 2010). The above studies highlighted challenges fathers face in being involved in child-rearing activities, the current study focused on challenges involving fathers and extended family members such as grandmothers.

Dermott's (2005) study entitled "*Time and labour: Father's Perceptions of Employment and Childcare*", revealed that child characteristics (e.g. age, gender, temperaments), parents' characteristics (e.g. beliefs, attitudes, preferences, motivation, confidence), stresses on and support to parental relationships (e.g. marital relationship, co-parenting process) posed a challenge to fathers' involvement in child development programmes. Hauari and Hollingworth (2009) add that parents' characteristics and personal developmental trajectories, such as their age, education trajectories, such as age, education and also class influenced the dimensions of fathers' involvement in child development programmes. The study shows that class and race or ethnicity could constrain decisions around fathering and would have some impact on fathers' involvement in child-rearing activities such as childcare.

Norman *et al.* (2014) cited work factors such as workplace conditions and organisational culture challenges that might limit fathers' involvement in child development programmes. The study further showed that long employment hours had a strong, negative association with men's contribution to childcare and housework. Long work hours were also likely to have a negative association with the accessibility of fathers. Mothers' work hours were more important in shaping father's roles at home with some evidence suggesting this has an even larger influence on fathers' involvement in child development such as childcare and responsibility for the housework than fathers' work hours (Dex & Ward, 2007; Norman, 2010.). Similarly, Petts, Knoester and Li (2018) suggested that socio-economic status (SES) may also be associated with father involvement in child development programmes. Men with higher incomes and levels of education may work in jobs that are highly demanding of their time and reduce the time they can spend with their children, and men who work in low-wage sectors may be subjected to unpredictable schedules and inflexible hours.

Reynolds, Callendar and Edwards (2003) contend that the scheduling of work hours might also have an impact on the extent to which a father is accessible and involved in child-rearing activities for his children. Work schedules that are 'non-standard' or provide individual autonomy as to when and where work is undertaken could enable fathers to be more involved in childcare, responsible for the housework and accessible at certain times of the day or night. For instance, shift or weekend work could be conducive to fathers having a higher level of involvement and responsibility for their children compared to fathers with a work schedule of fixed hours during the day. This is also shaped by the mother's work schedule as fathers may be mobilised to drop off or collect children from childcare or school and look after the children in the evening or at weekends while the mother is at work.

Jeong *et al.* (2018) further revealed that poverty impacted both father's and mother's parenting capabilities as well as their emotional well-being. Parents in this study underscored how the lack and instability of money were a major constraint and source of stress. Poverty undermined the role and identity of fathers as providers with unstable jobs and sources of income causing difficulties at times for fathers to purchase food, clothes, and toys, pay for their child's school fees seek health care and treatment, and serve money for an emergency. Societal gender norms also influenced parents' involvement in child development programmes. Parents highlighted how mothers were restricted in mobility and were expected to remain at home with the child the whole day. Due to these social norms, mothers expressed

how they were entirely reliant on fathers to fulfil the out-of-home tasks. Huffman, Olson, O’Gara and King (2014) assert that men with more traditional views of the provisional father role tend to work longer hours and experience a greater amount of work-family conflict, and mothers’ work hours are more predictive of fathers’ involvement than fathers’ work hours, indicating that women’s decision to work or stay home has a large influence on men’s involvement as well. Parents’ view on gender roles plays a large part in how the maternal relationship impacts the father’s involvement in child-rearing activities. Maternal gatekeeping might be viewed as, at least in part, a result of the belief that the woman is a primary caregiver and men have a more auxiliary role (Norman, Elliot & Fagan, 2014).

Wangari (2006) equally observed that many traditional practices continue to influence fathers’ involvement in child development programmes in today’s Kenya. For example, fathers are excluded from pre-natal, post-natal and early childcare practices in the Kikuyu ethnic community. Therefore, father-child interaction is low in Kenya. Regarding child development outcomes (e.g., social, emotional, and cognitive development), the quality of the father-child relationship appears to be much more significant than the quantity of the father-child contact (Pleck, 1997).

Furthermore, fathers who are not married to their child’s mother, as well as divorced non-custodial fathers are often prevented from being involved with their children as they would like to be, based on pervasive post-divorce preferences of awarding primary custody to mothers, and by policies that make paternal access to children dependent on the financial provision. For men with lower income potential or with barriers to employment, such as past criminal records, these barriers may be insurmountable. Such obstacles are often at odds with the purported standard of “best interest of the child” when adjudicating post-divorce arrangements (Raub, Carson, Cook, Wyshak & Hauser, 2013).

In South Africa as well as the region, one of the challenges families face in involving fathers or extended families in child-rearing activities is a result of a combination of colonisation and urbanisation, which have radically transformed family arrangements and roles over the last century. Colonial powers in Southern Africa forced people into paid work by levying taxes that required local people to earn money. A pattern of male and, much later, female migration from rural to urban areas was established, with families separated for long periods. In South Africa, the Apartheid Policy controlled the movement of people in a way that entrenched

migrant labour and disrupted family life (Howiz, 2011; Posel, 2003). Desmond and Desmond (2006) agree with the discussed assertions by observing that men in the highest-earning category are three times more likely to live with their children than men in the lowest-income category. The failure and shame that men feel when they cannot support their children, may cause men to avoid being involved with their children.

The above studies have exhaustively highlighted the challenges faced by fathers' involvement in child-rearing activities, though they did not highlight the challenges faced by extended family members such as grandmothers. The present study sought to explore the challenges faced by both fathers and grandmothers in their involvement in child-rearing activities among children aged from 2 to 6 years old in Zambia and in particular Kasama and Mungwi districts.

2.7 Policies and Programmes That Enhance Fathers' and Extended Family Members' Involvement in Child-Rearing Activities

There has been much praise for Canada's approach to fathers and parental leave. In contrast to its poor record in child care provision, one of Canada's greatest strengths in family policy is its Employment Insurance Act of 2001, which provides paid parental leave for almost a year. While these are reserved for mothers as maternity benefits, either fathers or mothers can take the latter 35 weeks. The province of Quebec's policy is even more generous, with an additional 5 weeks devoted exclusively to fathers (Doucet & Tremblay, 2006). Canada does not have a record of flexible working options available to parents. There are provisions in government jobs, although, in practice, the flexibility in these positions varies within the different parts of government, and whether or not there is a family-friendly work culture, in particular government offices. These arrangements apply both to flexible working options as well as to the uptake of parental leave by fathers (McKay & Doucet, 2007).

Merla and Deven (2006) equally posit that over the past decade, the federal state of Belgium developed policies based on a paradoxical compromise between two distinct, at times contradictory, models of work-family balance. The first model is egalitarian. It promotes equality between women and men through women's equal participation in the labour market and the generous provision of childcare, mainly for children aged two- and a half years. The second model is neo-familialist, marked by a gradual move from a traditionalist view of women's role in childcare to the advocacy of the 'freedom of choice' of 'parents' to work or

take care of children. As a result of this compromise, Belgium's supply of state-sponsored childcare services for children is relatively high, especially for children from the ages of two-and-a-half years to six years of age. Employed parents are entitled to the statutory right to paid maternity, paternity and parental leave. Thus, compared to Canada, Belgium's formal provision of childcare is relatively high, especially for preschool children (coverage rate approximates 100%), but is much weaker for children under the age of two-and-a-half years of age (coverage rate approximates 30%). The above policies have seen fathers' involvement in child-rearing activities increase.

Bergnehr and Wells (2014) opined that Sweden is known as a social welfare state, where the people who reside in Sweden are entitled to certain public benefits at little or no cost to the individual. Over the past century, Sweden has reshaped its culture, growing from one of the poorest nations in Europe to a flourishing country that others emulate, especially for their family policies that promote fathers' involvement in child-rearing activities. To help reduce the work-family conflict, Sweden has provided its citizens with generous parental leave packages, as well as providing subsidised high-quality childcare (Stier, Lewin-Epstein & Braun, 2012). Ray, Gornick and Schmitt (2010) add that one of the most comprehensive parental leave programmes in the world was to create a gender-equal society, which expanded individual freedoms and balance the family-work conundrum for both mothers and fathers. (Thomas & Hildingsson, 2009).

Sweden then became the first country in the world to allow both parents to take time off from work for the sake of their children, promoting men's increase in their involvement in child care and mothers' work in the paid labour market. Parental leave permits parents to take a maximum of 480 days off work. The remuneration is tied to their previous earnings (the salary) as the first 390 days of leave consist of a flat rate (in total for both parents). Parents are eligible to receive 80 per cent of their salary if they have either worked for six months before the child's birth or for 12 full months over the past two years (The Swedish Social Insurance Agency, 2012). A person who has been away from work due to parental leave has the right to return either to the same or a comparable position while receiving the same salary. Fagerskiold (2008) adds that Swedish parental leave is particularly flexible. During the first two weeks after the birth of their child, both parents are entitled to parental leave, so that they both help manage and be there for their new child as the mother recovers. After the first two weeks, only one parent may utilise parental leave time but is entitled to use some

parental days until the child's first year at school. By implementing these family policies that affect both public and private lives, Sweden has developed a welfare model where parents can better manage their career and their families (Anderson, 2008). Haas and Hwang (2008) also add that the number of paternity leave taken by Swedish fathers was positively associated with closer relationships with children; the frequency of taking responsibility for children, childcare and physical care tasks; as well as the number of hours spent with children.

Ting-ting (2017) further observed that father-friendly communities and a mass of involved fathers could be regarded as a result of the long historical process of interplaying among plural feminist culture and strategies in education, politics, economics and religion, new images of fatherhood in literature and medium, set of progressive and family laws and policies and organisational culture on work-life balance promoted fathers' involvement in child-rearing activities. For instance, in the 1990s, the song '*Papa Come Home*' sung by Evert Taube promoted men into active caregivers and increased fathers' usage of parental leave. The study also revealed that in 2015, 25 per cent of children preferred meals cooked by their fathers. In 2017, a Swedish comedy show called *Bonus Family*, reflecting the story of how a modern bonus family deals with practices on taking care of various children was broadcasted by SVT every Monday and immediately got a high rating. The conflict between new family patterns and parents' traditional practices was discussed on the show. Therefore, father-friendly social policies in Sweden were the cornerstones of promoting men to become involved and active fathers in child-rearing activities.

Almqvist and Duvander (2014) also observed that Sweden has maintained a considerably stable governmental policy to address gender equality in a wider range of areas and to create good conditions for both men and women to enjoy the same power and opportunities in the workplace and domestic area by pointing out the requirements of career women and possibilities of reconciling work and family lives for parents, especially for fathers. These father-friendly social policies have become a matter of left-right consensus in Swedish politics. Some of the father-friendly policies introduced were encouraging men to take as much responsibility as mothers for children and household duties, as well as freeing women's time for labour market work such as child allowance rather than the family allowance, gender equality bonus that promotes parents to have joint custody and share the parental benefit.

A similar study by Wisso and Platin (2015) noted that balancing work and life's organisational culture in Sweden played a key vital role in supporting more and more involved fathers in child development programmes. Bygren and Duvander's (2006) study indicated that Swedish companies and institutions undertook four main strategies to improve men's participation in child development programmes. The first one was to encourage male managers and male employees to take parental leave by topping up the parental leave benefit from 80 per cent to 100 per cent of previous salaries. The company's caring values also strongly supported fathers in being more active in child care. More and more fathers receive father-friendly perceptions from top managers (Hobson, 2016).

The second strategy was that of supporting women's equal employment opportunities. After 1992, every company in Sweden carried out an action plan for equality. Both men and women carry some responsibility as breadwinners and caregivers. The third one was that of carrying out flexible work. For example, 25 per cent of employed fathers can decide on work time (Bjornberg, 2016). Further, parents in Sweden can bring their children to the workplace and work at home and have the right to plan work days and flexible work hours. The fourth strategy was to reduce working hours to meet family needs. All men's working hours decreased from 47 hours per week in the 1950s to 40 hours in 1973. Twenty per cent of the companies in Sweden further reduced working hours in 2016 (Haas & Hwang, 2016; Nyberg, 2017). The above strategies employed by the Swedish government increased fathers' participation in child-rearing activities such as child care, however, it was not known if those practices applied to Zambia's situation, hence the present study.

In their study entitled *'Father Leave and Father' Involvement: Evidence from Four OECD countries*", Huerta *et al.* (2014) revealed that in Australia, fathers who took ten or more days off work around childbirth were more likely to be involved in child care related activities when children were 2 to 3 years old than fathers who did not take leave. For example, fathers who took the longest period of leave (10 or more days) were more likely to help their children to eat at least once a day, than fathers who did not take leave (with an odds ratio of 1.28). The odds of being involved in child development programmes amongst fathers who took at least 10 days off were significant for all activities (odd ratio ranging between 1.28 and 1.74), except for changing diapers or helping the child use the toilet. In addition, even fathers who took shorter periods of leave (less than 10 days) were more likely to help their child go to bed than fathers who took no leave. Fathers taking ten days or more leave were more likely

to be involved in feeding and changing diapers than fathers who did not take leave. They explained this weaker association because, in Denmark, there is a more equal share of childcare-related tasks between partners irrespective of the use of leave entitlement.

Huerta *et al.* (2014) further revealed that in the United Kingdom, leave-taking was associated with fathers' involvement when the child was around nine months old. The study suggested that parental or paternity leave-taking was associated with regular paternal involvement. Fathers who took time off work through this type of leave were more likely to regularly participate in three out of four activities than those taking leave (1.39 times the odds of changing diapers; 1.29 the odds of getting up at night for the child; 1.20 the odds of daily feeding their child). Furthermore, it was clear that fathers who took time off through this type of leave were those showing the highest odds of involvement. Hosking (2006) adds that in 2003, the UK government introduced paid paternity leave for one to two consecutive weeks on certain terms and conditions. Employers can claim back 92 per cent of the Statutory Paternity Pay (SPP). In addition, eligible employees who are parents of children under 6 years of age, or parents of a disabled child under 18 years of age have a right to apply for work flexibility and their employer to consider such a request.

On the other hand, taking some time off work around childbirth in the United States was associated with higher odds of fathers' involvement in their children's lives, especially leave periods of two or more weeks. Fathers who took two or more weeks of leave had greater odds of regularly carrying out all of the childcare-related tasks than fathers who took no time off work. The odds were highest for changing nappies (odds ratio of 1.99) and smallest for reading books to the child (odds ratio of 1.34). The study further indicated that many more fathers could engage in reading to their children than engaging in personal care activities irrespective of their use of leave. Therefore, taking time off work was positively associated with engagement in activities the father would not do otherwise.

In addition to the discussion above, Heymann and McNeill (2013) stress that public policies, gendered practices and economic positions may constrain or enable fathers to take paternity leave when their children are born. Worldwide, 96 per cent of the countries provide paid parental leave, making the United States the only high-income country lacking a statutory paid parental leave policy. In the United States, the Family and Medical Leave Act (FMLA) does allow employees who meet eligibility requirements (i.e., worked 1,250 hours in the

previous year for an employer with 50+ employees) to take up to twelve weeks of unpaid leave after the children's birth. It is estimated that 40 per cent of employees do not meet requirements for (unpaid) leave under FMLA, only about 17 per cent of the companies offer paid paternity leave to their employees, and around 30 per cent of all U.S. workers have some access to paid leave (Melamed, 2014; Petts *et al.*, 2018). The research further shows that American fathers are extremely concerned about parental responsibilities. According to a 1998 National Survey conducted by the National Partnership for Women and Families by Lake Sosin Snell Perry and Associates, 29 per cent of men and women expressed concern about getting time off to care for a new baby or sick family member. The report also showed that 90 per cent of those polled wanted employers to do more to help working families (Hosking, 2006).

Another study conducted in the United States by Knoester, Petts and Praggs (2019) entitled "*Paternity Leave-Taking and Father Involvement among Socioeconomically Disadvantaged U.S.*", examined the associations between the amount of time that U.S. employed fathers took off work after the birth of a child. The results of the study showed that one year after birth, paternity leave-taking and length of leave were positively associated with fathers' engagement and responsibility in child development programmes. Furthermore, paternity leave-taking was positively associated with trajectories of fathers' responsibility over the first five years after birth. Length of paternity leave was positively associated with the trajectories of a father's engagement. The study also highlighted that paternity leave-taking as well as the length of leave was likely to boost fathers' engagement and responsibility among nonresident fathers. The study suggested that an expansion of paternity leave-taking might encourage other subsequent levels of father involvement, especially among nonresident fathers. A similar study by Galinsky, Aumann and Bond (2011) added that paternity leave encouraged fathers to practice parenting skills and engage with their children while also fulfilling their expectations as breadwinners. In the process, paternity leave offered support to fathers who sought to fulfil both new and traditional fathering ideals. In addition, both fathers and children benefited when fathers were able to spend time with their children from birth, making access to paternity leave especially important. Children also benefit from fathers' care by engaging in developmentally appropriate activities such as reading, singing and playing with them (Edward, Sheridan & Knoche, 2010).

Edin and Nelson (2013) pointed out that, many fathers stated that their most important role as fathers was to be engaged in their children's lives, and most men believed that employers should offer paid paternity leave so that fathers would care for and bond with their new children. Despite desires to find better ways to balance their work and family lives, paternity leave-taking by men in the United States was largely discouraged by gendered and economic practices (Aumann, Galinsky & Matos, 2011; Heymann & McNeill, 2013). Similar studies by Huerta *et al.* (2014) and Seward, Yeats, Iftexhar and DeWitt (2006) suggest that fathers who took paternity leave were also more likely to change diapers, prepare food for and help dress their infant children. They were also more likely to take young children to the doctor and engage with 5-year-old children, as compared to fathers who did not take paternity leave. Leave-taking also seemed to increase the likelihood that fathers engaged in developmental tasks and caretaking when children were 2-3 years old.

In Australia, the federal government's Workplace Relations Act of 1996 makes provision for companies to introduce family-friendly policies and practices that include flexible working hours and paid paternity leave. The aim of this is to help both men and women balance their work and personal lives. France equally introduced paternity leave in 2002, stipulating that a father may take up to 11 days of paternity leave for the birth (or adoption) of a single child and 18 days for a multiple birth or adoption. A French government survey revealed that 94 per cent of fathers took leave for the maximum time. In addition, there was no indication that the attitude of French employers deterred men from taking paternity leave. In Japan, the Health, Labour and Welfare Ministry introduced an initiative to promote paternity leave in 2003. This provides financial incentives for companies granting paternity leave, but it does not seem to have had the desired effect (Hosking, 2006).

The above studies have shown how developed nations have established strong policies that promote working fathers' involvement in child development programmes. It was therefore the assumption of this study that fathers who do not have enough paternal leave may not be effectively involved in their children's development such as cognitive development skills, hence the need to establish whether this was the case for Zambia, and in particular Kasama and Mungwi districts.

Civil society organisations in South Africa working to promote constructive male involvement and responsible fatherhood, are active and increasingly successful at enlisting

men and creating awareness. Some of the programmes introduced that encouraged participation in child development programmes are *Fathers Speak Out and Men as Partners* and *Against Domestic Abuse, Prevention and Training* (ADAPT). The programmes had their primary focus on reaching men and fathers. The programmes provided counselling on what men can and should be to their children (Peacock & Botha, 2006). Additionally, the Human Science Research Council in South Africa launched The Fatherhood Project in 2003, aiming to influence social expectations and perceptions about men and their care for children, create a sense of shared responsibility for children's development among men and women, engender broad-based and long-term commitment to men's involvement with children and rally peer and professional support to enable men to be more involved in children's lives. The council officially opened the project with a photographic exhibition that travelled the country, accompanied by debate and participatory events (Richter & Morrell, 2006).

In a study entitled "*Fathers Matter, Involved Fathers Change the Lives of Children*", Kauffman (2005) stresses that with the child's best interests in focus, Fathers' Groups (also called 'Papa Schools') were offering men with preparation for active parenting and more equal relationship with them. Separate fathers' group sessions were offered to interested men with antenatal care visits as an entry point. Father's groups were specifically directed to first-time fathers. According to experiences from fathering programmes, fathers' groups were preferably led by ordinary fathers who have been sufficiently trained for the purpose, and continuously guided and supported by professionals. Fathers' groups usually meet four to six times before the child is born and one to two times after birth. The topics discussed, amongst others were pregnancy, delivery, relationship (two becomes three), life puzzle, breastfeeding, child care and safety, raising children without corporal punishment and household tasks. The participants in the fathers' group often become role models and often enrolled more fathers, some of them were later trained as facilitators.

Still on father's groups, it has been noted that these groups have also been implemented in various countries, for example, Russia, Vietnam, Sweden and Ethiopia and that they have brought positive changes for men, women and children in all contexts. Fathers who have participated in Fathers' groups have shown greater commitment towards their children and wives and showed a greater responsibility economically and in household work in the family. Watson (1992) adds that the *U.S Fatherhood Education and Development* was formed and piloted in six US cities. It embraced a component of the Fatherhood Development

Curriculum. Men who participated in the project met once per week to discuss issues of motherhood and fatherhood. They were exposed to lessons and exercises which encouraged them to consider mothers' perspectives. An evaluation of the project, therefore, showed that 91 per cent felt that the fatherhood curriculum helped teach them parenting skills and improve their relationship with their children. Another programme or strategy involves bringing fathers into school and day care centres which their children attend to help with child care. The programmes were designed to increase the father's interaction, not simply have men build or paint. One such project was, "*Fathers-Child Nights*" at a daycare centre in New Mexico (U.S.). Fathers began by making toys with their children then they gradually began to play with them at the child's own level. Kavanaugh (1992) observed that the success of the programme was attributed to balancing discussions with activities, inviting participants to meet face to face, having male staff members, and entering into formal contracts with the fathers to attend the programmes.

The other strategy devised to increase fathers' involvement in child-rearing activities in the U.S. was to provide fathers with childcare leave, either paid or unpaid and more flexible work hours so that others can have more contact with their children. Even when such opportunities were made available, however, only about 10 per cent of fathers in the (U.S. & Sweden) used them. The non-usage of paternal child leave may be due to prejudice by employers, the desire of the wife to stay home, or loss of income for the father if leave is unpaid. (Eagle and Breaux, 1998). The other programme that was introduced to help fathers be involved in their children's development programmes is the Steps Toward Effective, Enjoyable Parenting (STEEP) programme. The STEEP programme works on the premise that secure attachment between a parent and an infant establishes ongoing patterns of health interactions. Parents are taught to understand their child's development, respond sensitively and predictably to their child's needs and make decisions that ensure a safe and supportive environment. This programme specifically targeted fathers' knowledge, skill and commitment to the fatherhood role. It also sought to increase the support given to mothers (Ancell, Bruns & Chitiyo, 2006).

2.8. Literature Gap

While there's increasing recognition of the importance of fathers and grandmothers in child rearing, several research gaps persist. There is a significant disparity in the volume of research dedicated to fathers compared to mothers in child-rearing activities, with fathers consistently underrepresented in participant populations. Many studies still primarily focus

on mothers' characteristics, overlooking the significant shifts in fathers' roles over recent decades. This study has explored the unique contributions fathers make independently in child-rearing activities. The study has further demonstrated how shared responsibility between fathers and grandmothers has influenced the cognitive development of children. One critical area needing further exploration, especially a longitudinal study is the influence of co-parenting dynamics on child outcomes when fathers and grandmothers are actively involved in child-rearing activities such as early childhood education, nutrition and childcare practices. Most of the previous studies were done in Western countries and focused on older children but the present study focused on children aged 5 to 6 years old. Lastly, the present study has used mixed methods which produced unique information on the influence of fathers and grandmothers on the cognitive development of children which one approach can not provide.

