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Evaluating the Effects of Fundamental Skills among Mothers in Reducing Child Mortality During the First 1000 Days of Childhood: A Case Study of Kanyama Constituency of Lusaka District

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Abstract

The study empirically evaluates the effects of fundamental maternal skills on reducing child mortality during the first 1000 days of life in Kanyama Constituency, Lusaka. A descriptive cross-sectional design was employed, utilizing a structured questionnaire to collect data from 50 randomly sampled mothers with children under two years. Data were analyzed using descriptive statistics, chi-square tests, and correlation analysis. The results reveal that 77.1% of mothers could recognize danger signs in childhood illness, and 50% regularly attended clinics. However, only 28% practiced exclusive breastfeeding for the recommended six months. A statistically significant relationship was found between household income and dietary diversity ($\chi^2 = 20.12$, $p = 0.003$), and between maternal employment status and exclusive breastfeeding duration ($\chi^2 = 21.40$, $p = 0.011$). A strong positive correlation ($r = 0.5962$, $p = 0.0000$) was observed between confidence in healthcare decision-making and nutritional knowledge. Maternal education programs demonstrated effectiveness, with 78% of participants changing childcare practices post-training, yet 36% of mothers remained unaware of such programs. The study concludes that fundamental maternal skills are decisive for child survival but are constrained by structural barriers. It recommends policy reforms for inclusive maternal education, poverty reduction, and supportive workplace policies to enhance the effectiveness of maternal skills in reducing child mortality.

Keywords: Sustainable Development Goals (SDGs), Child Mortality, UNICEF

1. Introduction

The global decline in child mortality, marked by a 59% reduction in the under-five mortality rate since 1990, represents a profound achievement in global health, yet it masks a catastrophic and increasingly concentrated failure in equity (UN IGME, 2024) [56]. While the Sustainable Development Goals (SDGs) envisioned a future where no child dies from preventable causes, progress has decisively stalled, with sub-Saharan Africa bearing the overwhelming burden of over 80% of the 4.8 million annual under-five deaths (WHO, 2023; Cutts *et al*., 2019) [59, 14]. This stagnation signals a critical flaw in prevailing strategies; historical evidence from now-developed nations demonstrates that structural investments in public health and education were pivotal, yet contemporary efforts in low- and middle-income countries remain disproportionately focused on short-term biomedical fixes, neglecting the foundational socio-economic and skill-based determinants of survival (Hertz *et al*., 2020) [22]. The result is a world where a child's fate is increasingly determined by their geographic and economic birthplace, underscoring an urgent need for a paradigm shift back to holistic, structurally-grounded interventions.

Zambia epitomizes this troubling dichotomy of national progress alongside localized collapse. Despite a commendable 64% reduction in national under-five mortality between 2001 and 2008, this aggregate success shatters upon contact with the reality of impoverished urban enclaves like Lusaka's Kanyama Constituency (Kamanga *et al*., 2022) [27]. Here, neonatal and infant mortality rates persist at devastating levels of 24 and 42 per 1,000 live births, driven not by rare diseases, but by entirely manageable adversaries: malnutrition (21%) and neonatal infections (16%) (Central Statistical Office of Zambia, 2023; Mwale *et al*., 2023) [10, 42]. The constituency is trapped in a vicious cycle where urban overcrowding, financial barriers (58%), and

transportation challenges (53%) paralyze healthcare access, while systemic failures such as critical blood supply shortages and reported mistreatment by providers actively deter facility-based care, perpetuating a deadly reliance on traditional practices and rendering national health policies ineffective at the grassroots level (Klouda *et al*., 2018; Mwale *et al*., 2023) [32, 42].

Within this context of systemic failure, the role of the mother becomes both the last line of defense and a tragically under-optimized resource. Current maternal education programs, while well-intentioned, operate in a vacuum, failing to address the structural inequities that suffocate their potential; consequently, only 34% of mothers in Kanyama consistently access antenatal care, and 41% lack critical breastfeeding knowledge (Mudhune *et al*., 2020; Klouda *et al*., 2018) [41, 32]. This study posits that the fundamental skills of mothers in healthcare navigation, danger-sign recognition, and nutritional practice are the crucial mediating factor between a broken system and a child's survival. Therefore, this research interrogates the complex interplay between maternal capability and structural barriers in Kanyama, moving beyond the simplistic question of if mothers have skills, to critically examine how these skills can be empowered to overcome systemic failures and forge a tangible pathway toward achieving SDG 3.2 in the nation's most vulnerable communities.