2.9 Chapter Summary

Chapter Two reviewed literature related to the study at hand. The literature was divided into levels of involvement by fathers and extended family members in child-rearing activities, the impact of fathers and extended family members' involvement in child-rearing activities, cognitively stimulating activities that enhance cognitive development skills among children and challenges in involving fathers and extended family members in child-rearing activities. The Chapter further discussed policies and programmes that enhance fathers' and extended family members' involvement in child-rearing activities. Lastly, the Chapter highlighted the gaps between the previous studies and the present study. The next Chapter discusses the methodology applied in the study.

CHAPTER THREE

METHODOLOGY

3.1 Overview

This Chapter describes the methods that were used to conduct this study. It begins with a discussion of the research paradigm which informed this study including ontological assumption, epistemological assumption, human nature, methodological assumption and research design. The Chapter also presents the study's location, target population, inclusion and exclusion criteria, sample size, sampling techniques and data collection instruments. It also tackles the pilot study and issues that arise therein, the data collection procedure as well as analysis of data. The chapter ends with a discussion of ethical considerations that were undertaken in this study.

3.2 Philosophical Paradigm

The study was informed by the assumptions of pragmatism. Pragmatics can combine both positivist and interpretivism positions within the scope of a single research depending on the nature of the research question. Secondly, the pragmatism research philosophy can integrate more than one research approach and research strategies within the same study (Punch, 2012).

Gub and Lincoln (2005) add that pragmatism accords individual researchers' freedom of choice to pick the methods, techniques, and procedures of research that best meet their needs and purposes. This study, therefore, employed a pragmatism paradigm because it provided the researcher with the freedom to use different techniques and methods to investigate the phenomenon under review by providing the best understanding of the research problem. In this study, the research problem was whether or not the involvement of fathers and grandmothers in child development programmes influences children's cognitive development. Another pragmatism assumption utilised in this study is ontology which is discussed in detail in the next section.

3.3 Ontological Assumptions

To explain and understand what reality looks like or what the world is and what it contains irrespective of the precise knowledge of it, the explanation is embedded in ontology (Lowe, 2007). In line with this, Realism and Nominalist were the ontological assumptions that informed this study. Realism as ontology holds that to determine what exists as reality, entities are endorsed universally by the scientific theory of the world and that reality is etic or given independent of the observer that exists outside the mind (Crotty, 1998). Based on this, the current study arrived at ontological assumption by conducting standardised assessments with the help of universally accepted instruments such as the Behavioural Rating Inventory for Executive Function (BRIEF), Pencil Tapping, Rapid Neurodevelopment assessment tool, Digit Span and the Peabody Picture Vocabulary Test.

On the other hand, Nominalists believe that reality is an emic view or that which is imprinted in the mind of the respondent or social actor (Guba & Lincoln, 2005; Greene & Hall, 2010). In the current study, the Nominalist ontology was realised through the use of open-ended questions in questionnaires with the respondents who gave different views and opinions on fathers' and grandmothers' participation in child-rearing activities and their influence on the cognitive development of children. The two ontological assumptions applied to the current study because it evoked the concurrent embedded design which has both quantitative and qualitative techniques of data analysis. The other pragmatism assumption the researcher utilised in this study was epistemology which is discussed in detail in the next section.

3.4 Epistemological Assumptions

Epistemology is that part of philosophy that asks what knowledge is and deals with the theory of knowledge which is concerned with the nature, sources and scope of knowledge (Greene & Hall, 2010). Therefore, both positivists and humanists were employed as epistemological assumptions in this study. Logical positivist epistemology claims that science aims at the explanation and prediction of observable phenomena by presenting these as derivable from general laws and that the truth or falsity of the statements intended to express such laws is determined by their relationship to statements describing empirical observable quantitative data. Logical positivism was standard through the use of standardised cognitive assessment tools used to assess the cognitive development of children. On the other hand, a complement of the humanist as an epistemology under the qualitative sphere suggests that humans are

mechanistically determined by situations of the external world with experiences as products of their environments. This implies that they are conditioned by external circumstances which are rich with probing the meaning and purpose of life in terms of knowledge (Burrell *et al.*, 1991). In this study, the humanist epistemology was the knowledge that surrounded the reactions in terms of experiences, opinions and views of the participants as a result of being exposed to open-ended questions in the questionnaire. The qualitative assessment entailed fathers and grandmothers rating their involvement in child-rearing activities and their influence on the cognitive development of children through Likert scale questions in the questionnaires as well as putting forward some challenges faced in being involved in child-rearing activities and suggesting strategies that could improve their involvement in child-rearing activities.

3.5 Human Nature Assumptions

The human nature assumption is concerned with the implicit or explicit model of humans and their relationship with their environment. Burrell *et al.* (1991) characterise the two opposing views of how people view the nature of human beings as either deterministic or voluntaristic. This study used both determinism and voluntarism as strands of human nature. Determinism refers to people's behaviour being determined for them by some external force as far as they lack originating powers as actors. Determinism is further used to describe the position that causes and effects are related to by-laws that exist outside of human subjectivity or action (Tashakkori & Teddlie, 1998). This principle of causality is a central concept in natural science and tends to explain that laws or social facts determine all social actions and man has no control over them.

Deterministic postulates that humans are mechanistic, determined by the situations in the external world, meaning that human beings and their experiences are products of their environment and that they are conditioned by external circumstances. In the current study, determinism as a strand of human nature was achieved by exposing the participants to the already structured questions or standardised instruments such as BRIEF, Pencil Tapping, Rapid Neurodevelopment assessment tool, Digit Span and the Peabody Picture Vocabulary Test whose originality came from different countries but were already standardised and used for cognitive assessment in Zambia among children.

Voluntaristic is a free-will view that individual decision-making is not affected by external factors (Brown, 1994). In this view, free will, empowerment, morale and culture are cardinal concepts in the current version of voluntarism. The voluntarist approach ascribes a much more creative, free-will approach to humans, treating them as agents able to create their environment through their thoughts and actions (Glor, 1998). The current study appreciated voluntarism as a form of human nature by persuading the participants through a consent form that allowed them to have the free will to decide whether to take part in the study. The emphasis was on the concept of voluntary participation without coercing them and that they were free to withdraw their participation in the study anytime they so wished. This was further appreciated when participants used their free will in making decisions to answer questions. The other pragmatism assumption the researcher utilised in this study was methodological assumption which is discussed in detail in the next section.

3.6 Methodological Assumptions

The idiographic methodology is meant for qualitative research and is concerned with exploring uniqueness by using a realistic method that seeks to comprehend phenomena in context-specific settings. The idiographic methodology takes a subjective emic view of the world and regards experiences as a basis for knowledge as researchers seek instead to illuminate, understand and extrapolate similar situations (Patton, 2001; Tashakkori & Creswell, 2007). The principle concern is to understand the way an individual creates, modifies and interprets the world. This entails that the experiences are seen as unique and particular to the individual (Flood & Jackson, 1991). The current study sought to invoke the idiographic methodology by accommodating unique experiences that Zambian fathers and grandmothers shared after being involved in child development programmes. This entailed that Zambian fathers and grandmothers had a subjective emic view as imprinted in their minds on how their involvement in child-rearing activities could influence the cognitive development of children.

Table 1: A summary of the two axes at the core of the Concurrent embedded design as adopted by the current study

Concurrent embedded design blends both quantitative and qualitative data to provide a researcher with relevant and accurate information.

Descriptive Survey		
Etic View	Two Axes	Emic View Subjective
Realist	Ontology	Nominalists
Positivists	Epistemology	Humanists
Determinist	Human Nature	Voluntarist
Nomothetic	Methodological	Idiographic

Source: Adapted from Brunnell and Morgan (1991)

3.7 Research Design

A Research design is the researcher’s choice of the best way in which to answer a research question, concerning several considerations, including several subject groups, timing data collection, and research interventions (Gray, Grove & Sutherland, 2017). The research design selected for this study was a concurrent embedded design. Concurrent embedded design research design is well-suited for mixed methods studies because it enables the simultaneous collection and integration of diverse types of data, facilitates triangulation, and improves research efficiency (Beck & Polit, 2017). This design allows researchers to address multiple research questions within a single study and to use secondary data to contextualize or explain the primary findings.

3.8 Location of the Study

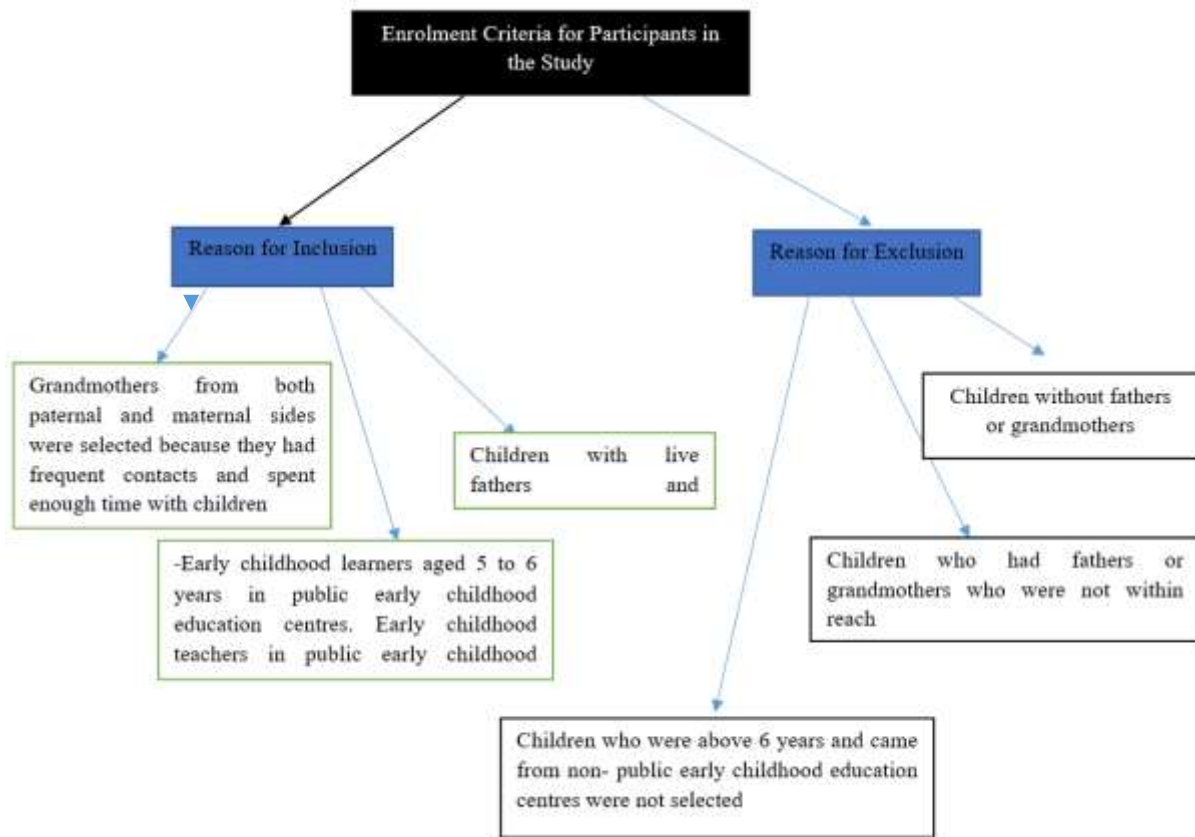
Msabila and Nalaila (2013) state that various factors can influence the researcher’s choice of the study area among them are the nature and incidence of the problem, research time frame, data accessibility, clients’ interest, instructions, resource availability, goals and objectives of the study. As such, this study was conducted in the Northern province of Zambia in particular Kasama and Mungwi districts. The Provincial Centre for Northern province which is Kasama district is 865 kilometres from Zambia’s capital city Lusaka. The people in those districts have different socio-economic statuses (SES) but they have similar cultural values and beliefs. The choice of the location hinged on issues of familiar language used by the researchers. The districts have three typical strata namely urban, peri-urban and rural areas

which made the study interesting. The chosen study areas were also a cost-effective measure to the researcher because the two districts are 25 kilometres apart from each other.

3.9 Target Population

The target population is the entire set of individuals or elements meeting the sampling criteria. The population is the set of all members of a defined group, it contains elements that share at least one characteristic (Punch, 2012). The target population for this study was early childhood education teachers, fathers with children of ages ranging from 5 to 6 years old who were in public early childhood education centres, children aged 5 to 6 years old attending early childhood education in public early childhood education centres and grandmothers from both maternal and paternal sides in Kasama and Mungwi districts.

Figure 1: Flow Chart for Inclusion and Exclusion Used in the Study



3.10 Sample Size

A sample can be said to be a smaller group or subset of the accessible target population. It has characteristics of a larger group or population (Kombo & Tromp). It is carefully selected to be representative of the whole population. Kasonde-Ng'andu (2013) corroborates the previous explanation when she explains that a sample is a subset of the population taken to be representative of the whole study population. The sample for this study comprised three hundred and ten (310) participants consisting of 100 fathers, 100 grandmothers, 100 children and 10 Early Childhood Education teachers (ECE) from different communities and public early childhood education centres in Kasama and Mungwi districts. Fathers and grandmothers who participated in the study had their grandchildren also take part in the study.

Cohen's formula was used to arrive at the above sample.

Cohen's formula is a statistical power analysis, that serves as a pivotal tool in determining the appropriate sample size for research studies across various disciplines (Cohen, 1992). Sample size determination is a critical step in designing a research study, influencing the study's ability to detect meaningful effects and ensuring the reliability of the findings (Wolf, Harrington, Clark and Miller, 2013).

The formula is as follows:

$$n = \frac{(z_{\alpha/2} + z_{\beta})^2 \cdot (1 + R^2)}{d^2 \cdot R^2}$$

Where

n = Required sample size,

$z_{\alpha/2}$ = z -value corresponding to the **desired confidence level** (for 95% confidence,

$z_{\alpha/2} = 1.96$),

z_{β} = corresponding to the **desired power** (for 80% power, $z_{\beta} = 0.84$),

R^2 = **Coefficient of determination** (the proportion of variance explained by the regression model, which ranges from 0 to 1),

d^2 = **Effect size** (Cohen's d , the expected size of the effect, the standard deviation of the difference between groups).

Calculation.

$$n = \frac{(z_{\alpha/2} + z_{\beta})^2 \cdot (1 + R^2)}{d^2 \cdot R^2}$$

$$n = \frac{(1.96 + 0.84)^2 \cdot (1 + 0.25)}{(0.356)^2 \cdot (0.25)}$$

$$n = \frac{(2.8)^2 \cdot (1.25)}{(0.126736) \cdot (0.25)}$$

$$n = \frac{(7.84) \cdot (1.25)}{0.030625}$$

$$n = \frac{9.8}{0.031684}$$

$$n \approx 309.30439$$

Therefore we can have $n = 310$

3.11 Sample Demographic Characteristics

The demographic characteristics of the participants are presented in segments of each category; children, fathers and grandmothers.

Table 2: Children Demographics; Gender, and Age of the Children

Children	Gender	Percentage	Age	
			5 Years	6 Years
	Boys	44	21	23
	Girls	56	25	31
	Totals	100	46	54

Table 2 above shows that there were more girls (56%) than boys (44%) who participated in the study. Furthermore, 21 boys were aged 5 years old while 23 of them were aged 6 years old. Conversely, 25 girls were aged 5 years while 31 of them were 6 years old. This participation did not affect the study because the children were within the age limits for early childhood education entrance policy in public early childhood education centres in Zambia.

Table 3: Father's and Grandmothers' Demographics; Age Range; Home Location, Level of Education

	Age Range		Home Location		Level of Education	
Fathers	<24 years	1	Urban	65	Never been to school	1
	25-29 years	22	Peri-urban	18	Completed Primary Education	24
	30-34 years	29	Rural	17	Completed Secondary Education	46
	35-39 years	28			Higher than Secondary Education	29
	40-44 years	14				
	>46	6				
Total		100		100		100
	Age Range		Home Location		Level of Education	
Grandmothers	<45 years	7	Urban	65	Never been to School	29
	46-50 years	17	Per-Urban	18	Completed Primary Education	24
	51-54 years	16	Rural	17	Completed Secondary Education	15
	55-60 years	43			Higher than Secondary Education	3
	>66 years	3				
Total		100		100		100

The majority of fathers were aged between 25 to 44 years. The majority of grandmothers were aged between 46 to 65 as shown in Table 3.

The table further presents the location of the participants in the districts and their highest levels of education. Table 3 also shows that 65% of fathers and grandmothers were from urban areas such as Kasama urban, Lualuo and Chipoya. Meanwhile, 18% of them were from per-urban areas such as Luyeye and 17% of them came from rural such as Itinti and Lwabwe.

On levels of education of fathers and grandmothers who participated in the study, the majority of fathers 46% had completed secondary school level, 29% of them had higher than secondary level school, 24 of them had only completed primary level and one parent did not attend any school. Meanwhile, only 3% of grandmothers had gone above secondary school level, 15% of them had completed secondary level, 53% of them had only completed primary school level and 29% did not attend any school.

Table 4: Employment Status of Fathers

	Employed	Not Employed	Total
Employment Status	52	48	100
For Fathers			

Table 4 shows the employment status of fathers who participated in the study. The table clearly shows that 52% of the respondents acknowledged being in employment while 48% of them were not employed.

Table 5: Type of Family for Fathers and Grandmothers and Number of Household Members

	Nuclear Family	Extended Family	Single Parent	Total
Types of Family				
Fathers	25%	66%	9%	100
Grandmothers	2%	97%	1%	100
	1-3 Members	4-6 Members	More than 6 Members	Total
Number of Households Members				
Fathers	12%	58%	30%	100
Grandmothers	2%	48%	50%	100

Table 5 presents the family type of fathers and grandmothers. Table 5 clearly shows that 25% of the fathers had only 2% of grandmothers had nuclear families. Meanwhile, 66% of the fathers and 97% of grandmothers had extended families. Last but not least, 9% of the fathers and 1% of grandmothers were living as single-parent families. Thus, the study was heavily dominated by extended families from both grandmothers and fathers respectively.

Further, the table depicts the number of household members living with both fathers and grandmothers. 12% of the fathers and 2% of grandmothers had 1-3 family members, 58% of the fathers and 48% of grandmothers were living with between 4-6 members, and 50% of the grandmothers and 30% of fathers said they kept more than six (6) members in their household. The study revealed that grandmothers resided with bigger family members as compared to fathers.

3.12 Sampling Procedure

A sampling procedure is a process of selecting a group of people, events, behaviour, or other elements that represent the population being studied. Sampling itself is a process of drawing a sample from the population. Sampling enables a researcher to collect and analyse data for a smaller portion of the population, which must be representative of the entire population and then apply the results to the whole population. It also permits a researcher to conclude very complex situations. Sampling further provides details regarding the application of a sampling method in a specific study (Punch, 2012). Three sampling techniques were applied in the selection of participants in public early childhood education centres and communities in Kasama and Mungwi districts for this study. These were stratified random sampling, criterion purposive sampling, and simple random sampling.

The stratified random sampling technique was used to select ten public early childhood education centres. This technique involves grouping early childhood education centres and communities into three geographical locations: urban, peri-urban and rural areas. The early childhood education centres and communities from each of these groups were randomly selected to arrive at early childhood education centres and communities to participate in the study. The use of stratified random sampling in this study was important in that different communities and schools served as representative samples.

Early childhood learners present in early childhood education centres at the time of the visit by researchers were organised according to their classes and a simple random procedure was

conducted in each class to make sure learners had an equal and independent chance of being selected as members of the sample. The learners who had grandmothers and fathers were grouped into one group. The researcher then put numbers from one to twenty in a bowl and learners who picked numbers from one to ten became participants. Learners who did not have grandmothers or fathers within their reach did not participate in the study.

A criterion purposive sampling procedure was used to select early childhood education teachers, grandmothers and fathers who had children and grandchildren in public early childhood education centres. In criterion purposive sampling, researchers select participants based on specific criteria or characteristics that are essential to the research question (Creswell, 2009). In this case, Teachers, fathers and grandmothers were purposively selected in this study because they had frequent contacts and spent much of the time with children both home and school. Additionally, teachers, fathers and grandmothers were involved in child development programmes. This sampling procedure enabled the researcher to consciously select participants to be included in this study.

3.13 Data Collection Procedure

The researcher sought permission to collect data from the participants by getting Ethical Clearance from the Directorate of Research and Graduate Studies at the University of Zambia. The researcher also got permission from the District Education Board Secretary (DEBS) to conduct research in respective schools. The structured questionnaires were administered to fathers and grandmothers who could read and write, while for those who could not read and write, the researcher or assistant researcher was able to read for them. To facilitate the data collection procedure, a voice recorder was used to record the conversation between the researchers, fathers and grandmothers during the interview. Each interview lasted about 30 minutes. The researcher or assistant researchers also conducted an assessment of children in early childhood education centres in a secluded room (office). During the session, no other pupils were present apart from the ones who were taking the test and the person conducting the test. This was done in that manner to avoid disruption of the pupils in any way by other present stimuli. The testing took about 45 minutes per child.

The first test was the Rapid Neurodevelopmental Assessment Test (RNDA), followed by the Pencil tapping test. These tests were followed by the Digit span test, PPVT, familiar language test and pattern reasoning although these were not done in any particular order.

Teachers rated the children's executive functions (BRIEF). Specific domains that were rated in the questionnaire included working memory, inhibitory control, shift, emotional control and organisation and planning.

Assistant researchers were oriented and trained for two days on how to administer the test by the principal researcher. An adequate explanation on how to answer the BRIEF was given to the teachers who filled in the BRIEF. They were told the exact way how to rate the children and the meaning of each sub-scale on the BRIEF.

3.13.1 Assistant Researchers

Assistant researchers underwent training for two days on test administration. The training was done by the principal researcher. The teachers who filled in the BRIEF were adequately explained to on how to answer the BRIEF that is, they were told the exact way to rate the children and the meaning of each subscale on the BRIEF. The Behavior Rating Inventory of Executive Function is a standardized questionnaire designed to evaluate executive functions in individuals across different age groups and settings. It offers a comprehensive assessment of executive functions through questionnaires completed by parents, teachers, or the individuals themselves (self-report), providing valuable insights into daily behaviours associated with executive function deficits. The BRIEF typically includes multiple scales or subscales that measure different aspects of executive functions, such as inhibition, shifting, emotional control, working memory, planning/organization, task monitoring, and organization of materials. These scales provide a detailed profile of an individual's strengths and weaknesses in various areas of executive functioning. Scores on the BRIEF are usually standardized, allowing for comparison to normative samples based on age and gender, which facilitates the identification of clinically significant executive function difficulties. Further, the interpretation of BRIEF results involves examining the scores on each scale and comparing them to normative data to determine whether they fall within the average range or indicate significant impairment. Elevated scores on specific scales suggest difficulties in those particular areas of executive functioning, while a pattern of elevated scores across multiple scales may indicate a more generalized executive dysfunction (Klarin, Hoff, Larsson, and Daukantaité,2024: Lima, Peckham and Johnson,2017). For example, assistant researchers (teachers) were told to rate by stating Never=0 Sometimes=1 and Often=2.

3.14 Research Instruments

The study used eight research instruments for data collection. These were Structured Questionnaires for fathers and grandmothers, a Biographical Data Form and a Cognitive Battery consisting of a Rapid Neurodevelopmental Assessment tool (RNDA), Digit Span, Peabody Picture Vocabulary Test, Pencil Tapping Test and Behavioural Rating Inventory for Executive Functions (BRIEF).

3.15.1 Background (Biographical Data Form)

This research instrument was used to generate biographical data of each child such as personal details (name, age, home language and sex). This information allows researchers to discern patterns, relationships, and potential confounding variables that might influence the outcomes of a study, thereby enhancing the validity and generalizability of findings. The administration of biographical data collection requires careful consideration of ethical principles, data privacy, and the potential burden on participants. Researchers must ensure that the process is transparent, voluntary, and respectful of participants' autonomy. This involves obtaining informed consent, clearly explaining the purpose of data collection, and outlining how the information will be used and protected. This activity was done by fathers before the other instruments were administered to the children. For those who could not write, the researcher or assistant researchers helped them to fill in the biodata. This instrument has been widely used by different scholars in Zambia (Matafwali 2010; Mwanza-Kabaghe 2015; Mwanza-Kabaghe 2022). The instrument was contextualized to the Zambian situation. This activity was done by fathers before the other research instruments were administered to the children. The research instrument also included the home possession index (HPI). The HPI had twelve items and participants were required to respond with either 'yes' (1) or 'no' (0) to the items. An example of the ten items on the HPI included asking the respondents the following questions:

1. Do you have a television in your home?'
2. Do you have a stove in your home?'
3. Do you have electricity at home?
4. Do you have running water at home?

5. Do you have a flushable toilet?
6. Do you have a car at home?
7. Do you have at least two pairs of clothes?
8. Do you have at least one pair of shoes?
9. Do you have a bed with a mattress to sleep on?
10. Do you live in a house with cement or tile floors?

A total score was computed by summing up the item scores for all items.

3.15.2 Structured Questionnaires

A questionnaire is a written self-report form designed to elicit information from research participants through written responses. It is a research instrument used by a researcher to the gather data over a large sample in a more accurate manner (Beck & Polit, 2017; Kasonde-Ng'andu, 2013). Structured questionnaires were used for collecting data from the fathers and grandmothers with children or grandchildren of ages between 5 to 6 years old attending ECE. Through the use of structured questionnaires, the researcher was able to assess the views of the fathers and grandmothers regarding their involvement in child-rearing activities. In this study, fathers and grandmothers were considered to possess valuable information on parenting regarding child-rearing activities. An example of questions in the questionnaires for grandmothers were:

- (i) Is fathers' or grandmothers' involvement in early childhood education practices seen as essential in the acquisition of cognitive skills among children? If your answer is 'YES', kindly explain more.
- (ii) From your experience as a father or grandmother, what challenges have you seen in your child or grandchild as a result of being involved in early childhood education practices?
- (iii) Based on your experience as a father or grandmother, what challenges do you face in being involved in child-rearing activities?

- (iv) In your opinion, how can you improve fathers' or grandmothers' involvement in child-rearing activities such as child care, nutrition and early child education practices?

In a situation where participants were unfamiliar with the use of the English language as a medium of communication, questions were translated before data collection into a familiar language used in the two study areas 'Icibemba' to enable them to follow and understand the questions before responding to them. Fathers' and grandmothers' responses that were collected through the use of the local language were translated into English in readiness for data analysis and interpretation.

3.15.3 Semi-Structured Interview Guide

In addition to the structured questionnaire, the study utilised semi-structured interview guides to collect data from fathers and grandmothers. The semi-structured interview guide is a set of questions which are personally and verbally given (Sidhu, 2013). The semi-structured interview guide was chosen because of its ability to probe, determine attitudes, discover the origin of the problem and involve the interviewee in an analysis of the problem. Punch (2012) adds that a semi-structured interview is a good way of assessing people's perceptions, meanings, definitions of situations and constructions of reality. It is one of the most powerful ways researchers understand others. Therefore, the semi-structured interview is a flexible research instrument because it makes the general outline to be followed but within each section, the questioning is free, open-ended and full according to the choice of the interviewer. Qualitative data was collected using this instrument.

3.15.4 Cognitive Assessment Tools

To assess the cognition of children in the study, a battery of cognitive assessment tools that have previously been used in Zambia were administered. These included the Rapid Neuro Development Assessment tool being utilized at the University Teaching Hospital (UTH) and the University of Zambia (UNZA) assessment centre, the Digit Span for short-term memory, the Peabody Picture Vocabulary test for receptive language and the Behavioural Rating Inventory for Executive Function (BRIEF) as well as Pencil Tapping tests for assessing executive functioning. These assessment tools have previously been used in Zambia (Matafwali (2010), Mubanga (2015), Mwanza-Kabaghe (2015), Kabundula *et al.* (2022),

Mbewe *et al.* (2022), Mwanza-Kabaghe (2022). A detailed explanation of each cognitive tool is given below.

3.15.4.1 Rapid Neuro-development Assessment Tool (RNDA)

The Rapid Neuro-developmental Assessment (RNDA) is a tool designed to detect functional status and neurodevelopmental impairments (NDIs) across multiple neuro-developmental domains. Khan *et al.* (2010) explained that the RNDA can be used by a professional from a range of backgrounds with high reliability and validity for determining the functional status of children. In this study, the screening measures were brief tests to determine whether the child was at risk for developmental problems in one or more areas (for example, expression language, cognition and behaviour). These measures were scores or a qualitative determination of whether the child was at risk for difficulty. The RNDA has been used in low- and middle-income countries (LMIC), for example in Dhaka, Bangladesh and has shown tremendous potential (Clikeman *et al.*, 2017), although not documented in research the RNDA is also used at the University of Zambia and the University Teaching Hospital to assess children's development and is indicative of children neurodevelopment. In this study, the concentration was on the cognitive domain as the study endeavoured to assess the influence of child-rearing activities on the cognitive development of preschoolers.

Before commencing the assessment, it was important for the researcher or assistant researchers to establish a rapport with the children in this study especially those with cognitive impairments. This involved creating a comfortable and supportive environment that minimizes anxiety and encourages optimal performance. Detailed manuals containing guidelines on administration procedures, scoring criteria, and normative data were used. Children were assessed in two components namely cognition and expressive language. The cognitive component of the RNDA encompasses tasks evaluating memory, attention, problem-solving, and recognizing shapes. Administering these sections requires careful attention to detail, ensuring that children understand the task demands and are provided with sufficient time to respond. The expressive language component of the RNDA involved tasks assessing vocabulary, grammar, and sentence construction. In this section, it was important to create a context that encourages natural and spontaneous language production. The examiner provided clear and concise instructions, allowing children to express themselves freely without undue pressure or interruption.

3.15.4.2 Digit Span

The forward and backward condition of the Digital Span sub-test from the Wechsler Intelligence Scale for Children-III (Wechsler, 1991) assesses working memory as a cognitive skill. This study used both the Digit Span Forward and the Digit Span Backward to assess the children's working memory. The Digit Span Forward requires the child to repeat numbers in the order as read aloud by the examiner or researcher, and the Digit Span Backward requires the child to repeat numbers in the reverse order that is presented by the examiner or researcher. The task requires that participants listen to a series of digits and repeat the series in the correct forward or backward order (Carina & Donald, 2007).

In this study, the numbers were read by the researcher at the rate of one per second. The researchers used a stopwatch and matched the total presentation time to the number of stimuli (e.g., 5 numbers should take 5 seconds to say). Two trials were presented at each level of difficulty. The presentation began with two digits in a series. As the level of difficulty increased, the number of digits presented in the series increased by one to a maximum of nine. The test was discontinued when both trials at a given level of difficulty were incorrectly called. One point was allocated for each correct response for a maximum of 18 points. Because it is a working memory subtest, repetition was not allowed on the digit span. Therefore, The Digit Span forward is a good measure of simple attention, and most healthy individuals perform within seven plus or minus two spans of the apprehension range while the Digit Span Backwards represents a qualitatively different type of task that relies more on working memory skills that should be considered separately from digits forward (Carina & Donald, 2017).

3.15.4.3 Receptive Language

3.15.4.4 The Peabody Picture Vocabulary Test (PPVT)

This was used as a measure of receptive vocabulary. It is a verbal language learning instrument that was meant to test each child's knowledge of common items in the environment. The Peabody Picture Vocabulary Revised version was translated into *IciBemba*. The test consisted of thirty items which were adapted to the *Zambian* context. The children were shown groups of four pictures and asked to point at the one representing the meaning of a spoken word described by the researcher in *IciBemba*. The responses were marked as correct or incorrect. The PPVT has been used by many researchers because it is fast, easy to

apply, and has been adapted for use in different languages. This test has been previously used in Zambia by (Matafwali, 2010; Mwanza-Kabaghe, 2015; Mwanza-Kabaghe, 2022).

3.15.4.5 Executive Function Test

Two research instruments were used to assess the executive functioning skills of children in this study namely, the Pencil Tapping Test and Behavioural Rating Inventory for executive function (BRIEF). Executive function skills refer to a set of cognitive skills that are responsible for planning, organising, initiating, monitoring and regulating behaviour. These skills are essential for problem-solving, decision-making and adapting to changing circumstances (Toplak, West & Stanovich, 2013).

3.15.4.6 Pencil Tapping Test (opposite Tapping)

The pencil tapping test (opposite tapping) was used to measure attention and focus. The researcher opted to use a pencil-tapping test because it is a simple assessment test that takes the form of a game played between the child and the assessor. The assessor and each child had a pencil (Okello *et al.*, 2010). The child was instructed that when the assessor taps his pencil once, the child had to tap twice or vice-versa thereby, inhibiting his or her natural response to mimic the experimenter's behaviour. After a series of up to six practice trials in which the examiner provided feedback to the child, twenty scored trials without feedback were done. This test was previously used in Zambia by (Mwanza, 2011; Mwanza-Kabaghe, 2015; Mubanga 2015 & Mwanza-Kabaghe, 2022).

3.15.11 Behavioural Rating Inventory for Executive Function (BRIEF)

The Behavioural Rating Inventory of Executive Function (BRIEF) is a standardised measure used to assess executive function skills in children and adolescents aged between 5 and 18 years. The BRIEF consists of a series of rating scales that are completed by parents and teachers. The scales assess various domains of executive function including inhibition, shifting, emotional control, initiation, working memory, planning or organisation and monitoring (Gloria, Isquith, Guy & Kenworthy, 2000).

Toplak, West and Stanovich (2013) add that BRIEF is widely used in clinical and research settings to identify executive function deficits, track changes in executive function over time and evaluate the effectiveness of interventions designed to improve executive function skills. BRIEF has been validated for use in diverse populations including Zambia and is available in

multiple languages. The BRIEF was used to get information about everyday behaviour associated with specific domains of executive functions of children in the study. The early childhood education teachers reported problems with different types of behaviour related to each of the domains.

The assessment of activities in the BRIEF involves considering the context in which the behaviours occur, as executive function demands may vary depending on the situation. For example, an individual may exhibit adequate executive functioning in a structured classroom setting but struggle in less structured environments, such as during free play or unstructured social activities. It is also important to consider potential co-occurring conditions, such as attention-deficit/hyperactivity disorder, learning disabilities, or mood disorders, as these can impact executive functioning and influence BRIEF. Early childhood education teachers assessed children in all domains. There were sixty-three items in the BRIEF instrument. They rated activities in each domain by stating Never=0 Sometimes=1 and Often=2. The following were the areas in which children were assessed:

The Inhibition scale assessed the children's inhibition control and impulsivity. Inhibitory control helps children to focus on what they perceive as important, suppressing attention to other things or stimuli, for instance, concentrating on reading and ignoring other stimuli such as children playing outside the classroom. In the classroom, children with inhibitory control difficulties may easily be distracted, stop an activity before completing and do what they perceive as more attractive and start an activity or task before listening to instructions.

The shift scale assessed the child's ability to move from one activity to another and the ability to solve problems in a classroom activity.

The emotional control scale measured emotional expression and assessed a child's ability to modulate or control his or her emotions.

The working memory scale measured the children's capacity to hold information in mind to complete a task. Working memory is important for the completion of mental manipulations such as mental arithmetic and following complex instructions. Children with deficits in working memory skills have difficulty grabbing and holding on to incoming information. This means they have less material to work with when performing a task.

The planning and organisation scale measured the child's ability to anticipate future events; set goals; develop steps and grasp main ideas. Planning and organisation skills are essential in helping one achieve, keep focused on doing the right tasks and set priorities. The scale is comprised of two components namely plan and organise. The planning component allows one to anticipate what will happen next in an activity, the organisation component, on the other hand, entails the ability to information in order, learn or communicate information.

3.16 Reliability and Validity

Kombo and Tromp (2009) define reliability as a measure of the degree to which a data collection instrument can provide consistent results. It is concerned with the precision, reproducibility, and comparability of a measurement method.

To ensure reliability in this study, the instruments were piloted in two schools and communities to strengthen them before the actual collection of data. Cronbach Alpha Reliability test was also done on the questions to be administered to the fathers and grandmothers. In addition to that, the pre-testing of instruments in this study was aimed at finding out whether questions in the instruments were able to assess various specific areas of the extent to which fathers and grandmothers as extended family members were involved in child-rearing activities. This process helped the researcher clean the structured questionnaires and semi-structured interview guide before the actual study was carried out.

The Neurodevelopmental assessment tool, the biographical data form which assessed home possession Index, Digit Span, Peabody Picture Vocabulary Test, Pencil Tapping Test and Behavioural Rating Inventory for Executive Functions have previously been reported to be valid for use in Zambia by several studies (Mubanga, 2015; Mwanza-Kabaghe, 2015; Mwanza-Kabaghe, 2022; Adams *et al.*, 2022; Mbewe, *et al.*, 2022; Kabundula, *et al.*, 2022).

Validity indicates the extent to which an instrument reflects or can measure the construct being examined. In other words, validity in an instrument is an indication of the degree to which results obtained from the analysis of data can represent the trueness of the situation on

the ground, thereby making it possible to respond to a research problem. Below is Table 4 indicating the reliability of instruments used to assess cognitive skills in children.

Table 6: Cronbach Alpha Reliability Scale for Instruments Used to Assess Cognitive Skills in Children

Testing Tool		Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	Number of Items
BRIEF		.96	.96	63
	Trial Forward	.80	.85	8
DIGIT SPAN	Trial Backward	.80	.80	9
PPVT		.75	.75	30
PENCIL TAPPING		.85	.85	20
	Expression	.96	.97	9
RNDA	Cognitive	.61	.63	10

Cronbach's Alpha reliability coefficient normally ranges between zero and one. The closer the coefficient is to 1.0, the greater the internal consistency of the items (variables) in the scale. Cronbach's Alpha coefficient increases either as the number of items (variables) increase or as the average inter-item correlations increase (i.e. when the number of items is held constant).

In the Table above, reliability statistics were performed on BRIEF, Digit Span, PPVT, Pencil Taping and RNDA for the internal consistency of the items or variables. Regarding the Digit Span test, two trials namely, Trial forward with Cronbach's Alpha coefficient of 0.80 and 0.85 Cronbach's Alpha Based on standardised items indicated that there was a strong significant internal consistency on the forward trial. For Trial Backward, it was clear that a Cronbach's Alpha coefficient of 0.80 demonstrates a strong significant internal consistency and also a 0.80 Cronbach's Alpha Based on standardised items.

The BRIEF test indicated a very strong significant internal consistency with Cronbach's Alpha coefficient of .96 and .90 Cronbach's Alpha based on standardised items conducted on

63 items altogether. Meanwhile PPVT tests also indicated a significant internal consistency with Cronbach's Alpha coefficient of .75 and .75 Cronbach's Alpha based on Standardised items conducted on 30 items. Furthermore, the Pencil Tapping test showed a very strong significant internal consistency with Cronbach's Alpha coefficient of .85 and .85 Cronbach's Alpha based on standardised items conducted on 20 items.

For the RNDA Test, two tests namely, Expressive Language with a very strong significant internal consistency with Cronbach's Alpha coefficient of .96 and .97 Cronbach's Alpha based on standardised items conducted on 9 items. Lastly, cognition had very weak internal consistency with Cronbach's Alpha Coefficient of .61 and .63 Cronbach's Alpha based on standardised items conducted on 10 items respectively.

3.17 Trustworthiness and Credibility

This being a mixed method of study both qualitative and quantitative data were collected and analysed, it was important to ascertain the trustworthiness and credibility of the study. The researcher used Guba's four trustworthy strategies which are ideal for all qualitative studies. Guba's four trustworthy strategies, also known as the criteria for trustworthiness are widely recognised as important for establishing rigor in qualitative research (Braun & Clarke, 2006).

1. One of the strategies the researcher used was credibility. Credibility refers to the extent to which the findings accurately represent the participants' experiences. To achieve credibility in this study, triangulation was done through the use of different instruments and ultimately a rich picture of fathers' and grandmothers' involvement in child development programmes and their influence on the cognitive development of their children was established. Fathers and grandmothers as participants were coded with alphabetic letters (e.g., Father = **A**, Grandmother = **J**). This process enhanced the confidentiality and trustworthiness of the study. It also helped to avoid bias in picking verbatim for presentation.
2. Transferability (external validity) was ensured through contextualising with other studies in which similar information was found and new information was added to the body of knowledge hence data quality was assured. The researchers also provided detailed descriptions of the research context, participants, and data collection procedure.

3. Dependability (reliability) was also employed by making the research instrument reliable by conducting a pilot study. The pilot study conducted determined the effectiveness of the proposed data collection process and the instruments. After a pilot study, the questions on the semi-structured interview guide which were not well phrased were rephrased while others were removed in readiness for the final data collection.
4. Confirmability was used through “bracketing” taking the information as it came from participants through verbatim reporting (Guba & Lincoln, 1994). Further, the researcher transcribed the interviews to ensure consistency in the findings and also to avoid any biases. The researcher employed this strategy to demonstrate that the findings were grounded in the data rather than influenced by biases or preconceived notions.

3.18 Data Analysis

Data analysis refers to examining what has been collected in a survey or experiment and making deductions in inferences (Kombo & Tromp, 2009). It involves scrutinising the acquired information and making inferences.

Quantitative data were analysed using SPSS. The data from structured questionnaires, RNDA Tools, Digit Span, Peabody Picture Vocabulary Test, Pencil Taping Test and Behavioural Rating inventory for Executive Functions were analysed quantitatively using the Statistical Package for Social Sciences (SPSS) version 23.0 to generate frequencies and percentages which were used to describe distributions of lone and summated variables. Below are the descriptive and inferential statistics performed:

1. For research question 1 in a questionnaire, the Likert responses were used in determining the involvement of fathers and grandmothers in child-rearing activities.
2. To establish the level of fathers' and grandmothers' involvement in child-rearing activities, the researcher transformed the responses for both fathers' and grandmothers' sections into three scales namely, 0=Low involvement, 1=Moderate involvement and 2=High involvement. This was a response to research question 2 in a questionnaire.
3. To ascertain the performance of children in different cognitive skills, the researcher used a t-test to compare the means of two groups of children in terms of performance

based on age and gender. This was an emerging analysis from research question 3 using cognitive assessment tools.

4. Linear regression was also used to determine the effect of fathers' and grandmothers' involvement in early childhood education programmes and their influence on the cognitive development of children. Regression lines $Y=25.819+ 1.744X$ (Fathers) and $Y=27.045+1.953X$ (Grandmothers) showed a positive correlation between fathers' and grandmothers' involvement in early childhood education practices and the cognitive development of children. This was a response to research question 3 using cognitive assessment tools.

Qualitative data from the semi-structured interview was analysed using thematic analysis. Thematic analysis is a widely used method for analysing qualitative data. It involves identifying and analysing patterns, themes, and meanings within the data to gain insights and generate findings (Sidhu, 2013). Data were then put into identified themes and categories after which interpretation and discussion were done thematically. During data analysis in qualitative research, the researcher considered the following steps according to Sidhu (2013).

1. The first step was familiarisation which means the researcher became familiar with the material by reading through the transcripts. This step was important in making corrections in the transcripts. At this stage data from the participants interviewed were transcribed by listening to the voice recorder. All participants' responses were written on paper.
2. The second step the researcher took to analyse data was to generate initial codes. Generating initial codes is a crucial step in the thematic analysis as it involves systematically identifying and labelling relevant portions of the data with codes. The researcher started this process with a small portion of the data. Selecting a manageable portion of the data, such as a single interview transcript helped the researcher to maintain focus and manage the coding process effectively. The assigned codes were brief, concise and meaningful and were applied consistently across the selected portion of the data.
3. Searching for themes was the third step undertaken in thematic analysis. This step is important in the thematic analysis as it involves reviewing and organising the generated codes into themes. The researcher looked for patterns, connections or similarities between codes.

4. The fourth step was to review and define themes. This process involves careful examination of the coded data to refine and define the themes that emerged. The researcher started by reviewing the coded data, including the assigned codes and the corresponding units of data they represented.
5. The fifth step was defining themes. Here the researcher provided clear and concise descriptions of each theme that captured the essence of the coded data. Write-up or reporting the findings was the sixth step in thematic analysis. This step involves presenting and discussing the identified themes in a clear and organised manner. The detailed report provided quotes or examples from the data to support the interpretations.

3.19 Ethical Considerations

This study took into consideration ethical issues. Firstly, the researcher sought ethical clearance from the University of Zambia Humanities and Social Sciences Ethics Committee with clearance number HSSREC-2020-AUG-002. Secondly, permission was sought from the participants to find out whether or not they were willing to participate in the study.

The researcher then ensured anonymity by making sure that the names and personal details of participants were not revealed or published. Permission was sought from parents to assess children. Permission was also sought from the Ministry of Education through the DEBS to conduct the study in respective schools. The participation of respondents in this study was voluntary and participants were informed that they were free to withdraw from the study at any point. The data which was collected was kept confidential and only used for research purposes.

3.20 Chapter Summary

Chapter Three described the methodology that was used for collecting the required data for the study. It provided highlights on the research design, population, sample and procedure used to generate the information required to support the study. A justification and description of the research instruments, data collection procedure and how analysis of data was done, have also been discussed to help the reader understand how the findings of the study were arrived at and to help prospective researchers who may wish to replicate this study in other settings. The chapter ended by providing ethical considerations that were adhered to during research. The next chapter discusses the presentation of the findings.

CHAPTER FOUR

PRESENTATION OF THE FINDINGS

4.1 Overview

Chapter Four presents the study findings. Data was collected through the use of structured questionnaires and child assessment tools respectively. Data analysed quantitative and qualitative are presented through Charts, Frequencies, Tables and Graphs. The research findings are presented based on Child-rearing activities that Zambian fathers and grandmothers are involved in; Levels of involvement of fathers and grandmothers in child-rearing activities; Fathers' and grandmothers' involvement in early childhood education practices as child-rearing activities and these affect cognitive development skills among children; Activities in child-rearing practices which influence cognitive development skills of children and highlights the challenges faced by fathers and grandmothers in their involvement in child-rearing activities in Kasama and Mungwi districts.

4.2 Results

4.3 Child Rearing Activities that Zambian Fathers and Grandmothers are involved in

In line with the first objective of the study, this section presents child-rearing activities that Zambian fathers and grandmothers in Kasama and Mungwi districts are involved in. The response criteria used in determining the involvement of fathers and grandmothers in child-rearing activities were based on a Likert scale. The responses were five including Very often, Quiet often, Sometimes, Almost Never and Never. The responses: Very often, Quiet often and Sometimes were combined to give a yes response on the Likert scale, while Almost never and Never gave a no response. Figure 2 below shows the responses.