1.1 General Objective

To evaluate the effects of fundamental skills among mothers on reducing child mortality during the first 1000 dayas of childhood in Kanyama Constituency of Lusaka District.

1.1.1 Specific Objectives

1. To assess how fundamental skills among mothers influence healthcare decision-making during the first 1000 days of childhood in Kanyama Constituency.
2. To examine the impact of maternal fundamental skills on child nutrition outcomes during the first 1000 days of childhood in Kanyama Constituency.
3. To evaluate the effectiveness of maternal education programs in reducing child mortality in Kanyama Constituency of Lusaka District.

1.2 Theoretical Framework

Anchored in Amartya Sen's Capability Approach, this study fundamentally reorients the analysis of child mortality from a narrow focus on biomedical outcomes or resource availability to a broader evaluation of maternal freedoms and agency (Sen, 1999) [54]. Sen's framework posits that development is the expansion of human "capabilities" the substantive freedoms to achieve valued "functionings" like a healthy life and that inequities in survival stem not from a lack of commodities but from a failure to convert them into well-being due to social, economic, and structural constraints (Alkire, 2005; Sen, 1999) [3, 54]. This lens is critically applied to the three research objectives: first, by conceptualizing healthcare decision-making not merely as knowledge but as a capability to navigate systems effectively, shaped by autonomy and information access (Yan *et al*., 2018); second, by analyzing child nutrition as an outcome contingent on the mother's capability to secure and provide nutritious food, a freedom heavily mediated by poverty and gender equity (Nussbaum, 2011) [45]; and third, by evaluating maternal education programs not for knowledge transfer alone, but for their success in expanding mothers' capabilities by dismantling the systemic barriers such as financial inaccessibility and understaffed clinics that prevent them from acting on their skills (Klouda *et al*., 2018) [32]. Thus, the Capability Approach provides a transformative lens, framing maternal skills as dynamic competencies enabled or constrained by the structural realities of Kanyama, ensuring this study critiques not only individual-level competencies but also the imperative for systemic reforms to make child survival a universally attainable functioning (Kamanga *et al*., 2022; UN IGME, 2024) [27, 56].

2.1 Influence of Fundamental Maternal Skills on Healthcare Decision-Making During the First 1000 days of Childhood

Globally, maternal skills are recognized as a critical determinant in navigating health systems and improving child survival, yet their efficacy is profoundly shaped by regional healthcare infrastructures and socio-economic contexts. A systematic review by Declercq *et al*. (2022) [15] confirms that maternal education and competencies are consistently associated with superior health outcomes, a relationship amplified in high-income nations with robust systems; in Europe, the EURO-PERISTAT (2021) [17] study found skilled mothers were 20% more likely to adhere to vaccination schedules, though Hagen *et al*. (2023) [20] caution that socio-economic disparities persist even there. In North America, Hoyert (2023) [24] demonstrated that skill-based training correlated with a 12% drop in preventable infant deaths, yet MacDorman *et al*. (2021) [36] contend that systemic racism can undermine this potential. Conversely, in regions with weaker systems, such as South America and parts of Asia, skills act as a vital compensatory mechanism; studies by Restrepo-Méndez *et al*. (2022) [53] in Brazil, Colombia, and Peru and Wang *et al*. (2024) in China showed that structured training reduced infant mortality by 18% and 15%, respectively, by improving care-seeking. However, the WHO (2025) and UNICEF (2024) uniformly warn that without addressing equitable access, skill-building interventions risk leaving the most marginalized behind, a challenge also evident in the complex interplay of culture and modern medicine noted in studies from Bangladesh (Rahman *et al*., 2023) [52] and South Korea (Lee & Kim, 2022) [34].