Figure 2: Fathers and Grandmothers' Involvement in Nutritional Activities

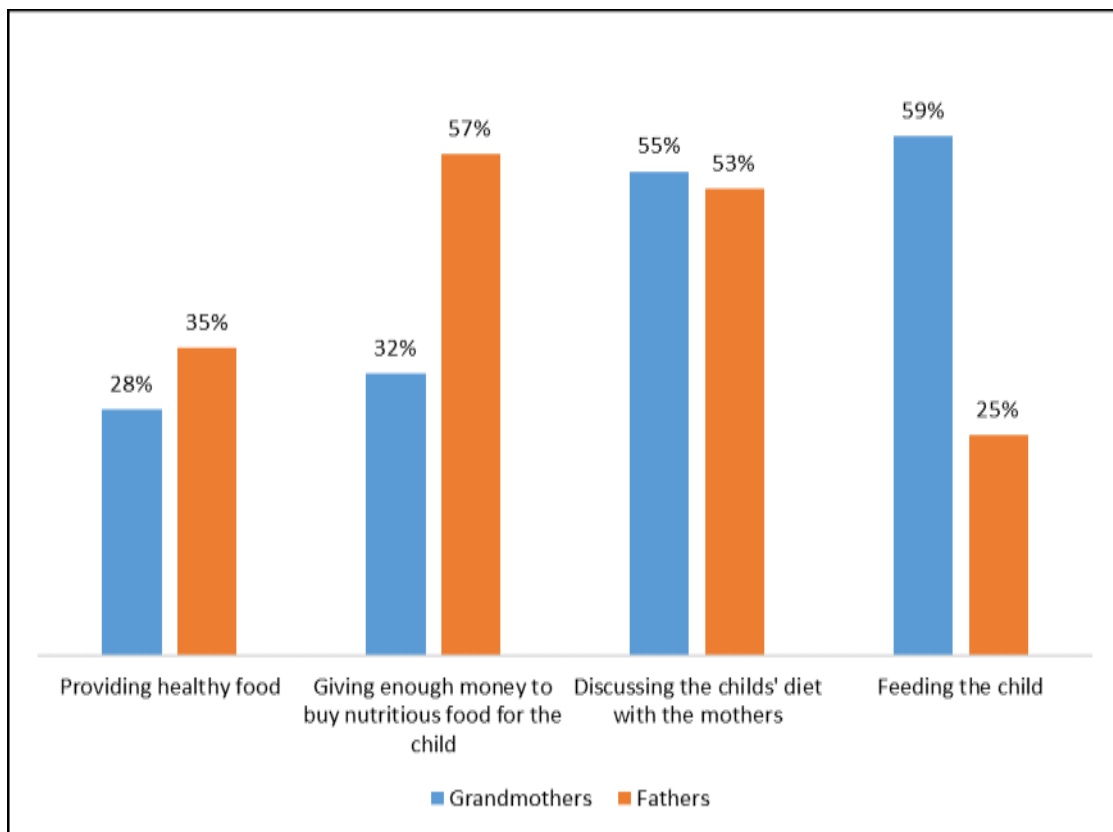


Figure 2 above presents Fathers' and Grandmothers' involvement in nutritional activities. The Figure shows that 25 per cent of the fathers were involved in feeding the children, 55 per cent discussed the child's diet with the mother and 57 per cent stated that they had given enough money to the child's mother to buy nutritious food for the child, only 35 per cent of them felt they had provided healthy food. This implies that the majority representing 65 per cent of fathers did not provide healthy food for their children (food that is nutritious and influences physical growth, cognitive development and disease prevention).

Conversely, 32 per cent of grandmothers received money from the parents of the children to buy nutritious food for their grandchildren. Fifty-five per cent of them had discussions with the mother of the children on the diet of the children, only 28 per cent said they provided healthy food while 59 per cent were involved in feeding the children. This indicates that most grandmothers representing 59 per cent were involved in feeding the children and discussed with the mother of the children the child's diet (55%).

The findings of the study clearly showed that most grandmothers were involved in nutritional activities compared to fathers.

Table 6: Indicating Fathers and Grandmothers' Involvement in Early Childhood Education Practices

Table 6 below shows early childhood education practices fathers and grandmothers were involved in in Kasama and Mungwi districts. Early childhood education practices are aimed at stimulating the cognitive development of children.

<i>Activity</i>	<i>Fathers</i>	<i>Grandmothers</i>
Taking the child to school	59%	44%
Being involved in homework given from school	51%	39%
Reading a book with a child	63%	31%
Teaching the child good habits e.g brushing the teeth	43%	29%
Teaching the child responsibilities e.g packing the uniforms In their rightful place after knocking off from school	48%	31%

Source: Field Data, 2021

In terms of early childhood education practices, Table 6 above indicates that 59 per cent of fathers and 44 per cent of grandmothers were involved in taking children to school, 51 per cent of fathers and 39 per cent of grandmothers helped children with homework given from school. Although homework is not frequently given at this level. Additionally, 63 per cent of fathers and 31 per cent of grandmothers were involved in reading a book with a child, 43 per cent of fathers and 29 per cent of grandmothers stated that they were involved in teaching the child good habits and values such as brushing teeth. Only 48 per cent of fathers and 31 per cent of grandmothers were involved in teaching the children responsibilities such as storing uniforms in their appropriate place after knocking off from school. Based on the findings above, it can be noted that fathers were more involved in early childhood education practices compared to grandmothers.

Table 7: Showing Fathers and Grandmothers' Involvement in Child Care Practices

Table 7 below shows fathers' and grandmothers' involvement in childcare practices in Kasama and Mungwi districts. Childcare practices focus on providing a safe, nurturing and supportive environment that promotes the overall well-being and development of children.

<i>Activity</i>	<i>Fathers</i>	<i>Grandmothers</i>
Bathing the child	67%	76%
Taking the child for immunisation	70%	79%
Putting the child to sleep	62%	63%
Taking the child to sleep	68%	70%
Taking the child to under five checkups	68%	67%

Source: Field data, 2021

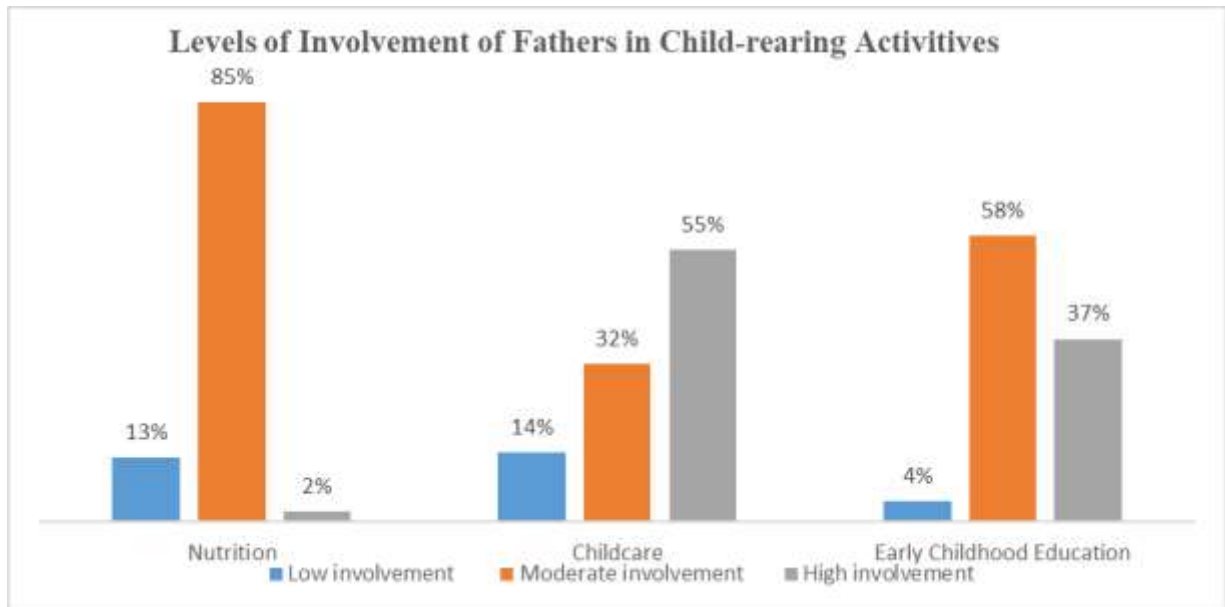
Table 7 shows the findings on childcare practices the fathers and grandmothers were involved in. In terms of bathing the child, 67 per cent of fathers and 76 per cent of grandmothers were involved, 68 per cent of fathers and 70 per cent of grandmothers were involved in taking the child to the hospital. Additionally, 70 per cent of fathers and 79 per cent of grandmothers were involved in taking their children for immunisation. In terms of taking the child for under five check-ups, 68 per cent of fathers and 67 per cent of grandmothers said they were involved. Lastly, 62 per cent of fathers and 63 per cent of grandmothers were involved in putting their children to sleep. From the findings above, it is clear that both fathers and grandmothers were equally involved in childcare practices.

4.4 Levels of Involvement of Fathers and Grandmothers in Child-Rearing Activities in Kasama and Mungwi districts

Child-rearing activities refer to the practices, behaviour and actions that parents or caregivers engage in order to support the cognitive, social, physical and emotional development of a child. These activities help shape a child's character and future behaviour. In this study, three child-rearing activities namely childcare, nutrition and early childhood education practices were assessed. To establish the level of fathers' and grandmothers' involvement in child-rearing activities, the researcher transformed the responses for both fathers' and grandmothers' sections into three scales namely, **0=Low** involvement, **1=Moderate** involvement and **2=High** involvement. Furthermore, the categories were made possible based

on the ratings of the range from the total scores they achieved in each activity, for example, **0-7=Low** involvement, **8-14=Moderate** involvement and **15-20 High** involvement.

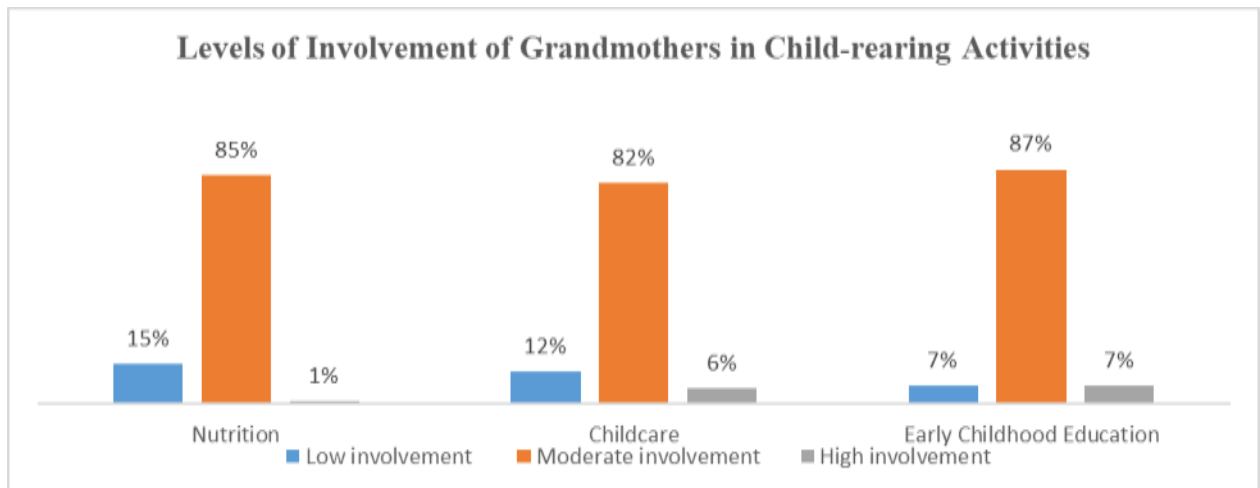
Figure 3: Levels of Involvement of Fathers in Child-Rearing Activities



Source: Field data, 2021

The results in Figure 3 depict the levels of involvement by fathers in child-rearing activities such as nutrition activities, child care practices and early childhood education practices in Kasama and Mungwi Districts. The figure shows that fathers (85%) were moderately involved (a balanced approach where an individual allocates a noteworthy amount of time, energy and resources to an activity) in nutrition activities. On childcare practices (bathing a child, taking the child to the hospital, putting the child to sleep, and taking the child for immunization) fathers had 32 per cent moderately involved with only 6 per cent of fathers being highly involved. Concerning early childhood education practices, the study established that 58% of fathers were moderately involved.

Figure 4: Levels of Involvement of Grandmothers in Child-rearing Activities



Source: Field data, 2021

Figure 4 depicts the levels of involvement by grandmothers in child-rearing activities such as nutrition activities, child care practices and early childhood education practices in Kasama and Mungwi Districts. The figure shows that grandmothers (85%) were moderately involved in nutrition activities. In childcare practices, grandmothers (82%) were moderately involved. Concerning early childhood education practices, the study established that 87% of grandmothers were moderately involved.

By comparison, the study indicates that grandmothers were moderately involved in activities such as nutrition, child care practices and early childhood education practices and fathers were moderately involved in early childhood education practices 54 per cent and child care practices 55 per cent in Kasama and Mungwi Districts respectively. In child care practices (Taking the child to bed, taking the child for immunization, bathing the child, putting the child to sleep and taking the child to the hospital) fathers were highly involved because they were able to read and follow instructions on health practices.

4.4.1 Results Showing Performance of Children on Cognitive Skills According to Age and Gender

To ascertain the performance of children in different cognitive skills, the researcher used a t-test to compare the means of two groups of children in terms of performance based on age and gender. The cognitive skills assessed include Vocabulary (Peabody) Focus and attention (Pencil tapping) Cognitive and expression language. The independent variables were Age and Gender and the dependent variables were expressive language, cognition, and executive function skills.

Table 8: Showing Performance of Children During Assessment

Variables	Mean	SD	t	df	p
Peabody Picture Vocabulary Test					
5 years	50.5696	6.17301	98.645	1177	.382
6 years	50.4848	7.51035			
Male	51.2128	6.15713	254.240	1177	.003
Female	50.0443	7.27945			
Pencil Tapping					
5 years	13.4250	4.69058	98.645	214	.001
6 years	14.0875	4.45995			
Male	13.9503	4.67911	107.443	193	.478
Female	13.7634	4.50897			
Cognition					
5 years	12.4214	1.80565	98.645	1177	.001
6 years	11.8215	1.45714			
Male	12.4379	1.89814	107.443	207	.001
Female	11.8519	1.37064			
Expressive Language					
5 years	9.2750	1.43284	98.645	1178	.001
6 years	9.0370	1.89010			
Male	9.3174	1.48383	98.645	1178	.001
Female	9.0153	0.12271			

The study did not find a significant difference between 6 and 5-year-olds on the Peabody Picture Vocabulary Test $P=.382$. This means that the age might not be a significant factor in acquiring receptive language among children based on the given data and context. The study however, found out a significant difference of $P=.003$ in acquiring receptive language skills based on gender. Male children performed better in receptive language than females with a mean of (51.21).

On Pencil Tapping the study showed a significant difference $P = .001$ and a mean of (14.08) based on age which means that there was a significant difference in acquiring skills such as focus and attention based on age. Children aged 6 years performed better than 5-year-old children in attention and focus. No significant difference was noted between males and females in terms of attention and focus.

General cognition was another domain the researcher assessed. Both age and gender showed a significance difference of .001 with a mean of (12.42). This means that children aged 5 years performed better than 6-year-old children in cognition activities.

Further, the study revealed that male children with a mean of (12.43) performed better than females.

In terms of Expressive Language (EL) a significant difference was noted on age and gender $P = .001$, children aged 5 years with a mean of (9.30) performed better than 6-year-olds and male children with a mean of (9.32) performed better than females.

Table 9 Showing Performance of Children in BRIEF Ratings

Variable	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>
Inhibition					
5 years	11.6161	7.27537	98.645	1177	.001
6 years	9.4865	6.92679			
Male	10.9675	7.95467	50.654	1177	.333
Female	10.5542	6.68718			
Shift					
5 years	5.7411	3.42240	98.645	256	.001
6 years	5.5000	4.00727			
Male	5.4130	4.22699	107.443	198	.005
Female	6.0443	3.48955			
Emotional Control					
5 years	4.8411	2.68796	51.366	236	.001
6 years	4.3013	3.32274			
Male	4.5526	3.14688	107.443	1177	.206
Female	4.7847	3.11174			
Working Memory					
5 years	10.5214	6.89893	98.645	1178	.001
6 years	8.9428	6.24298			
Male	10.1415	7.84470	50.418	1178	.289
Female	9.7221	5.71674			
Plan/Organisation					
5 years	6.4589	3.73713	98.645	1177	.001
6 years	4.8620	3.76069			
Male	5.7170	4.22955	107.443	1177	.645
Female	5.8229	5.71674			

From Table 9 shows that variations were noted in how the teachers rated the children on the BRIEF. It must be mentioned that the BRIEF instrument contains negative statements on the child's Executive Functions therefore the teachers had to rate by stating **Never=0** **Sometimes=1** and **Often=2**. Since the statements were negative, the higher the rating of the child the poorer the executive functions. In terms of inhibition 6-year-old-children ($P=.001$) performed better than five-year-olds therefore, six-year-olds exhibited better inhibition skills than five-year-olds. In terms of the children's ability to shift from one activity to the next, the study found a significant difference with $P= .005$ based on age 6-year-olds were rated better than 5-year-olds. In terms of gender, a significant difference ($P=.001$) was also noted in favour of male children whose abilities to shift from one activity to another were rated better than the females. In terms of emotional control, no significant difference was noted between males and females ($P=.206$) while a difference was noted based on age as 6-year-olds performed better than the 5-year-olds ($P=.001$). The children were also assessed on the ability to remember things, on this aspect, children's short-term memory was assessed, according to the results in Table 8, older children (6-year-olds) performed better ($P=.001$) than younger children (5-year-olds). No difference was noted based on gender in working memory. Lastly, children's ability to plan and organise was assessed, according to the results older children performed better than the younger children with a significance level of $.001$. Significant differences were noted in terms of gender male children performed slightly better than female children. From the results above it is evident that maturation played a big part in children's performance. Older children performed better in most of the activities than younger ones.

4.5. Effect of Fathers' Involvement in Early Childhood Education Practices on Cognitive Development of Children

To determine how fathers' and grandmothers' involvement in early childhood education practices affects the cognitive skills of children in Kasama and Mungwi districts, the researcher used linear regression. Linear regression allows us to measure how changes in the level of fathers' and grandmothers' involvement in early childhood education practices affect children's cognitive development. By estimating a linear relationship, we could determine the extent to which increased involvement is associated with better cognitive skills. Further, linear regression requires relatively few assumptions compared to other parametric methods making it more versatile.

Table: 10: Correlation Results for fathers' Involvement in Early Childhood Education Practices and their Effect on children's Cognitive Development

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.0968	.937	.936	1.75750

a. Predictors: (Constant) Fathers

b. Dependent Variable: Cognitive

A correlation (R) of .968 indicates a very strong positive relationship between a father's involvement and a child's cognitive skills. This suggests that as the father becomes more involved in the child's life, there is a highly consistent and positive influence on the child's cognitive abilities. Similarly, R-squared value of .937 indicates that 93.7 per cent of the variability of the cognitive skills of the child is explained by fathers' involvement in early childhood education practices suggesting a strong relationship between the variables and indicating a robust fit for the regression model on the data that was collected.

Table 11: Shows the Impact of Fathers' Involvement in Early Childhood Education Practices on the Cognitive Development of Children

Coefficients ^a					
Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
1 (Constant)	25.189	.677		38.139	.001
Fathers	1.744	.046	.968	38.060	.001

a. Dependent Variable: Cognitive Skills

Table 11 above illustrates the influence of fathers' involvement in early childhood education programmes. The regression line $Y = 25.819 + 1.744X$ represents a linear model describing the relationship between a father's involvement in early childhood education practices (X)

and a child's cognitive development (Y). In this context, the intercept term (25.819) represents the estimated cognitive skills when the father's involvement is zero. The slope term (1.744) indicates the change in the child's cognitive development for each unit increase in the father's involvement in early childhood education practices. In other words, as X (father's involvement in early childhood education practices) increases by one unit, Y (child's cognitive development) is expected to increase by 1.744 units. This linear regression equation provides a way to predict or estimate the child's cognitive development based on the level of the father's involvement in early childhood education practices. These findings are well illustrated by the scatter plot below in Figure 4.

Figure 4: Scatter Plot Showing the Impact of Fathers' Involvement in Early Childhood Education Practices on Cognitive Development of Children

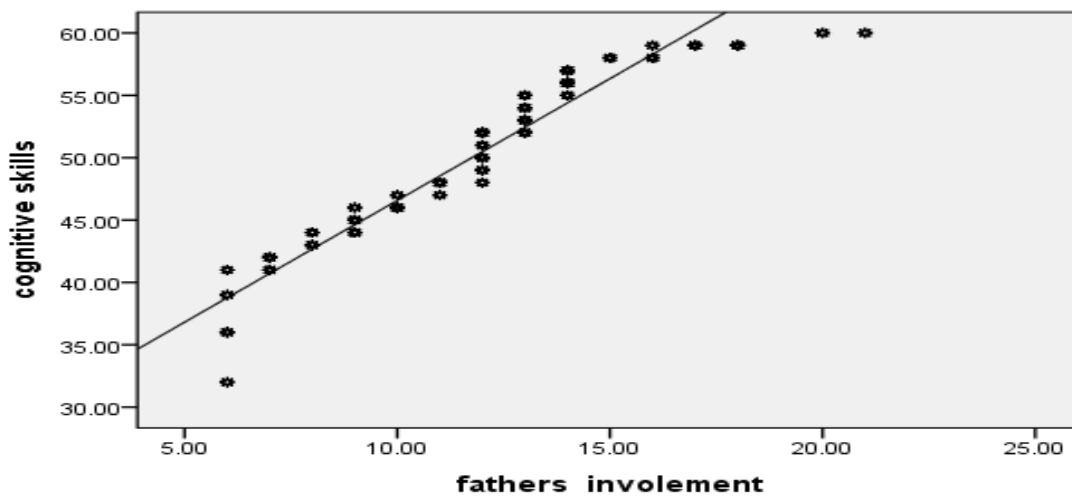


Figure 4 above shows a scatter plot where all data points are close to a positive regression line between cognitive skills and fathers' involvement in early childhood education practices suggesting a strong positive relationship. This indicates that as fathers increase their involvement in early childhood education practices, children's cognitive skills improve. Again, the proximity of the points to the line indicates a good fit for the regression model, with minimal error between the observed and predicted values. In this case, the slope of the regression line is positive, reflecting the direct correlation between the variables.

As a follow-up on the findings, the question “what changes have you seen in your child as a result of being involved in early childhood education practices?” was asked to fathers, For instance, **Father B** from a rural area in response to the question observed that:

“Since my involvement, I have noticed her being able to count numbers with fewer difficulties. She is also able to draw and colour shapes”.

Also **Father A** from a peri-urban area also in responding to the question asked to the fathers disclosed that:

“I have noticed her counting numbers from 1 to 10 without many difficulties. She can brush her teeth without help”.

In addition, **Father L** from an urban area noted stated that:

“Since my involvement, I have seen him being able to count numbers from 1 to 20 and draw some pictures, especially human beings such as father and mother. I have also noticed some changes such as brushing his teeth without help”.

In contributing to the same issue, **Father M** said that:

“Since my involvement in early childhood education practices, I have seen her improve in terms of memory retention. She has also improved academically. She also does things independently”.

From the findings above, it was evident that respondents believed that the involvement of fathers in early childhood education practices influenced child cognitive skills of their children. The children developed some executive functions such as memory retention, pre-numeracy (counting numbers), early literacy skills and reciting the alphabet. These cognitive skills developed by children through their fathers’ involvement in early childhood education practices would help them with primary education because the majority of them were at the age of entering primary school.

4.5.2 The Effect of Grandmothers' Involvement in Early Childhood Education

Practices on the Cognitive Skills of Their Grandchildren in Kasama and Mungwi districts

Table:12: Correlation Results for Grandmother's Involvement in Early Childhood Education Practices and their Effect on Children's Cognitive Development

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.937	.878	.877	2.433396

a. Predictors (Constant) Grandmothers

b. Dependent Variable: Cognitive

A correlation (R) of 0.937 between grandmother's involvement in early childhood education practices and child cognitive development skills suggests a remarkably strong positive relationship. It implies that when a grandmother actively participates in a child's early childhood education, there's a positive effect on cognitive development. This finding underscores the influential role grandmothers played in fostering a child's cognitive growth and highlights the potential benefits of their active engagement. Furthermore, a correlation coefficient of 0.937 in a regression analysis between grandmother involvement in early childhood education practices and a child's cognitive development indicates a highly positive and strong linear relationship. In practical terms, this means that as grandmother involvement in early childhood education practices increases, there is a substantial and consistent positive effect on the child's cognitive development. The correlation coefficient close to 1 suggests that changes in grandmother involvement in early childhood practices can be closely associated with predictable changes in the child's cognitive outcomes within the context of the regression model. A high R-squared value in regression indicates that a large proportion of variability in the dependent variable is explained by the independent variable(s) in the model. It ranges from 0 to 1, where 1 signifies a perfect fit. An R-squared value of 0.878 in this study indicates that approximately 87.8 per cent of the variability in the cognitive development of the child is explained by the grandmother's involvement in early childhood education practices in the model. This suggests a very strong relationship between the variables, indicating a good fit for the regression model. The R-square tells us how much the dependent variable is explained by the independent variable. The study shows that the

increase in grandmothers' involvement in early childhood education practices increases the cognitive development of a child.

Table 13: Showing Effect of Grandmothers' Involvement in Early Childhood Education Practices on the Cognitive Development of Children

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	
	B	Std. Error	Beta	t
1 (Constant) Sig.	27.045	.922		29.348 .001
Grandmother	1.953	.073	.937	26.615 .001

a. Dependent Variable: Cognitive Skills

Furthermore, Table 13 above shows how strong the correlation is between grandmothers' involvement in early childhood education practices. For example, the regression line, $Y = 27.045 + 1.953X$, (where Y represents the child's cognitive development and X, represents the grandmother's involvement in early childhood education practices) provides a predictive model for the child's cognitive development based on the grandmother's involvement in early childhood education practices. The intercept term (27.045) represents the expected child's cognitive development when the grandmother's involvement in early childhood education practices (X) is zero. The slope term (1.953) indicates the average change in the child's cognitive development for each unit increase in the grandmother's involvement in early childhood education practices. So, for every unit increase in grandmother's involvement in early childhood education practices, the child's cognitive development of a child is expected to increase by 1.953 units, assuming a linear relationship. The intercept provides the baseline cognitive development when there is no grandmother involvement. This regression equation helps quantify the relationship between these variables in a predictive manner in this study. From the above regression line, we can evidently see that as the grandmother involvement increases the cognitive development of a child increases as well, showing that there is a strong positive correlation between the two variables suggesting that there is a positive influence on the cognitive development of a child as grandmother's involvement increases. These findings are well illustrated by the scatter plot below.

Figure 5: Scatter Plot Showing the Impact of Grandmothers' Involvement in Early Childhood Education Practices on the Cognitive Development of Children

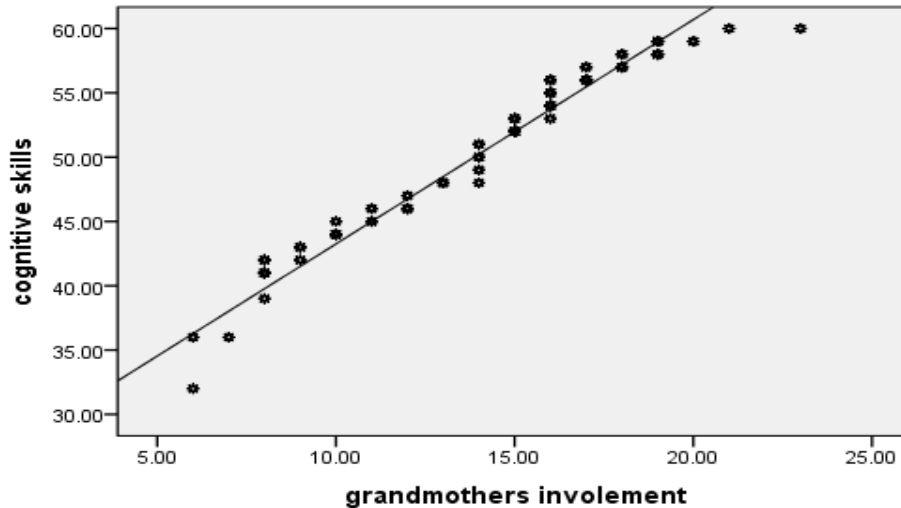


Figure 5 above shows a scatter plot where all data points are close to a positive regression line between cognitive skills and grandmothers' involvement in early childhood education practices which suggests a strong positive relationship. This means that as the level of grandmothers' involvement in early childhood education practices increases, the cognitive skills of children tend to improve. The closeness of the points to the positive regression line indicates a strong fit, suggesting that grandmother involvement is a significant factor in enhancing children's cognitive skills, with minimal variation between the observed and predicted outcomes.

As a follow-up on the findings of the effect of grandmothers' involvement in early childhood education practices on the cognitive development skills of their grandchildren, the following question was asked to grandmothers: "What changes have you seen in your grandchild as a result of being involved in early childhood education practices. In response to the question **Grandmother D** from the urban area disclosed that:

"Since my involvement in early childhood education practices, I have noticed her become very responsible. For example, every time she knocks off from school, she washes her uniform. She is even independent in doing certain activities".

Grandmother F from a rural area opined that:

“I have observed a lot of changes in him since my involvement, for example, he has improved in academic activities such as reciting the alphabet and being able to read vowels. He has also developed good habits and values such as brushing her teeth with less difficulty.”

In reacting to the same question on whether grandmothers evidenced seen some changes in their grandchildren after being involved in early childhood education practices, one grandmother from a rural area reacted by saying:

“I have seen some changes, especially in school work. She can count numbers from 1 to 20. Besides that, she has become more responsible. For example, she can do some small home chores without difficulties”.

Grandmother A from the peri-urban observed that:

“Since my involvement in early childhood education practices, I have seen my grandchild drawing pictures and shapes with less difficulty. She is also able to count numbers from 1 to 10 and construct some sentences in English correctly”.

From the views expressed by grandmothers above, it was clear that grandmothers' involvement in early childhood education practices influenced the cognitive development of their grandchildren who developed pre-academic skills such as early literacy and pre-mathematics skills.

4.5.3 Comparing the Involvement of Fathers and Grandmothers in Early Childhood Education Practices and their Influence on Cognitive Development of Children

The difference in slopes (1.953 and 1.744) between fathers' and grandmother`s involvement in early childhood education practices suggests that on average:

- (i) For each unit increase in the father's involvement in early childhood education practices, there is an expected increase of 1.744 units in the child's cognitive skills.

- (ii) For each unit increase in the grandmother's involvement in early childhood education practices, there is an expected increase of 1.953 units in the child's cognitive skills.

The difference in slopes indicates that, based on the collected data, the effect of the grandmother's involvement in early childhood education practices appears to be slightly larger effect on the child's cognitive development compared to the father's involvement in early childhood education practices. This is assuming other factors are held constant and that the relationship is accurately captured by a linear model. However, it's important to note that correlation does not establish causation, so while there's a strong association, other factors could also influence the child's cognitive development.

Figure 6: Scatter and Residual Plot for Fathers and Grandmothers Involvement in Early Childhood Education Practices

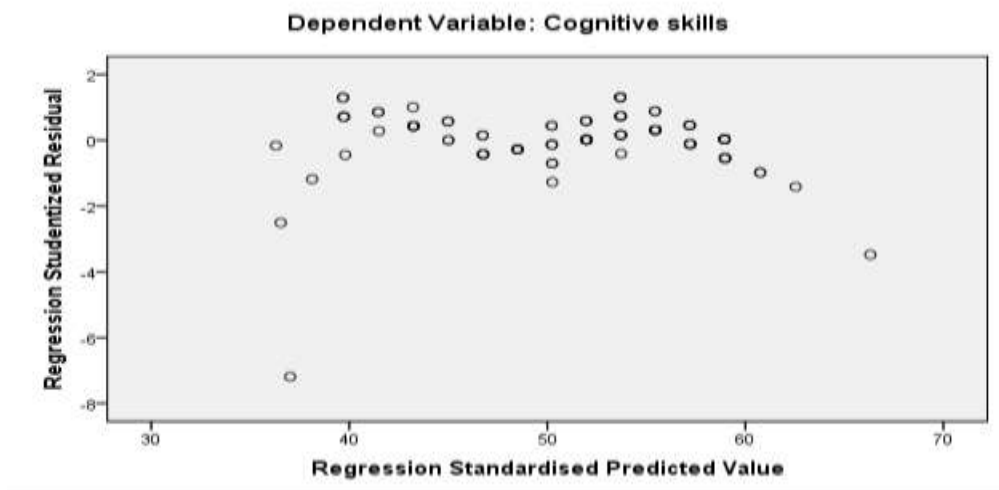


Figure 6 above shows how the model used in this study which is linear regression best fits the collected data. A good residual plot should exhibit a random scattering of points around the horizontal axis, indicating that the residuals are evenly distributed and show no discernible pattern. From the above residual plots, we can observe that the model is making unbiased predictions and there are no systematic errors left unaccounted for. It's a sign that the chosen model is a good fit for the data collected.

4.6 Specific Cognitive Stimulating Activities in Child-Rearing Activities which Influence the Cognitive Development of Children in Kasama and Mungwi Districts

To establish specific cognitive stimulating activities fathers and grandmothers were involved in that influenced the cognitive development of children in Kasama and Mungwi districts, linear regression analysis was utilized. BRIEF total represents executive functions which was the dependent variable while all child-stimulating activities are predictor variables.

Table 14: Specific Cognitive Stimulating Activities Fathers were involved in which Influenced the Cognitive Development of Children in Kasama and Mungwi districts

<i>Model</i>	Coefficients ^a				
	<i>Unstandardized Coefficients</i>		<i>Standardized Coefficients</i>		
	<i>B</i>	<i>Std Error</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>
1 (Constant)	6.574	2.504		2.625	.009
Telling them stories	4.634	.999	.183	4.637	.001
Singing songs to them	-.159	1.040	-.007	-.153	.878
Reading books to them	1.337	1.071	.049	1.248	.212
Providing toys and colourful					
Objects for them to develop senses	7.426	.864	.321	8.592	.001
Playing games with them	1.621	.937	.078	1.731	.084
Practicing alphabet	-1.180	.978	-.049	-1.207	.228
Practising counting	-2.502	1.030	-.094	-2.430	.015
Practicing shapes and colours	-3.815	.899	-.167	-4.243	.001
Visiting interesting places	.472	.998	.020	.472	.637
Talking with your child and					
naming commonly used objects	1.622	.871	.062	1.863	.063

a. Dependent Variable: Cognitive Skills

Table 14 above shows the findings on the specific Cognitive Stimulating Activities (CSA) fathers were involved in that predicted the children's cognitive development skills. The CSA showed their effect size based on t-values. The study revealed that cognitive stimulating activities such as providing toys and colourful objects for the children to develop their senses (visual, tactile, fine motor, gross motor skills, sensory integration and cognitive skills) t (8.592) ($P=.001$), telling stories t (4.637) ($P=.001$), practicing shapes and colours t (-4.243)

($P=.001$) were predictors for cognitive development skills of children in Kasama and Mungwi districts. Therefore, these cognitive stimulating activities fathers were involved in helped children develop pre-academic skills such as counting numbers, pre-literacy skills, reciting the alphabet, naming objects and shapes as well as the skills they might need in primary education.

Table 15: Specific Cognitive Stimulating Activities Grandmothers were involved in which Influenced the Cognitive Development of Children in Kasama and Mungwi districts

<i>Model</i>	<i>Coefficients^a</i>				
	<i>Unstandardised Coefficients</i>		<i>Standardised Coefficients</i>	<i>t</i>	<i>Sig.</i>
	<i>B</i>	<i>Std Error</i>	<i>Beta</i>		
1 (Constant)	20.070	3.299		6.085	.001
Telling them stories	-2.703	1.128	-.079	-2.397	.017
Singing songs to them	3.879	1.070	.144	3.624	.001
Reading books to them	-3.766	.653	-.221	-5.766	.001
Providing toys and colourful Objects for them to develop senses	6.453	.769	.287	8.394	.001
Playing games with them	7.155	.990	.391	7.227	.001
Practicing alphabet	-2.010	.904	-.107	-2.224	.026
Practicing counting	3.231	1.023	-.107	3.159	.002
Practicing shapes and colours	-3.584	.689	-.185	-5.202	.001
Visiting interesting places	.558	.982	.026	.568	.570
Talking with your child and naming commonly used objects	-6.292	.755	-.229	-8.330	.001

Table 15 above shows the specific Cognitive Stimulating Activities (CSA) grandmothers were involved in that predicted their grandchildren's cognitive development skills. The cognitive stimulating activities showed their effect size (impact in enhancing cognitive development of children) based on t-values. The study indicated that cognitive stimulating activities such as providing toys and colourful objects for children to develop sense $t (8.394)$ ($P=.001$), playing games with children $t (7.227)$ ($P=.001$), practicing counting $t (3.159)$ ($P=.001$), practicing shapes and colours $t (-5.202)$ ($P=.001$), reading books to children $t (-5.766)$ ($P=.001$), talking with the child and naming commonly used objects $t (-8.330)$ ($P=.001$) were predictors of cognitive development skills of their grandchildren in Kasama and Mungwi districts.

The study findings therefore, demonstrate that grandmothers were more involved in most specific cognitive stimulating activities that influenced the cognitive development skills of the children than the fathers.

Figure 7: Showing Effects Size of Cognitive Stimulating Activities Fathers and Grandmothers were involved in Enhancing Cognitive Development among Children in Kasama and Mungwi districts

Figure 7 below illustrates the effect size of cognitive stimulating activities performed by fathers (in blue) and grandmothers (in orange) that enhanced cognitive skills among children. The researcher used **Pearson r** to determine the effect size of cognitive stimulating activities. The activities are listed along the x-axis while the y-axis shows the effect size which ranges from 0 to 0.9. The effects size are categorised as follows:

- Very small effect: $0.01 \leq |r| < 0.1$
- Small effect: $0.1 \leq |r| < 0.3$
- Medium effect: $0.3 \leq |r| < 0.5$
- Large effect: $0.5 \leq |r| < 0.7$
- Very large effect: $0.7 \leq |r| < 0.9$
- Extremely large effect: $|r| \geq 0.9$

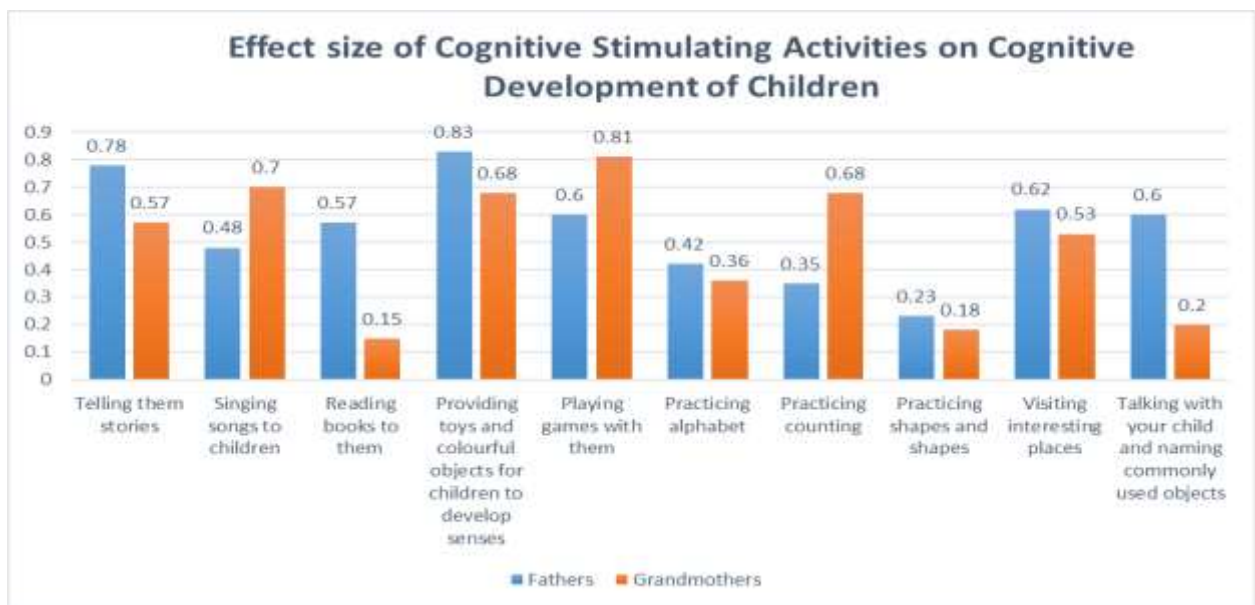


Figure 7 above shows that fathers generally had very larger effect size across most activities, particularly in providing toys and colourful objects for children to develop senses (0.83) and telling stories to children (0.78). Grandmothers had a very larger effect size (0.81) when playing games with children surpassing fathers significantly in this area. Fathers showed a large effect size in activities like reading books to children (0.57) and visiting interesting places with children (0.62) than grandmothers. Further, grandmothers showed a large effect size in activities like practicing counting (0.68) and singing songs to children (0.7) than fathers. The data above highlighted the differing strengths between fathers and grandmothers

in terms of stimulating children’s cognitive development across various cognitive stimulating activities.

4.7 Challenges Faced by Fathers and Grandmothers Involved in Child-Rearing Activities in Kasama and Mungwi Districts

The following were the findings on the challenges faced by both fathers and grandmothers in being involved in child-rearing activities:

Figure 8: Challenges Faced by Fathers in Being Involved in Child rearing activities

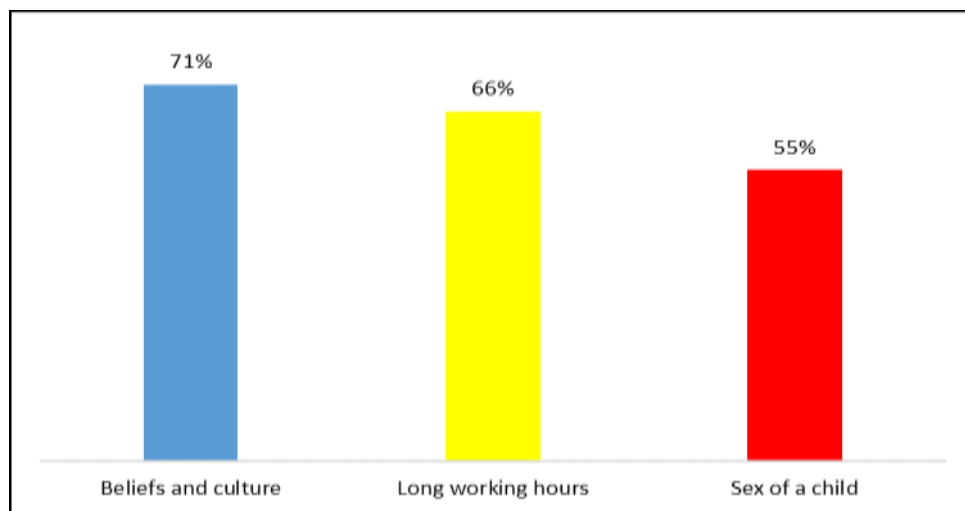


Figure 8 above indicates that most fathers representing 71 per cent faced cultural beliefs challenges on most child care activities such as bathing and dressing a girl child. They feared being laughed at by the people in their communities. Other fathers representing 66 per cent felt that long working hours were another impediment for them to participate fully in all child rearing activities. Due to long working hours, fathers did not have enough time to spend with their children. Lastly, 55 per cent of the fathers argued that the gender of a child limited them greatly because society’s cultural beliefs especially when handling a girl child in most childcare activities involving bathing and dressing a child.

Figure 9: Challenges Faced by Grandmothers in Being Involved in Child-Rearing Activities

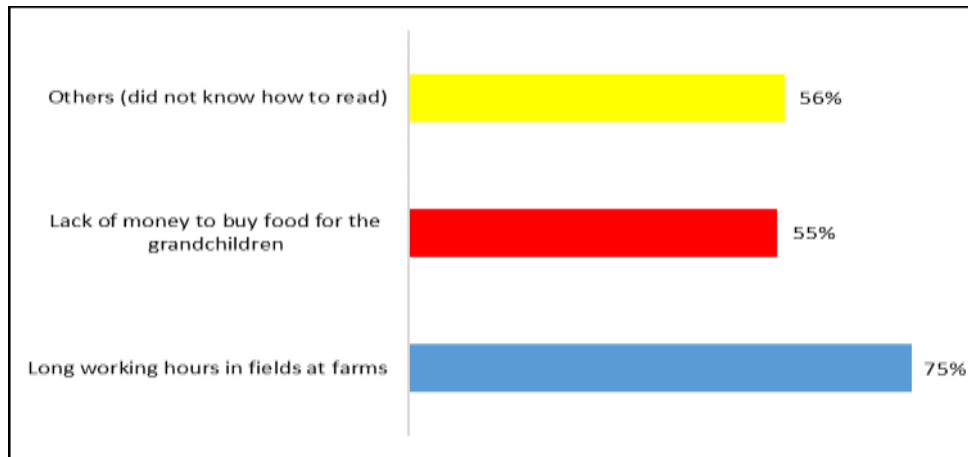


Figure 9 above shows that most grandmothers representing 75 percent faced challenges in being involved in child development programmes because they spent long hours working on farms, cultivating or harvesting. Fifty-five per cent of grandmothers did not have enough money to buy nutritious food for their grandchildren. Meanwhile, 56 per cent of them did not know how to read, hence, they found it challenging to participate in early childhood education activities such as reading a book to a child and being involved in homework given to their grandchildren. This is in line with the findings that 29 per cent of grandmothers were illiterate because of attending school.

4.8 Strategies That Could Improve Fathers and Grandmothers' Involvement in Child-Rearing Activities

Study findings indicated different fathers' and grandmothers' views on how to improve their involvement in child-rearing activities. The following were the views expressed by the fathers:

4.8.1 Fathers' Views on Improving Their Involvement in Child-Rearing Activities

Father A from a rural area opined that:

“In my view, for children to grow cognitively well, fathers need to find time to participate in child-rearing activities such as early childhood education activities regardless of their busy schedule. They should find time to teach children how to count and is also involved in homework activities for our children”.

Father C from a peri-urban area also explained that:

“I strongly feel that fathers should be encouraged to participate in child-rearing activities through men's groups, either in the communities or church groupings. This will help us share some challenges and strategies on how to improve our participation in child-rearing activities and overcome some beliefs which hinder us from fully participating”.

Father D from an urban area said that:

“Through sensitisation, both at church and radio programmes on paternal involvement in child-rearing activities will improve our perception towards participation in child-rearing activities. Those programmes will help us understand the importance of our involvement in these programmes and at the end of the day, this enhances our bonding between fathers and children”.

Father E from a rural area opined that:

“In my opinion, I feel the government should introduce some family-friendly policies such as flexible working hours and extension of paternity leave from 10 days to one month. These policies would allow fathers to fully participate in children's programmes”.

Father K from a peri-urban area supported the views of **Father E** by stressing that:

“I strongly feel the government should partner with cooperating partners who deal with children welfare in coming up with programmes that will allow fathers to fully participate in child-rearing activities, especially those in rural areas where fathers have negative perceptions towards participation in child development activities”.

Father J from a peri-urban area also asserted that:

“In my opinion improvement of fathers' involvement in child-rearing activities can be done through men's clubs or groupings in communities or churches. Through these clubs, men will encourage each other to fully participate in such activities. It is through these clubs or groupings that men will

be teaching each other the importance of being involved in child-rearing activities such as nutrition, childcare and early childhood education practices. I strongly feel this way will change men's attitudes toward certain child-rearing activities and strengthen the bonding between them and the children which is an important component in parenting”.

From the views above, it is clear that fathers proposed different strategies on how they could improve their participation in child-rearing activities. Some fathers revealed that the government needed to introduce family-friendly policies such as flexible working hours and extension of paternity leave to one month. These policies could allow fathers to have full participation in child-rearing activities. Other fathers felt that the government needed to carry out some sensitisation on the importance of fathers' involvement in child-rearing activities through local radio stations and national television. Furthermore, the government needed to partner with cooperating partners who deal with children's welfare so that they could come up with programmes that would allow fathers to participate fully in child-rearing activities. It was also revealed that fathers need to spare some time to be involved in child-rearing activities regardless of their busy schedules.

4.8.2 Grandmothers' Views on Improving Their Involvement in Child-Rearing Activities

The study also established some views by grandmothers on how their participation in child development programmes such as nutrition, childcare and early childhood education practices could be improved as indicated in their responses below.

Grandmother B from a rural area stated that:

“In my view, I feel that during holidays, grandchildren should be spending their holidays at their grandmother's place. This will improve the grandmother's participation in child development programmes such as nutrition and childcare”.

Grandmother C from an urban area also added that:

“In my opinion, I strongly feel that community and civic leaders such as Councillors, with cooperating partners such as World Vision, need to take a leading role in sensitising grandmothers

on the importance of them being involved in child-rearing activities. People in the community heed information which comes from community leaders”.

Grandmother J from a peri-urban area suggested the following:

“As grandmothers, we have a big role to play in child development. Therefore, through non-governmental organisations in our areas such as World Vision, grandmothers can form some women’s groups where they can sensitise each other on the importance of their involvement in child-rearing activities. This will encourage many grandmothers to fully participate in child-rearing activities such as nutrition, childcare and sometimes early childhood education practices”.

Grandmother E from an urban area observed that:

“In my view, women's clubs at church can sensitise grandmothers on their importance of being involved in child-rearing activities”.

Grandmother G from a rural area disclosed that:

“In my view, government and cooperating partners should come up with programmes that can be aired on local radio stations and national television encouraging grandmothers to participate fully in child-rearing activities such as childcare, early childhood education and nutrition practices”.

The sentiments depicted above, such as those purporting that grandchildren should spend their holidays at their grandmothers’, sensitise grandmothers through radio and television programmes on the importance of their involvement in child-rearing activities, community and civic leaders to play a big role in sensitising grandmothers and formation of women’s clubs at church summarised the grandmothers’ views on how to improve their involvement in child-rearing activities such as childcare, nutrition and early childhood education practices.

4.9 Chapter Summary

Chapter Four has highlighted the study’s results according to the study objectives in which it was established that fathers and grandmothers were involved in nutrition, childcare and early childhood education activities as child-rearing activities. With regards to nutritional activities, fathers and grandmothers were involved in discussions regarding the child’s diet issues with

the mother such as providing healthy food and child care practices such as bathing the child and taking the child to the hospital. The study unveiled that both fathers 84.8 per cent and grandmothers 84.7 per cent were moderately involved in nutrition activities. It is also clear that fathers' involvement in childcare practices was lower than that of grandmothers. Furthermore, regarding early childhood education practices, the study revealed that 87 per cent of grandmothers were moderately involved as compared to fathers who scored 58.3 per cent. Therefore, by comparison, the study indicated that grandmothers were moderately involved in activities such as nutrition and child care than fathers who were highly involved in early childhood education practices with a 37 per cent score and child care practices at 54.6 per cent.

Results from linear regression indicated a strong correlation between fathers' and grandmothers' involvement in early childhood education programmes and the cognitive development of children. The study also highlighted some specific cognitive stimulating activities that fathers and grandmothers were involved in that influenced the cognitive development skills of children. It further established the challenges fathers and grandmothers faced for being involved in child-rearing activities. Lastly, the study highlighted strategies that could improve fathers' and grandmothers' participation in child-rearing activities such as nutrition, child care and early childhood education practices. The next chapter will discuss the findings.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.1 Overview

Chapter Five discusses the findings of the current study entitled, '*Fathers and Grandmothers' Involvement in Child Rearing Activities and their Influence on the Cognitive Development Skills of Children in Kasama and Mungwi districts of Zambia*'. The discussion of findings was guided by five research questions formulated in line with the research objectives which aimed at ascertaining child-rearing activities that Zambian fathers and grandmothers were involved in; Levels of involvement of fathers and grandmothers in child-rearing activities; how fathers and grandmothers' involvement in early childhood education practices as child-rearing activities affected the cognitive development skills among children; child-rearing activities which influenced the cognitive development of children and challenges faced by fathers and grandmothers in being involved in child-rearing activities.

5.2 Child Rearing Activities that Zambian Fathers and Grandmothers are Involved in, in Kasama and Mungwi Districts

Fathers and grandmothers were the main targets for the provision of data on child-rearing activities they were involved in as guided by sub-headings prodding child-rearing activities fathers and grandmothers are involved in, in Kasama and Mungwi districts. In the study it was established that there are three child-rearing activities that fathers and grandmothers were involved in namely nutritional, early childhood education and childcare practices as can be gleaned below:

The study showed that fathers and grandmothers in Kasama and Mungwi districts were involved in childcare, nutrition and early childhood education practices. The study revealed that fathers were mostly involved in early childhood education practices as compared to the grandmothers 29% per cent who never went to school, hence, they had difficulties in being involved in early childhood education practices such as homework and reading books with the children.

From these results, it was clear that both fathers and grandmothers were highly involved in childcare practices. However, cultural beliefs made fathers not fully participate in certain childcare practices such as bathing children, especially girls. In many cultures including

Zambia, traditional gender roles dictate that childcare, including bathing children, is primarily the mother's responsibility. Men are often expected to be the breadwinners and focus on providing for the family. Some religious beliefs might also discourage the fathers in this study not to bath children. For instance, some interpretations of religious texts might emphasise the mother's primary role in nurturing and caring for young children, including bathing. Further, in some societies, men who take on tasks traditionally seen as women's work might face social stigma or ridicule. This discourages fathers from participating in activities like bathing children.

Arising from these findings, it is important to appreciate the fathers and grandmothers' involvement in child-rearing activities on theoretical approaches such as the 1979 Bronfenbrenner's ecological model and 1997 Developmental Niche of Super and Harkness which acknowledges the positive values family members can bring to the development of a child through involvement in any child-rearing activity. The developmental niche as a micro-system is in interaction with the wider macro-system of ecological and cultural adaptation. This interaction occurs through family members such as parents (fathers) and grandmothers' involvement in child-rearing activities. The developmental niche theory fitted well in this study because the developmental niche includes the child's immediate environment such as home, daycare and playground as context for experiences that shape cognitive, emotional and social development. Daily interactions with parents and grandmothers within these settings were crucial for developing social skills, language, and emotional regulation.

The physical environment and interactions within the developmental niche offered stimulation and learning opportunities crucial for the cognitive development of children. Also, rich language exposure, diverse play materials and engaging social interactions within the niche promoted the intellectual growth and emotional well-being of the children. This theory also fitted well in this study because it highlighted how important the involvement of immediate family members was in the development of the child.

By focusing on the micro-system the study found a holistic understanding of the immediate factors influencing a child's development. For instance, cognitive development was stimulated through parents' and grandmothers' involvement in learning and intellectually enriching experiences within the microsystem. Positive relationships with family members fostered healthy social development of the children. In the present study, findings on fathers'

involvement in early childhood education practices were consistent with Duursma (2014) who established that approximately 55 per cent of fathers reported that they read to their children weekly. Furthermore, Sacker *et al.* (2015) showed that fathers' involvement in reading as early childhood education practice with their children was socially patterned in what might be expected directions.

In this study, the findings on childcare were inconsistent with Jeong *et al.* (2018) who suggested that the most dominant paternal activities were earning and providing for the child and family. The study further pointed out that the fathers' level of education was perceived as an important predictor of fathers' caregiving roles or involvement in child rearing activities. This study's results appear to show that fathers' involvement in child care is still under construction in the two studied rural areas, where the study was conducted compared to grandmothers due to cultural beliefs in the communities. On the positive side, Zambian fathers are gradually becoming more consistent with the observations that men should spend more time at home with their children and be actively involved in child rearing activities.

The findings on nutritional activities revealed that grandmothers were mostly involved in these activities as compared to fathers. These results were consistent with those of Lasser, Fite, and Wadende (2011) who revealed that Kenyan fathers did not play much of a role in child rearing activities but remained as background forces that influence the child's life through the mothers by providing for the family as dictated by culturally ascribed duties. Their study further revealed that traditional Kenyan fathers were rarely directly involved in children's lives through interactions like play or their education.

Less involvement of fathers in nutritional activities could explain malnutrition statistics in the Northwestern province of Zambia. For example, a study by Moonga, Base-O'Relly, Berger, Harttgen, Michelo, Nowork, Siebert, Yabe and Seller (2021) highlighted that malnutrition among children in Zambia particularly in the Northern province remains a significant public health issue. The stunting among children under five years of age is high, with regional disparities being evident. For example, in the Northern province, approximately 50 per cent of children are stunted, which is considerably higher than in other provinces like Lusaka, Copperbelt and Western provinces where the prevalence is around 36 per cent. This finding is in agreement with the present study which revealed low involvement levels of fathers in nutrition-related activities. The low involvement of fathers in nutrition-related activities

might have caused stunting among children in Northern province. Further, Low involvement levels in nutrition-related activities might have a negative impact on children's cognitive development. It would be better for future studies to establish the relationship between fathers' involvement in nutrition-related activities and cognitive abilities of children as a longitudinal study.

Naome (2013) showed that family members including grandparents, uncles, aunts and siblings differed in their roles depending on their age, relationship and profession. Grandmothers taught manners and values to their grandchildren. In families where both parents work, grandmothers fed the children, told them stories, took them for walks and put them to bed.

Uchendu (2005) also added that extended family members (grandmothers, aunts and uncles) performed the function of educating and teaching members of their unit the accepted customs and traditions of the society. The researcher further posited that extended family members equally guide every member through a well-articulated practical system of traditional education to become good and obedient citizens of society. The extended family in which a child is born and in which he or she grows up helps in the shaping of the behaviour of the child. Therefore, the extended family environment as well as training deeply affects the child's character and leaves a lasting impression on the child's mind.

Falola's (2004) work equally showed that grandparents' involvement in childcare was becoming more common in Zambia today, given the HIV and AIDS context. Naome (2013), Uchendu (2005) and Falola's (2004) studies were in agreement with the present study findings in that grandmothers and fathers were involved in teaching children early childhood activities and teaching children good habits and responsibilities like packing uniforms in their rightful place after knocking off from school. All these activities shaped the character of children.

The findings on fathers' and grandmothers' involvement in childcare were contrary to Mooya (2016) who observed that sibling care was a widespread phenomenon in childcare in Zambia. Mooya's study revealed multiple childcare practices that were performed by older siblings in caring for younger children in homes including feeding, bathing and play. Females exhibited more care for their younger siblings, even if parents were present in the home. This

demonstrated the gender role socialisation of females as primary caregivers, a pattern that is widespread across Africa, including Zambia.

5.3 Levels of Fathers' and Grandmothers' Involvement in Child-rearing Activities in Kasama and Mungwi Districts

The study revealed that both fathers 85 per cent and grandmothers (85%) were moderately (not extremely) involved in nutrition activities. On child care practices, 82 per cent of grandmothers were highly involved in child care as compared to fathers who exhibited low involvement with 32 per cent. The study further revealed that fathers exuded low involvement levels in childcare practices than grandmothers. With regard to early childhood education practices, the study found that 87 per cent of grandmothers were moderately involved in early childhood education practices compared to fathers who scored 54 per cent. In comparison, the study indicated that grandmothers were moderately involved in activities such as nutrition, child care practices and early childhood education practices than fathers who were only highly involved in early childhood education practices with a 37 per cent score and a 55 per cent score on child care practices. The findings of the present study were in agreement with those of Duursuma (2014) who stated that 55 per cent of fathers read to their children weekly. Sacker *et al.* (2015) also disclosed that fathers with higher levels of education and income, in more advantaged occupations and those who were older than 30 years of age were likely to frequently read with their children. Koech (2010) and Njeru (2018) noted that the father's involvement was reportedly limited to unplanned support for childcare activities like providing monetary upkeep and that of a supervisor. Furthermore, fathers participated more in preschool activities that related to financial support and less in those that required them to sacrifice their time. It was noted that fathers were learned and capable of supporting their children's early reading development through reading and listening to them as a way of being involved in child-rearing activities. Hassain (2013) also observed that Bengali father's levels of involvement with their children were moderate. He reported that fathers were more involved in play than caregiving. Tudge (2008) equally observed that Brazilian middle-class fathers were highly active in child-rearing activities in Porto Alegre when compared to six other middle-class samples of his seven-culture study.

Regarding levels of grandmothers' involvement in child-rearing activities, the works of Sichimba (2015), Mooya and Mesman (2017) reported that there was a high prevalence of grandparental involvement in childcare in both Zambia and the Netherlands. Their study

revealed that Zambian grandparents performed more toilet training, protection from accidents and care during illness, while Dutch grandparents did more playing with their grandchildren as child care activities. Furthermore, the family size was a predictor of grandparents' high involvement in childcare activities in Zambia. Bigger families provided robust support in terms of child care of children. Both the previous and present studies established the levels of involvement in child-rearing activities by fathers and grandmothers, although the previous studies went further by establishing that family size was a predictor for grandparents' significant interaction with their grandchildren. The findings on family size provide some support for the conceptual premise that a big family helps in childcare activities. People within the big family provide shared responsibilities, foster family teamwork and offer practical skills in child care.

Based on the findings of the present study, it can be concluded that the result was not consistent with those of Auxiliadora, Dessen and Torres (2011) who noted that paternal involvement in child-rearing activities was due to an increase in divorce rate, a decrease in family size, later onset of parenthood, high levels of poverty, and increase in rates of women's employment and single parent families. United Nations (2011) added that Brazilian men's attitudes have recently shifted in favour of paternal involvement in child-rearing activities, and the majority of men were reported to have taken at least some time off work after the birth of their children. Ball and Wahedi (2010) underscored that socioeconomic status might be the main factor that influenced fathers' level of involvement in child-rearing activities among Bengali fathers in Bangladeshi because the majority were living in poverty and were relatively traditional in their attitudes toward gender roles like participating in child care compared to urban, educated and higher socioeconomic status fathers who were more egalitarian within the family. A further study with more focus on determining the level of involvement in child-rearing activities among fathers in urban, peri-urban and rural areas in Zambia would be therefore suggested. Huffman (2014) also observed that women's decision to work or stay home posed a great influence on the level of men's involvement in child-rearing activities and further, that maternal relationships also impacted the level of fathers' involvement in respective child development-related tasks. Women were perceived to be primary caregivers, whereas men performed a more auxiliary role.

Huerta *et al.* (2014) further added that fathers spent on average, a total of 42 minutes per day on child care, while mothers devoted an average of 1 hour and 40 minutes a day.

Additionally, across all countries of the Organisation for Economic Cooperation and Development (OCED), fathers spent less than half as much time on childcare as mothers did. The total amount of time devoted to children differed considerably across countries. For instance, the father's total time invested in child care was highest in Australia, Austria, Canada and the United States with more than one hour a day and the lowest was in Belgium, Estonia, France, Japan and South Africa with less than 30 minutes. This study produced results which corroborate the findings of a great deal of the previous work in this field but it established the difference in that fathers in the present study were moderately involved in most childcare activities (bathing the child, taking the child to the hospital, putting the child to sleep and taking the child for under five checkups), nutritional activities (providing healthy food, giving enough money to buy nutritious for the child, discussing the child's diet with the mothers and feeding the child), and early childhood education practices (taking the child to school, being involved with homework given from school, reading a book with a child, teaching the child good habits and values as well as responsibilities).

5.4.1 Performance of Children on Cognitive Skills Based on Age and Gender

Having discussed the levels of fathers' and grandmothers' involvement in child-rearing activities, the researcher presents children's performance in executive function skills such as working memory, plan/organisation, shift, inhibition and emotional control, receptive and expressive language and general cognition in relation to age and gender. Executive functioning skills refer to a set of cognitive processes that enable individuals to manage their thoughts, actions, and emotions effectively. These skills play an important role in various aspects of life including daily functioning, academic performance and social interactions means that age might not be a significant factor in acquiring receptive language. The study revealed that age was a factor in children's good performance in cognitive activities such as focus and attention, receptive language, expressive language, and cognition. The study further, showed mixed results with no consistent pattern indicating that one gender performed consistently better than the other in all executive function skills.

On the whole, the findings of this study are in line with those of Theodoraki, McGeown, Rhodes and McPherson (2020) who argued that age was found to be a significant predictor of pupils' performance in the inhibition activities. Controlling for non-executive processes implicated in performing the inhibition and working memory tasks had the most pronounced effect on the relationship between those tasks and age. Saunda and Namy (2013) add that

during preschool years, children begin to demonstrate improvements in executive function skills. They develop the ability to hold and manipulate information in working memory, exhibit better inhibitory control, and start to understand simple cognitive flexibility (shift). Further, the findings of this present study did conform to Carlson and Moses (2001) who found that older children (closer to 4.5 years) demonstrated better inhibitory control compared to younger children (around 3 years old). Their study suggested that as children grow and their prefrontal cortex develops, they tend to improve their inhibition skills. Mahy and Moses (2011) also suggested that there was a trend toward 4-year-olds performing worse in the long delay compared to the short delay condition, whereas 5-year-olds showed the opposite pattern, performing marginally better in the long delay than the short delay condition. Six-year-olds performed equally well and close to the ceiling in both delay conditions. They performed significantly better than 4-year-olds (but not 5-year-olds) in both the short and long-delay conditions.

From this discussion, the present study concluded that age had a significant effect on the performance of children in executive function skills, as children grow their executive functioning skills. Although there is no specific age that universally performs better in executive functions, various factors such as genetics, environment and experience may influence their performance greatly.

The study further showed the performance of children in executive function skills in relation to gender. The study on gender differences in executive functioning skills among children has shown mixed results, with no consistent pattern indicating that one gender performed consistently better than the other in all executive functions. For example, in inhibition activities, gender did not have an effect on children's performance with a significance level of .0333. The significance level for shift based on gender for children was .005 with female children performing better than the male children. The significance level of .206 for emotional control based on gender suggested that there was no significant difference in the emotional control abilities of different gender groups in the performance during the assessment.

Lastly, the significance level of .289 for working memory and .645 for plan and organisation showed that gender had no effect on the performance of children in these executive functioning skills. From the results above the study suggested that gender differences in

executive functioning skills among children are difficult and task-specific. Female children may perform well in certain aspects, while male children perform better in others. It could be concluded that these differences might be influenced by a complex interplay of biological, environmental, and cultural factors.

The present study findings are not in agreement with the findings by Li and Geary (2013) who suggested that girls might perform slightly better in inhibitory control tasks, which involve impulsive responses than boys. Another explanation for the superior performance of girls in inhibitory tasks relates to biological differences in brain development and structure. Lenroot and Giedd (2011) suggest that the prefrontal cortex, the brain region responsible for executive functions such as inhibitory control, matures earlier in girls than boys. This earlier maturation might contribute to better performance in tasks requiring inhibition in this study.

Similarly, Else-Quest, Hyde, Goldsmith and Van Hulle (2006) stress that temperamental differences between boys and girls may also contribute to disparity in performance in inhibitory activities. Girls are found to be more adept at managing their emotions and impulses which align with the requirements of inhibitory control activities. Boys on the other hand, may exhibit higher levels of impulsivity and activity which could make these activities more challenging for them. Stoet (2017) adds that boys may perform slightly better in tasks involving cognitive flexibility (shift), which involves switching between different tasks or rules.

The study further suggested that executive function skills emerge during the first years of life, and continue to strengthen significantly throughout childhood and adolescence. The study by Bset and Miller (2010) on gender differences in executive functioning suggested that the performance of children may be influenced by cultural and societal expectations. For example, girls may be socialised to be more organised and attentive, which could influence their performance in certain executive tasks. Else-Quest *et al.* (2006) add that girls are often socialised to be more compliant, attentive, and self-regulated, which enhances their inhibitory control skills. From a young age, girls in most societies including Zambia may receive more encouragement to follow rules, wait their turn, and behave in a socially appropriate manner, all of which are linked to better inhibitory control.

A similar study by Hyde (2005) noted that there was substantial variation within each gender, and emphasised that gender should not be considered a strict determinant of executive

functioning skills. Tamnes, Bos, Van de Kamp, Peters and Cronen (2015) add that gender-related differences in executive functioning may vary with age. The difference in executive functions between boys and girls tends to diminish as children grow older. The combined effects of brain maturation, hormonal shifts, environmental factors, and cognitive practice contribute to the diminishing difference in executive functions between boys and girls as they grow older (Lenroot & Geidd, 2011; Best & Miller, 2010; Diamond, 2013).

5.5 Fathers and Grandmothers' Involvement in Early Childhood Education Practices and their Effect on Cognitive Development of Children

Fathers and grandmothers as extended family members are important in child development as they promote cognitive development through their involvement in child-rearing activities such as early childhood education practices. As such, to determine how fathers' involvement in early childhood education practices affects children's cognitive development skills, linear regression was performed to show the correlation between fathers' and grandmothers' involvement in early childhood education practices and the cognitive development of children. A correlation of .968 for fathers indicated a very strong positive relationship between a father's involvement in early childhood education programmes and a child's cognitive development. This suggests that as the father becomes more involved in the child's life, there is a highly consistent and positive effect on the child's cognitive abilities. Further, the study showed a correlation of .937 between grandmother's involvement in early childhood education practices and child cognitive development suggesting a remarkably strong positive relationship. It implies that when a grandmother actively participates in a child's early childhood education, there's a positive effect on cognitive development. In support of the above findings, fathers and grandmothers were asked a follow-up question to describe the changes they had noted in children as a result of being involved in early childhood education practices. One of the fathers observed that: *"Since my involvement, I have seen him able to count numbers from 1 to 20 and draw some pictures, especially human beings such as father and mother. I have also noticed some changes such as those of brushing her teeth without help"*. One of the grandmothers additionally opined that: *"I have observed a lot of changes in him since my involvement, for example, he has improved in academic activities such as reciting the alphabet and being able to read vowels. He has developed good habits and values such as brushing his teeth with less difficulties"*. It was clear that fathers

and grandmothers' involvement in early childhood education practices had made children develop cognitive skills.

On the whole, the findings are in line with that of Mwanza-Kabaghe (2015;2022) who showed that ECE children whose significant others were more involved in reading with them at home had greater gains in reading. Meuwissen and Carson (2015) also added that children with involved fathers had higher intelligence quotients on average, increased executive function, and improved school conduct and self-concept. Cabrera *et al.*'s (2006) study was also aligned with the present study by suggesting that specific significant others such as fathers' and grandmothers' behaviour such as home-learning stimulation were directly related to children's reading, mathematics and social development in preschool and kindergarten. This finding is supported by the views of one of the grandmothers from the urban area who said: *"Since my involvement in early childhood education practices, I have observed a lot of changes in him, for example, he has improved in academic activities such as reciting the alphabet and can recite vowels. He has developed good habits and values such as brushing his teeth with less difficulties"*.

Furthermore, Daly (2007) observed that fathers' involvement in child-rearing activities is associated with many positive outcomes such as high intelligence quotients, advanced linguistic and cognitive capacities and improved verbal skills. Grossmann *et al.* (2002) agree with the previous observations by stating that significant others who undertake verbal interactions structured activities, and games with their children allow them to live rich linguistic communication. These findings were similar to the present findings, involvement of fathers in early childhood education practices enabled children to develop receptive language. These experiences encourage children's active exploration and engagement with their environments and improve children's academic skill and their success in school. These findings were also echoed by one of the fathers in the present study who when asked to describe what changes he has noticed in his child after being involved in early childhood education practices opined: *"Since my involvement in early childhood education practices, I have seen her improve in terms of memory retention. She has also improved academically and does things independently"*.

The present study has therefore demonstrated that child cognitive development is enhanced when fathers and grandmothers as extended family members are involved in the lives of

children and grandchildren's early development. The findings confirmed our hypothesis that fathers' involvement in early childhood education practices affects the cognitive development of children positively.

Present study findings on how fathers and grandmothers' involvement in early childhood education practices influenced the cognitive development of children were consistent with the theoretical model used in this study by Bronfenbrenner and Morris's (1998) work on the Application of Ecological Theory on the Learning and Development of Children. Bronfenbrenner and Morris (1998) saw the relevance of fathers and grandmothers as extended family members as immediate significant others to be important in the cognitive development of children.

Participation of fathers and grandmothers in early childhood education practices such as being involved in giving homework and reading a book with a child is supported by the Ecological System Theory which considers these family members and their relationship with children as an interface of systems, necessary in child cognitive development. It is believed that the structure of the family like the ones referred to in this study which had extended family members (grandmothers) helps children to develop cognitively because of the interaction the child has with the family members. One of the noticeable cognitive skills among children is receptive language which is fast developed through interaction among family members. Children in the present study who were assisted by fathers and grandmothers performed exceedingly well in cognitive skills and executive functions, therefore, it is important to provide opportunities for interactions within the settings of the theory the study has discussed in order to foster cognitive development among children.

On the other hand, the findings of this study did not conform to Deluccie (1996) who argued that father involvement is beneficial to fathers themselves. He proposed that fathers who are involved feel more self-confident and effective as parents. They find parenthood more satisfying, feel more intrinsically important to their children, and feel encouraged to be even more involved. Ancell, Bruns and Chitiyo (2016) corroborate the previous views when they posit that fathers who are involved in their children's lives are likely to exhibit higher levels of psychosocial maturity, be less psychologically distressed, and are more likely to participate in the community and assume leadership roles in civic community organisations.

Furthermore, the works of Culp, Schadle, Robinson and Culp (2000), Ross and Broh (2000) and Deutsch, Servis and Payne (2001) observed that high father involvement was associated with increased children's feelings of paternal acceptance, a factor that plays a role in the development of self-concept and esteem. These results were not explored in this study but, the study strongly established that with the father and grandmother's involvement in early childhood education practices, children demonstrated a greater internal locus of control and had a greater ability to take initiative and use self-direction and control such as putting the uniform in a right place after knocking off from school. In addition, children could wash their uniforms after being knocked off from school, an indication of the father's and grandmother's involvement in early childhood education practices.

Baxter and Smart (2011) further noted that positive father involvement in child-rearing activities was associated with some benefits, including better outcomes for fathers and the family as a whole. For, example, fathers who spent more time with their children had on average more favourable labour market outcomes such as earning more per hour and working fewer hours per week than their peers who spent less time with their children. The above findings demonstrated the difference between the previous studies and the present study in that the current study focused on the influence the fathers and grandmothers have on the cognitive development of children after being involved in early childhood education activities.

5.6 Specific Cognitive Stimulating Activities in Child-Rearing Activities which Influence the Cognitive Development of Children in Kasama and Mungwi Districts

Having discussed study findings from Kasama and Mungwi districts on how fathers' and grandmothers' involvement in early childhood education programmes affect cognitive development skills among children, specific cognitive stimulating activities that fathers and grandmothers were involved in that influenced the overall cognitive development skills of children are discussed in this section.

Table 14 shows findings on specific cognitive stimulating activities fathers were involved in that influenced the cognitive development skills of children. The study revealed that stimulating activities such as telling stories, providing toys and colourful objects for children to develop their senses, and practising shapes and colours were predictors of cognitive development skills in children.

Table 15 shows the specific cognitive stimulating activities grandmothers were involved in that influenced the cognitive development skills of their grandchildren. The findings indicate that stimulating activities such as singing to the children, reading books to the children, providing toys and colourful objects for them to develop senses (visual, tactile, fine motor, gross motor skills, sensory integration and cognitive skills), playing games with them, practising counting, practising shapes and colours, talking with them and naming commonly used objects were predictors of cognitive skills of their grandchildren. Arising from these findings, it is clear that grandmothers were more involved in specific cognitive stimulating activities that influenced the cognitive development skills of the children in Kasama and Mungwi districts. Further, the study revealed the effect size of cognitive stimulating activities fathers and grandmothers were involved in. Fathers had very larger effect size across most activities such as providing toys and colourful objects for children to develop senses (0.83) and telling stories to children (0.78). Grandmothers had a very larger effect size (0.81) when playing games with children surpassing fathers significantly in this area. Fathers showed a larger effect size in activities like reading books to children (0.57) and visiting interesting places with children (0.62) than grandmothers. Further, grandmothers showed a larger effect size in activities like practising counting (0.68) and singing songs to children (0.7) than fathers.

The findings of the present study were consistent with those of ZANEC (2015) which noted that parents were involved in routine cognitive stimulating activities with children. Routine cognitive stimulating activities included playing with them, breastfeeding, spending time with them, taking them to bed, teaching them, taking them to school and ensuring their well-being, although the present study established that some fathers and grandmothers lacked a clear understanding of what stimulating activities entailed. The findings are further in line with Zucker *et al.* (2013) who argued that parenting practices and formal and informal activities such as reading a book, singing and telling stories provide children with pre-academic cognitive stimulation and expose them to language-rich experiences, including vocabulary and syntax which are predictors of children's pre-academic skills.

Based on the findings of this study, it can be concluded that the results were not consistent with those of Salmon (2010) who looked at ways in which music can promote thinking and increase literacy skills. He argued that music and soundscape engage children in creative and imaginary journeys in their minds. Secondly, that music helps children grow in so many

areas. Walton (2014) adds that, if caregivers learn how to use music at home or in the classroom, it will help children develop cognitive skills. Similarly, Geist and Geist (2008) established that math and music have a link to the brain when exposed to children early in life. Their study suggested that music contains numerous mathematical constructs within its basic structure and that music elements such as steady beat, rhythm, tempo, volume, melody and harmony possess inherent mathematical concepts such as sequencing, counting, and patterning. It is clear that music has the power to entertain but also to teach. The present study did not align itself with the study of Cooper (2010) who found that using music and songs in the classroom builds vocabulary and self-expression, which are two goals of literacy and can work together to promote growth in both areas. Reading and singing both have very specific structures and sounds that can provide pupils with the opportunity to enhance memory, attention spans and language skills (Cooper, 2010).

5.7 Challenges Faced by Fathers and Grandmothers in Being Involved in Child-Rearing Activities in Kasama and Mungwi Districts

Having discussed specific cognitive stimulating activities that fathers and grandmothers were involved in that influenced the overall cognitive development of children in Kasama and Mungwi districts, this section discusses challenges that fathers and grandmothers faced in being involved in child-rearing activities in Kasama and Mungwi districts. Two hundred (200) fathers and grandmothers provided this information.

The study showed that most fathers were challenged by cultural beliefs on most childcare activities such as bathing and dressing a girl child. Others felt that long working hours were another impediment for them to participate fully in all child-rearing activities. On the other hand, grandmothers faced challenges such as long hours spent working on farms cultivating or harvesting, some did not have enough money to buy nutritious food for their grandchildren. Another challenge faced by grandmothers was that some did not know how to read, hence, they found it difficult to participate in early childhood education activities such as reading a book for the child and being involved in homework given to their grandchildren. This result is in line with the finding in the present study that 29% of grandmothers did not attend any school.

Wangari (2006) asserted that many traditional practices continued to influence fathers' involvement in child-rearing activities in today's Kenya. Fathers are excluded from early

childcare practices in the Kikuyu ethnic community; hence father-child interaction is low. Pleck (1997) also added that the quality of the father-child relationship appears to be much more significant than the quantity of father-child contact.

Other studies on challenges faced by fathers and grandmothers in their involvement in child-rearing activities, such that of Norman *et al.* (2014) and Reynolds *et al.* (2003) explain work factors such as workplace conditions and organisational culture as being challenges that limited fathers' involvement in child-rearing activities. Long hours had a strong negative impact towards child care and accessibility for fathers. Added to that, the study revealed that fathers spent on average, a total of 42 minutes per day on child care, while mothers devoted an average of 1 hour and 40 minutes a day. Across all countries of the Organisation for Economic Cooperation and Development, fathers spent less than half as much time on childcare as mothers did. Huffman *et al.* (2014) added that men with more traditional views of the provisional father role tended to work longer hours and experienced greater amounts of work-family conflict.

Although the present study did not establish how many hours fathers and grandmothers spent in childcare activities, fathers who participated in the study revealed that their wives were more often involved in child development programmes than themselves, an indication that they spent less time with their children. The present study also established that fathers and grandmothers spent on average 8 to 10 hours working in formal and informal employment. For example, grandmothers spent 8 hours in the fields during harvest time. Furthermore, the present study established different challenges from the previous studies. For example, 55 per cent of grandmothers did not have enough money to buy nutritious food for their grandchildren whereas 56 per cent did not know how to read, therefore, they found it challenging to be involved in early childhood education activities such as reading a book with a grandchild and being involved in homework given to their grandchildren. This result is in line with the finding that 29 per cent of grandmothers did not attend any school.

The study findings on the gender of the child as a challenge faced by fathers in a quest to be fully involved in child-rearing activities agreed with Baxter and Smart (2011) and Lamb (2010) who noted that the gender of the child affected how fathers interacted with their children. Baxter (2012) added that fathers were somewhat more involved in the childcare activities of sons than daughters. Examples are, helping children with their toilet and bathing.

Dermott (2005) established that child characteristics such as gender and parents' characteristics like beliefs, attitudes and preferences, posed a challenge concerning fathers' involvement in child-rearing activities. These findings were conclusively in line with the present study which also unveiled that fathers were more involved with boys than girls due to cultural beliefs over the girl child, thereby resulting in fathers being differently engaged in childcare activities such as bathing the children.

Based on the findings of the current study, it can be concluded that the results were not consistent with those of Baxter and Smart (2011) who observed that the age of the child was an important determinant that hindered fathers and other caregivers such as grandmothers to devote to childcare activities. For example, fathers' childcare time seemed to reach a peak level at pre-school age and declined with the increasing age of the child.

Furthermore, Temperament was another characteristic of the child that influenced fathers' involvement in child development programmes (Baxter & Smart, 2011). In addition, the study revealed that the number of children in the household affected the frequency fathers and extended family members such as grandmothers spent on child development programme-related tasks. For instance, fathers and grandmothers in large families dedicated less time to children. It was discovered that extra time was spent on other domestic work in those families.

Jeong *et al.* (2018) equally added that poverty undermined the role and identity of fathers as providers with unstable jobs and sources of income, thereby causing difficulties for fathers to purchase food, clothes, and toys, pay for the child's school fees, and seek health care and treatment. All these hindered fathers' full involvement in child-rearing activities. Furthermore, fathers who were not married to their child's mother, as well as divorced non-custodial fathers, were often prevented from being involved in child-rearing activities as they would like to be based on a pervasive post-divorce preference for awarding primary custody to mothers, and by policies that make paternal access to children dependent upon financial provision (Raub *et al.*, 2013). In the present study 57 per cent of fathers gave money to their wives to buy nutritious food for their children, an indication of providing financial assistance to the family regardless of the challenges faced in being involved in child-rearing activities.

Howitz (2001) and Posel's (2003) studies showed that one of the challenges families face in involving fathers or any extended family members in child-rearing activities was the

structural separation of men from children and families as a result of a combination of colonisation and urbanisation, which radically transformed family arrangements and roles over the last century. Colonial powers in Southern Africa, including Zambia, forced people into paid work by levying taxes that required local people to earn money. A pattern of male and much later, female migration from rural to urban areas was established, with families separated for long periods. This trend is still common in modern Zambia where able-bodied fathers have migrated to urban areas to look for employment so that they can supplement finances for the families they have left back home. This has made most fathers not participate fully in child development-related tasks. The present study revealed that 52 per cent of fathers were in formal employment where they spent more hours working hence affecting their full participation in child-rearing activities.

5.8 Strategies that could Improve Fathers' and Grandmothers' Involvement in Child-rearing Activities

This section discusses strategies that could improve fathers' and grandmothers' involvement in child-rearing activities such as child care, nutrition practices and early childhood education practices. The findings of the present study indicated different views from fathers and grandmothers on how to improve their involvement in child-rearing activities.

It was clear that fathers used different strategies to improve their participation in child-rearing activities. Some fathers revealed that the government needs to introduce family-friendly policies that could encourage them to have full participation in child-rearing activities such as flexible working hours and an extension of paternity leave from the current 10 days to probably one month. Other fathers felt that the government needed to carry out some sensitisation on the importance of fathers' involvement in child-rearing activities through local radio stations and national television. They further suggested that the government should partner with cooperating partners who deal with children's welfare so that they could come up with programmes that would allow fathers to fully participate in child-rearing activities. It was also revealed that fathers need spare time to be involved in child-rearing activities, regardless of their busy schedule, as this would create a strong bond between fathers and the children and foster positive development among children.

Grandmothers also suggested that for them to be fully involved in the child-rearing activities of their grandchildren, the government needed to sensitise them through radio and television

programmes on the importance of their involvement in child-rearing activities. They further observed that civic leaders such as Councillors and Community leaders like Chiefs needed to play a big part in sensitising grandmothers on the importance of being involved in child-rearing activities. The formation of women's clubs in communities and at churches that would teach grandmothers the importance of their involvement in child-rearing activities and other child-related welfare was suggested as a strategy that would improve their participation in child-rearing activities. Lastly, grandmothers observed that their grandchildren need to spend their holidays at their grandmothers' places, that this would help create a strong bond between them and their grandchildren, thereby enhancing healthy development among children and increasing grandchildren's feelings of grandmother acceptance, a factor that plays an important role in the development of self-esteem among children.

These findings are in agreement with those of Heurta *et al.* (2014), and Engle and Breaux (1998) who observed that companies need to introduce family-friendly policies and practices such as flexible working hours and paid paternity leave that could increase men's participation in child-rearing activities and that the child care leave could be either paid or unpaid, and this strategy could make fathers have more contact with their children. Kaufmann (2005) also suggested father's group sessions as one way of encouraging men's participation in child-rearing activities. Fathers' groups were preferably led by ordinary fathers who have been sufficiently trained for the purpose, and continuously guided and supported participants in the fathers' groups often become role models and often help enroll more fathers. Fathers' groups have been implemented in various countries, for example, Russia, Vietnam, Sweden and Ethiopia, and have brought positive changes for men. Furthermore, fathers who participated in the fathers' groups showed greater commitment towards their children.

Findings on introducing new programmes by the government and engaging cooperating partners that would encourage fathers and grandmothers' involvement in child-rearing activities are in line with Peacock and Botha's (2006) and Richter and Morrell's (2006) studies that showed that, civil society organisations in South Africa were working to promote constructive male involvement, and responsible fathers were active and increasingly successful at enlisting men and creating awareness. One of the programmes introduced to increase fathers' involvement in child-rearing activities was called *Fathers Speak Out and Men as Partners*. Furthermore, a fatherhood project aimed at influencing social expectations and perceptions about men and their care for children was introduced in 2003. The

programme created a sense of shared responsibility for children's development among men and women. It also showed men's long-term commitment to their involvement in children's lives.

Based on the findings of the present study, Zambian fathers might require programmes such as these projects introduced in South Africa to influence their social expectations and perceptions toward their involvement in child-rearing activities because these hinder them from effective participation in childcare activities due to cultural beliefs practised in their communities, especially the rural areas where the study was conducted.

The findings of the current study were not in agreement with that of Watson (1992) who observed that in the US, fatherhood education and development was formed and piloted in six US cities. It had a component of fatherhood curriculum development. In the said project, men met once per week to discuss issues of fatherhood. After evaluation of the project, it showed that 91 per cent felt that the fatherhood curriculum helped teach them parenting skills and improve their relationship with their children. Kavanaugh (1992) also established that one strategy used to fully involve fathers' participation in child development programmes in New Mexico was that of bringing fathers into schools and daycare centres which their children attended to help with child care. The programmes were designed to increase father-child interaction. In this project, fathers began by making toys with their children and playing with them at their level. The success of this project was attributed to balancing discussion with activities, inviting participants to meet face to face, having a male staff member, and making a formal contract with the fathers to attend.

Anell, Bruns and Chitiyo (2016) noted that one programme that could improve fathers' participation in child-rearing activities was a programme called *Steps Towards Effective, Enjoyable Parenting (STEEP)*. This programme works on the promise that secure attachment between the parent and infant establishes ongoing patterns of healthy interaction. Parents were taught to understand their child's development, respond sensitively and predictably to their child's needs and make decisions that ensure a safe and supportive environment. The programme targeted the father's knowledge, skills, and commitment to the fatherhood role. It also increased the support given to mothers by the fathers.

However, it was the wish of the researcher that if these strategies were also implemented in Zambia, they could yield positive results among fathers whose participation in child-rearing activities seems to be under construction as compared to those of grandmothers due to cultural beliefs in their respective societies.

5.9 Chapter Summary

Chapter Five discussed the findings on fathers' and grandmothers' involvement in child-rearing activities and their influence on the cognitive development of children in Kasama and Mungwi districts of Northern province Zambia. From the findings, it is clear that fathers and grandmothers were involved in different child-rearing activities such as nutrition, child care and early childhood education practices and that both fathers and grandmothers were moderately involved in nutrition activities. The Chapter however, showed that fathers' and grandmothers' involvement in early childhood education practices influenced the cognitive development of children. It was also evident that fathers and grandmothers were involved in specific cognitive stimulating activities that influenced the development of cognitive skills among children in Kasama and Mungwi districts. Lastly, the Chapter discusses the challenges fathers and grandmothers faced in their involvement in child-rearing activities. This was followed by a provision of possible strategies that could improve their full participation in child-rearing activities such as nutrition, child care and early childhood education practices.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Overview

Chapter Six broadly makes a summary, conclusion and recommendations arising from the study. It is divided into three sections. The first section provides a review of the parts of the study. This is followed by a summary of the main findings. Finally, the Chapter ends with the conclusion, recommendations and implications for future research.

Chapter One was extensively discussed. The study was guided by Urie Bronfenbrenner's (1979) Model of Ecological System as well as Super and Harkness' (1997) Developmental Niche. The models were adapted to make them more relevant to the study of fathers' and grandmothers' involvement in child-rearing activities. Through the application of the two models, the researcher was able to establish how fathers and grandmothers' involvement in early childhood education activities influences the cognitive development of children in Kasama and Mungwi Districts. Application of the two models also helped the researcher to understand the type of cognitive stimulating activities fathers and grandmothers were involved in that specifically influenced the cognitive development of children. The study was guided by five (5) objectives. A total of 310 participants were involved in the study. Cognitive assessment tools, structured questionnaires and semi-structured interview guides were used to collect data.

To ensure the reliability and validity of the data collected to support the study, research instruments were piloted in Lusaka District to strengthen them before actual data collection was done in Kasama and Mungwi Districts. Furthermore, Cronbach's Alpha was conducted on all instruments. Quantitative data were analysed using the Statistical Package for Social Sciences through which frequencies, percentages, linear regression and t-test results were generated to provide inferential statistics. Qualitative data were analysed using the thematic analysis method.

6.2 Conclusion

The following study findings emerged from the study:

6.2.1 Child-rearing Activities that Zambian Fathers and Grandmothers are Involved in

The study revealed that fathers and grandmothers were involved in childcare, nutrition, and early childhood education practices as child-rearing activities.

6.2.2 Levels of Involvement of Fathers and Grandmothers in Child-rearing Activities

Eighty-four percent of fathers and 84.7 per cent of grandmothers were moderately involved in nutrition activities such as providing healthy food, discussing the child's diet with the mothers, feeding and giving enough money to buy nutritious food for the child. On child care practices, 82 per cent of grandmothers were highly involved compared to fathers who had low involvement levels at 32 per cent. On early childhood education practices, 55 per cent of the fathers were highly involved compared to only 37 per cent of the grandmothers.

6.2.3 Performance of Children on Cognitive Skills According to Age and Gender

The results have shown a consistent pattern indicating that one age group (6-year-old children) performed better than the others (5-year-old children) in most executive functions. It was evident that maturation played a big role in children's performance. The study further, revealed mixed results with no consistent pattern indicating one gender performed consistently better than the other in all executive functions.

6.2.4 Impact of Fathers and Grandmothers' Involvement in Early Childhood Education Practices on Cognitive Development of Children

The study established a strong relationship between fathers' and grandmothers' involvement in early childhood education practices and children's cognitive skills. The more the father or grandmother is involved in the child's life, there is a highly consistent and positive influence on the child's cognitive abilities.

6.2.5 Comparing the Involvement of Fathers and Grandmothers in Early Childhood Education Practices and their Influence on Cognitive Development of Children

The results showed that for each unit increase in the fathers' involvement in early childhood education practices, there is an expected increase of 1.744 units in the child's cognitive skills. For each unit increase in the grandmothers' involvement in early childhood education

practices, there is an increase of 1.933 units in the child's cognitive skills. The difference in slopes indicates that, based on the collected data the effect of the grandmothers' involvement in early childhood education practices appears to be slightly larger effect on the child's cognitive development compared to fathers' involvement in early childhood education practices.

6.2.6 Specific Cognitive Stimulating Activities which Influenced Cognitive Development Skills of Children

The study established that fathers and grandmothers were involved in specific cognitive stimulating activities such as telling stories to children, singing songs to children, reading books to children, providing toys and colourful objects for children to develop senses, playing games, practicing the alphabet, practicing counting, practicing shapes and colours. Visiting interesting places and talking to children and naming commonly used objects were others cognitive stimulating activities fathers and grandmothers were involved in that enhanced cognitive skills among children.

6.2.6 Effect Size of Cognitive Stimulating Activities Fathers and Grandmothers were Involved in that Enhanced Cognitive Development among Children

Using Pearson r , the study showed that fathers generally had very large effect size across most activities such as providing toys and colourful objects for children to develop senses (0.83) and telling stories to children (0.78). Grandmothers had a very larger effect size (0.81) when playing games with children surpassing fathers significantly in this area. The study demonstrated difference strengths between fathers and grandmothers in terms of stimulating children's cognitive development across various cognitive stimulating activities.

6.2.7 Challenges faced by Fathers and Grandmothers in Being Involved in Child-rearing Activities

The study established that fathers had some challenges in being involved in child-rearing activities such as beliefs and cultural values in society, long working hours and the gender of the child. Meanwhile, grandmothers faced challenges such as a lack of money to buy food for their grandchildren, working long hours on farms and for some, not knowing how to read.

6.2.7 Strategies that could Improve Fathers and Grandmothers' Involvement in Child-rearing Activities

The study further highlighted strategies such as grandchildren spending their holidays at their grandmothers' place, sensitise fathers and grandmothers through radio and television programmes on the importance of their involvement in child-rearing activities, community and civic leaders play a big role in sensitising fathers and grandmothers and lastly formation of women's clubs at church. These strategies could improve fathers' and grandmothers' involvement in child-rearing activities.

6.3 Recommendations

Given the findings above, the following recommendations are made:

- (i) There is a need to use locally available cognitive stimulating activities by parents, grandmothers and schools to enhance cognitive skills among children aged between 5 and 6 years old.
- (ii) Given the recognition of fathers' crucial role in child development in this study, families must shift away from traditional, gendered divisions of parenting roles and embrace a more family-centered conceptualization of fatherhood which will promote the holistic development of children.
- (iii) Grandmothers serve as invaluable sources of support for families, there is a need for families to empower grandmothers with knowledge in nutrition and early childhood education skills necessary to enhance cognitive development among children.
- (iv) Community and civic leaders play a big role in sensitising both fathers and grandmothers on the importance of their involvement in child-rearing activities in communities. This would help remove wrong cultural beliefs that had impeded fathers and grandmothers from participating fully in child-rearing activities.
- (v) There is a need for the government (Ministry of Education) and other stakeholders that promote child development to come up with policies and programmes aimed at promoting effective fathers' and extended family members' involvement in early childhood education practices because the current policies lack consistent implementation.
- (vi) Looking at findings that fathers spent long working hours working in formal employment, the Zambian government needs to introduce friendly family policies and

practices such as flexible working hours and extension of paternity leave from the current 10 days to one month this will help fathers to effectively participate in child-rearing activities.

6.4 Future Research

More research is needed to ascertain how egalitarian policies in Zambia have changed the behaviour of Zambian fathers in terms of their involvement in child-rearing activities. It also would be a worthwhile contribution to the existing literature on fathers' involvement in child-rearing activities.

Since the study has established the grandmothers' involvement in child-rearing activities as well as their influence on the cognitive development skills of their grandchildren, further research is needed to establish the levels of grandfathers' involvement in child-rearing activities as well as their influence on social and emotional development of their grandchildren.

More studies on how child care is shared by parents in dual earners' families, with a focus on specific geographic locations and careers would be a worthwhile contribution to the existing literature on this topic.

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APPENDICES

Appendix: A: Biographical Data for Pupils

This instrument will be completed by the researcher who will interview one pupil at a time in an interview room. The researcher will use familiar language with the pupil for effective communication.

BIOGRAPHICAL DATA

DISTRICT:..... SCHOOL:.....

NAME:..... ID:.....

AGE:..... SEX:..... CLASS:.....

SECTION A HOME POSSESSIONS

Home possession index (HPI). Tick against the possession in the box below.

HP1	Do you have a television in your home?	Yes [] No []
HP 2	Do you have a stove at home?	Yes [] No []
HP3	Do you have electricity/solar at home?	Yes [] No []
HP 4	Do you have running water from any source, at home?	Yes [] No []
HP5	Do you have a flushable toilet?	Yes [] No []
HP6	Do you have a car at home?	Yes [] No []
HP7	Do you have at least two sets of clothes?	Yes [] No []
HP8	Do you have at least one pair of shoes?	Yes [] No []
HP9	Does the household own a radio?	Yes [] No []
HP10	Do you have a bed or mat to sleep on?	Yes [] No []
HP 11	Do you have cement or tiled floors in your home?	Yes [] No []

Appendix B: Pencil Taping Test

PENCIL TAPING TEST

MARK SHEET

PUPIL ID _____

AGE: _____ **SEX** _____

SCHOOL: _____ **GRADE/CLASS** _____

Give one pencil to the child and keep one pencil for yourself

Say,” we are going to play a new game now. When I tap my pencil on the table once (demonstrate), I want you to tap your pencil twice. Can you do that?”

Allow the child to practice until they tap correctly

“When I tap my pencil twice times, I want you to tap your pencil once. Can you do that?”

Allow a child to practice until they tap correctly

“When I tap my pencil three times, don’t tap your pencil at all. Now let’s try it.”

Tap once, then twice, then three times, then repeat. Allow the child to practice until they can do three sequences in a row correctly.

“Great, now we are ready to play the game. When I tap one time, I want you to tap two times. When I tap two times, I want you to tap one time. When I tap three times, don’t tap at all. Are you ready.” If child expresses that he/she is ready, begin.

Examiner Taps	Correct	Incorrect	
1			
2			
2			
2			
1			
1			
1			
3			
2			
1			
2			

3			
1			
1			
2			
1			
2			
2			
2			
1			
Total score 40	Total correct	Total errors	

Appendix C: Peabody Picture Vocabulary Test

PEABODY PICTURE VOCABULARY TEST

Practice:

I want you to look at some pictures with me. [Turn to practice item A]

See all the pictures on this page? [Pointing to each of the four pictures]

I will say a word, then I want you to put your finger on the picture of the word I have said.

Let's try. Put your finger on _____.

If the subject is correct:

That's fine. [Turn to practice item B]

Now put your finger on _____.

If the subject again makes the correct response, turn to practice item C, saying:

Good! Show me _____.

If the subject chooses the wrong illustration at any point, before going on to the next item, point out the correct response while saying:

You made a good try, but this is the correct answer.

Test:

Fine. Now I am going to show you some other pictures. Each time I say a word, you find the best picture of it. When we get further along, you may not be sure you know the meaning of the word, but I want you to look carefully at all the pictures anyway and choose the one you think is right.

Point to **[begin test items below]**

STEP 1

ITEM	WORD	KEY	RESPONSE	ERROR	DK
PPV1	Broken/ Icatobeka	2			
PPV2	Yawning/ Ukwaula	2			
PPV3	Tortoise/ Fulwe	1			
PPV4	Dressing/ Ukufwala	1			
PPV5	Picking/ Ukuswa	4			
PPV6	Pair/ Fibili	3			
PPV7	Pulling/ Ukutinta	1			
PPV8	Pouring/ Ukwitulula	4			
PPV9	Empty/ Tamuli	4			
PPV10	Liquid/ Amenshi	4			
PPV11	Washing/ Ukusamba	4			
PPV12	Terrified/ Ukutina	1			
PPV13	Sharing/ Ukwakana	2			
PPV14	Bucket/ Imbeketi	1			
PPV15	Tugging/ Ukutintana	2			
TOTAL					

STEP 2

ITEM	WORD	KEY	RESPONSE	ERROR	DK
PPV16	Full/ Ukwisula	2			
PPV17	Caterpillar/ Icishimu	3			
PPV18	Arguing/ Ukotalikana	1			
PPV19	Branch/ Umusambo	2			
PPV20	Chain/ Cheni	2			
PPV21	Goat/ Imbushi	4			
PPV22	Fighting/ Ukulwa	1			
PPV23	Root/ Umushila	2			
PPV24	Coming/ Ukwisa	3			
PPV25	Hoeing/ Ukulima	2			
PPV26	Printing/ Ukulemba/Ukupulinta	4			
PPV27	Time/ Inshita	3			
PPV28	Reading/ Ukubelenga	4			
PPV29	Leaking/ Ukutona	3			
PPV30	Injection/ Inshindano	4			
TOTAL					

Appendix D: Rapid Neurodevelopment Assessment Tool (RNDA)

RNDA Neurodevelopmental Assessment Tool

Child's ID.....	Age.....	Area.....
1. Expressive Language Able=1 Not able=2		
• Sentence of 4 to 6 words		----- 1
• Repeats complex sentences		----- 2
• Use of pronoun (my, your)		----- 3
• Use past and future tense		----- 4
• Use proposition (on, under, in front, behind)		----- 5
• Takes part in conversation		----- 6
• Able to categorise things		----- 7
• Name 10 objects in basket		----- 8
• Can do 2-syllable recall		----- 9
2. Cognition Able=1 Not able=2		
• Matches shapes on board (circle, square, triangle)		-----
10		
• Matches colours (red, yellow, green, blue)		-----
11		
• Understands (big/small, more/less, right/left)		-----
13		
• Draw a man		-----
14		
• Draw square		-----
15		
• Draw triangle		-----
16		
• Build a house with 9 cubes		-----
17		
• Names of days		-----
18		
• How many days in a week?		-----
19		
• If you have 2 pencils and I give you 2, how many pencils will you have?		-----
----- 20		
7. Behaviour Able=1 Not able=2		
• Demonstrate poor peer play		-----
- 21		
• Acts very aggressive towards other people		-----
22		
• Acts extremely withdrawn and shy		-----
23		
• Shows odd/ unusual behaviour		-----
24		
• Has a temper tantrum		-----
25		
• Is hyperactive		-----
26		

- Is inattentive
27
- Shows extreme fear

Appendix E: Questionnaire for Fathers

Socio-Demographic Data

1. Where is your home located in the district?

(a) Urban area:

(b) Peri-urban area:

(c) Rural area

2. When were you born?.....

3. How old are you (in years)?

(a) < 24 years

(b) 25 – 29 years

(c) 30 – 34 years

(d) 35 – 39 years

(e) 40 – 44 years

4. Are you married?

(a) Yes

(b) No

5. What is your wife doing?

(a) Working

(b) Housewife

(c) Businesswoman

6. What is your level of education?

(a) None

- (b) Complete primary
- (c) Complete secondary
- (d) Higher than secondary

7. Are you in employment?

- (a) Yes
- (b) No

8. If yes what type of employment?

- (a) Formal employment
- (b) Informal employment

9. How many hours do you spend at work?

- (a) <5
- (b) 6 - 8
- (c) ≥ 9

10. Are you satisfied with your job?

- (a) Yes
- (b) No

11. What is the level of satisfaction?

- (a) Very satisfied
- (b) Satisfied
- (c) Unsatisfied
- (d) Very unsatisfied

12. Based on your response to question 10, how does your work experience affect your relationship with your child?.....

.....
.....

Household characteristics

13. What type of family do you have?

- (a) Nuclear family
- (b) Extended family
- (c) Single-parent family

14. How many are in the house?

- (a) 1-3
- (b) 4-6
- (c) ≥ 7

15. What is your income?

- (a) 500-1000
- (b) 1100- 1600
- (c) 1700-2000
- (d) ≥ 2100

Child's information

16. Gender of child male [] Female []

17. Age of a Child

- (a) 5

(b) 6

18. Child's number of siblings

(a) 1

(b) 2

(c) 3

(d) 4

19. From your experience as a parent what type of cultural child-rearing activities do you do/teach to your child? Circle on the cultural child development activities you teach your child.

(a) Washing plates

(b) Sweeping

(c) Farming activities

(d) Cooking

Other(S) specify.....

20. How do you impart cultural child development skills to your child?

(a) Through teaching

(b) Through imitating

(c) Through storytelling

(d) Other (s) Specify

21. How do you understand the term cognitive stimulating activities for children?.....

.....

....

22. Below are some of the cognitive stimulating activities that enhance the cognitive development of children, tick the cell that corresponds to your frequency involvement in the activities you perform with your child as a parent.

Activity	Very often	Quite often	Sometimes	Almost never
Telling them stories				
Singing songs to them				
Reading books to them				
Providing toys and colourful objects for them to develop their senses				
Playing games with them				
Practising alphabet				
Practising counting				
Practising shape and colours				
Visiting interesting places				
Talking with your child and naming commonly used objects				

23. Does fathers' involvement in child-rearing activities seen as essential in the acquisition of cognitive development skills among children ages 5 to 6 years?

- (a) Not at all
- (b) Sometimes
- (c) Always

24. In your opinion does the gender of your child influence your participation in child-rearing activities?

- (a) Not at all
- (b) In some situations

(c) Sometimes, but not always

(d) Always

25. If your response in 24 is, in some situations, sometimes, but not always or always, how does it affect your participation in child development programmes?.....

.....

....

26. Based on your experience as a father how frequently is your wife is being involved in child development programmes for your child?

(a) Almost never

(b) Sometimes

(c) Quiet often

(d) Very often

27. From your observations which side of grandparents is mostly involved in child development programmes?

(a) Maternal side

(b) Paternal side

28. Based on your response to question 27, what could be the reasons for them being mostly involved in child development programmes?

.....

.....

.....

29. How often are you involved in the following nutrition activities as child development programmes? Tick the activities you are frequently involved.

Activity	Very often	Quiet often	Sometimes	Almost never

Providing healthy food				
Giving the mother enough money to buy nutritious foods for the child				
Discussing the child's diet issues with the mother				
Feeding the child				

30. How do you ensure that mothers or caregivers give the child balanced meals?.....

.....

.....

.....

.....

31. Tick on the following Child care practices you are involved in as child development programmes

Activity	Very often	Quiet often	Sometimes	Almost never
Bathing the child				
Taking the child to the hospital				
Taking the child for immunisation				
Taking the child for under five checkups				
Putting the child to sleep				

32. What would be your response if you are asked by your wife to be involved in child care practices mentioned above?.....

.....

33. Tick on the following early childhood education practices you are involved in as a father

Activity	Very often	Quiet often	Sometimes	Almost never
Taking the child to school				
Being involved in homework given				
Teaching the child				
Reading a book with a child				
Teaching the child good habits and values eg brushing the teeth				
Teaching the child responsibilities eg putting the uniform in a right place after knocking off from school				

34. From your experience as a father, what changes have you seen in your child as a result of being involved in the above early childhood education activities?.....

.....

.....
.....

35. From your experience as a father how can you rate your accessibility and availability to your family? *Rate your accessibility and availability by circling on the answer below appropriate:*

- (a) Poor
- (b) Fair
- (c) Good
- (d) Very Good

36. If the response to the question above is, “poor or fair” what factors have contributed to this situation?.....

.....
.....
.....

37. Do the interactions you have with your child allow him or her to build confidence?

- (a) Not sure
- (b) Disagree
- (c) Agree

38. If your response in question 37 agrees, in which way have you noticed that confidence in your child?.....

.....

39. If your response in question 37 disagrees, how can you help your child build confidence in his or her daily child development activities?.....

.....

40. Based on your experience as a father what challenges do you face in being involved in Child development programmes? Circle on the challenges you face

- (a) Age of a child
- (b) Beliefs and culture
- (c) Long working hours
- (d) Sex of a child
- (e) Temperament of a child
- (f) Marital relationship
- (g) Stress
- (h) Number of children in the household
- (i) Other (S)
specify.....

41. Suggest what can be done to improve paternal involvement in child development programmes

.....
.....
.....
.....

Thank you for your cooperation

Appendix F: Questionnaire for Grandmothers

Socio-Demographic Data

1. Where is your home located in the district?

(a) Urban area:

(b) Peri-urban area:

(c) Rural area

2. How old are you (in years)?

(a) 45

(b) 46-50

(c) 51-54

(d) 55 – 60 years

(e) 61 – 65 years

(f) ≥ 66

3. What is your level of education?

(a) None

(b) Complete primary

(c) Complete secondary

(d) Higher than secondary

Household characteristics

4. What type of family do you have?

(a) Nuclear family

(b) Extended family

(c) Single-parent family

5. How many are in the house?

(a) 1-3

(b) 4-6

(c) ≥ 7

6. From your experience as a grandmother what type of cultural child development programmes (activities) do you teach to your child?

(a) Washing plates

(b) Sweeping

(c) Farming activities

(d) Cooking

7. How do you impart cultural child development skills to your grandchild?

(a) Through teaching

(b) Through imitating

(c) Through storytelling

8. Below are some of the cognitive stimulating activities that enhance cognitive development in children, tick the cell that corresponds to your frequency involvement in the activities you perform with your grandchild.

Activity	Very often	Quite often	Sometimes	Almost never
Telling them stories				
Singing songs to them				
Reading books to them				
Providing toys and colourful objects for them to develop their senses				
Playing games with them				
Practising alphabet				
Practising counting				
Practising shape and colours				

Visiting interesting places				
Talking with your child and naming commonly used objects				

9. Does grandmothers' involvement in child development programmes seen as essential in the acquisition of cognitive development skills among children ages 5 to 6?

- (a) Not at all
- (b) Sometimes
- (c) Always

10. Apart from being involved in cognitively stimulating activities, how often are you involved in the following nutrition activities as child development programmes? Tick on the activities you are frequently involved.

Activity	Very often	Quiet often	Sometimes	Almost never
Providing healthy food				
Does your give you enough money to buy nutritious foods for your grandchild				
Discussing the child's diet issues with the mother				
Feeding the child				

11. Tick the following Child care practices you are involved in as child development programmes.

Activity	Very often	Quiet often	Sometimes	Almost never
Bathing the child				
Taking the child to the hospital				
Taking the child for immunisation				
Taking the child for under five check-ups				
Putting the child to sleep				

12. What would be your response if you are asked by your child to be involved in child care practices mentioned above?.....

.....

.....

13. Tick on the following early childhood education practices you are involved in as a grandmother

Activity	Very often	Quiet often	Sometimes	Almost never
Taking the child to school				
Being involved in homework given				
Teaching				
Reading a book with a child				
Teaching the child good habits and values eg brushing the teeth				
Teaching the child responsibilities eg putting the uniform in a right place after knocking off from school				

14. From your experience as a grandmother, what changes have you seen in your grandchild as a result of being involved in the above early childhood education practices?.....

.....

15. In your opinion as a grandmother how can you rate your accessibility and availability toward the acquisition of cognitive development skills of your grandchild? *Rate your accessibility and availability by circling on the answer below appropriate:*

- (a) Poor
- (b) Fair
- (c) Good
- (d) Very Good

16. If the response to the question above is, “poor or fair” what factors have contributed to this situation?.....

.....

17. Based on your experience as a grandmother what challenges do you face in being involved in Child development programmes? Circle on the challenges you face

- (a) Age of a child
- (b) Beliefs and culture
- (c) Long working hours
- (d) Sex of a child
- (e) Temperament of a child
- (f) Marital relationship
- (g) Stress
- (h) Number of children in the household
- (i) Other (S)
specify.....

18 Suggest what can be done to improve grandmothers' involvement in child development programmes

.....

.....

.....

.....

Thank you for your cooperation

Appendix G:Approval Letter



THE UNIVERSITY OF ZAMBIA
DIRECTORATE OF RESEARCH AND GRADUATE STUDIES
RESEARCH DEPARTMENT
APPROVAL OF STUDY

17th November, 2020.

REF NO.HSSREC-2020-OCT-004

John Clement Kabungo,
LUSAKA

Dear Mr. Kabungo,

RE: "ASSESSING THE INVOLVEMENT OF FATHERS AND EXTENDED FAMILY MEMBERS IN CHILD DEVELOPMENT PROGRAMMES IN KASAMA AND LUSAKA DISTRICTS"

Reference is made to your protocol dated 1st October, 2020. HSSREC resolved to approve this study and your participation as Principal Investigator for a period of one year.

REVIEW TYPE	ORDINARY REVIEW	APPROVAL NO. HSSREC-2020- AUG-002
Approval and Expiry Date	Approval Date: 17 th November, 2020	Expiry Date: 16 th November, 2021
Protocol Version and Date	Version - Nil.	16 th November, 2021
Information Sheet, Consent Forms and Dates	• English.	To be provided
Consent form ID and Date	Version - Nil	To be provided
Recruitment Materials	Nil	Nil
Other Study Documents	Questionnaire.	
Number of Participants Approved for Study		

Specific conditions will apply to this approval. As Principal Investigator it is your responsibility to ensure that the contents of this letter are adhered to. If these are not adhered to, the approval may be suspended. Should the study be suspended, study sponsors and other regulatory authorities will be informed.

Conditions of Approval

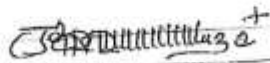
- No participant may be involved in any study procedure prior to the study approval or after the expiration date.
- All unanticipated or Serious Adverse Events (SAEs) must be reported to HSSREC within 5 days.
- All protocol modifications must be approved by HSSREC prior to implementation unless they are intended to reduce risk (but must still be reported for approval). Modifications will include any change of investigator/s or site address.
- All protocol deviations must be reported to HSSREC within 5 working days.
- All recruitment materials must be approved by HSSREC prior to being used.
- Principal investigators are responsible for initiating Continuing Review proceedings. HSSREC will only approve a study for a period of 12 months.
- It is the responsibility of the PI to renew his/her ethics approval through a renewal application to HSSREC.
- Where the PI desires to extend the study after expiry of the study period, documents for study extension must be received by HSSREC at least 30 days before the expiry date. This is for the purpose of facilitating the review process. Documents received within 30 days after expiry will be labelled "late submissions" and will incur a penalty fee of K500.00. No study shall be renewed whose documents are submitted for renewal 30 days after expiry of the certificate.
- Every 6 (six) months a progress report form supplied by The University of Zambia Humanities and Social Sciences Research Ethics Committee as an IRB must be filled in and submitted to us. There is a penalty of K500.00 for failure to submit the report.
- When closing a project, the PI is responsible for notifying, in writing or using the Research Ethics and Management Online (REMO), both HSSREC and the National Health Research Authority (NHRA) when ethics certification is no longer required for a project.
- In order to close an approved study, a Closing Report must be submitted in writing or through the REMO system. A Closing Report should be filed when data collection has ended and the study team will no longer be using human participants or animals or secondary data or have any direct or indirect contact with the research participants or animals for the study.

- Filing a closing report (rather than just letting your approval lapse) is important as it assists HSSREC in efficiently tracking and reporting on projects. Note that some funding agencies and sponsors require a notice of closure from the IRB which had approved the study and can only be generated after the Closing Report has been filed.
- A reprint of this letter shall be done at a fee.
- All protocol modifications must be approved by HSSREC by way of an application for an amendment prior to implementation unless they are intended to reduce risk (but must still be reported for approval). Modifications will include any change of investigator/s or site address or methodology and methods. Many modifications entail minimal risk adjustments to a protocol and/or consent form and can be made on an Expedited basis (via the IRB Chair). Some examples are: format changes, correcting spelling errors, adding key personnel, minor changes to questionnaires, recruiting and changes, and so forth. Other, more substantive changes, especially those that may alter the risk-benefit ratio, may require Full Board review. In all cases, except where noted above regarding subject safety, any changes to any protocol document or procedure must first be approved by HSSREC before they can be implemented.

Should you have any questions regarding anything indicated in this letter, please do not hesitate to get in touch with us at the above indicated address.

On behalf of HSSREC, we would like to wish you all the success as you carry out your study.

Yours faithfully,



Dr. J. Mwanza
DR. JASON MWANZA
 Dip. Clin. Med. Sc., BA.M.Soc., PhD

CHAIRPERSON
THE UNIVERSITY OF ZAMBIA HUMANITIES AND
SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE - IRB

cc: Director, Directorate of Research and Graduate Studies
 Assistant Director (Research), Directorate of Research and Graduate Studies
 Assistant Registrar (Research), Directorate of Research and Graduate Studies