In Sub-Saharan Africa, the nexus of maternal skills, cultural practices, and healthcare access creates a complex landscape for child survival. Quantitative evidence from Nigeria (Ogunleye *et al*., 2021) [46] and Ethiopia (Kebede *et al*., 2022) [29] establishes that educated mothers are significantly more likely to seek timely care and practice exclusive breastfeeding. However, this individual agency is often mediated by powerful traditional forces; qualitative work in South Africa (Dlamini *et al*., 2020) [16] revealed that cultural beliefs led 70% of mothers to delay clinic visits, while a quasi-experimental study in Kenya (Mwangi *et al*., 2022) [43] proved that integrating traditional birth attendants into the formal system boosted postnatal visits by 35%. The critical link between access and skill application is further illustrated by research in South Africa (Nkonki *et al*., 2021) [44], which found that mere proximity to a clinic was insufficient without the health literacy to use it effectively, and in Malawi (Phiri *et al*., 2023) [50], where community health worker programs successfully built this literacy, increasing timely fever treatment by 45%. Systematic

reviews of interventions (Agyemang *et al*., 2023 [2]; Turay *et al*., 2022) affirm that practical, hands-on training is most effective, reducing neonatal mortality by up to 22%, but they consistently highlight that sustainable impact requires ongoing support and addressing deep-seated structural barriers.

Within the Zambian context, and specifically in Kanyama Constituency, this global and regional discourse is reflected in a tension between the demonstrable power of maternal skills and the overwhelming nature of structural constraints. Local studies provide compelling evidence for skill-building: Mutale *et al*. (2020) found mothers with health education were 25% more likely to seek care within 24 hours, and a UNICEF (2021) [57] intervention in Kanyama itself led to a 20% increase in clinic visits and a 12% reduction in neonatal deaths. Government data from the ZDHS further corroborates the foundational role of maternal literacy in reducing infant mortality (Ministry of Health, 2020) [40]. However, potent counter-arguments emphasize systemic failure. Kapata *et al*. (2022) [28] identified that physical distance to clinics in Kanyama was a more decisive factor in care-seeking delays than maternal knowledge, while Chanda and Zulu (2021) [11] documented how cultural preferences for traditional remedies directly compete with skilled decision-making. A synthesizing view from Mwila (2023) suggests that the most realistic path forward lies in synergy, where maternal skills such as the ability to leverage community health workers empower mothers to navigate and partially overcome structural gaps, positioning maternal capability not as a silver bullet but as a crucial component of a multi-faceted, equity-driven strategy for child survival.

2.2 Impact of Maternal Fundamental Skills on Child Nutrition Outcomes

Globally, the evidence unequivocally establishes that maternal skills are a foundational determinant of child nutritional status, with education and health literacy serving as powerful levers for improving outcomes. A systematic review (International Journal of Child Care and Education Policy, 2023) [26] confirmed that nutritional education significantly enhances maternal knowledge and skills ($p < 0.001$), directly correlating with improved child outcomes such as increased birth weight. This global pattern is reflected across diverse economic contexts: in North America, Pourat *et al*. (2022) [51] found that mothers with higher health literacy were significantly more likely to consult credible nutritional sources (OR = 2.15), while Ohly's (2022) review demonstrated that programs like WIC, which combine food provision with education, improved household food security by 30%. Research from Asia further solidifies this; a meta-analysis by Gupta *et al*. (2025) [19] concluded that maternal education reduces stunting risk by 22% across the continent, with country-specific studies in India (Patel *et al*., 2021) [49], South Korea (Kim *et al*., 2022) [30], and Bangladesh (Hossain *et al*., 2023) [23] showing that education, health literacy, and practical hygiene skills lead to a 35% reduction in stunting, a 28% higher rate of exclusive breastfeeding, and a 20% reduction in wasting, respectively. However, the efficacy of these skills is not automatic; it is mediated by structural factors, as noted in a UNICEF (2024) report from Pakistan and critiques from Leroy *et al*., which highlight that education alone may be insufficient without concurrent material support and that cultural beliefs can counteract knowledge application.

Within Sub-Saharan Africa, the relationship between maternal skills and child nutrition is both pronounced and complex, deeply intertwined with poverty, cultural practices, and mental health. A strong body of evidence affirms the transformative potential of maternal capabilities: in Ethiopia, Gebre *et al*. (2020) [18] found that primary education reduced child stunting by 40%, and in Ghana, Amugsi *et al*. (2020) [4] showed that health literacy doubled the odds of exclusive breastfeeding (OR = 2.1). Practical skill interventions have proven similarly effective, with Bazzano *et al*. (2021) [6] in Uganda demonstrating that training in preparing local foods increased children's dietary diversity by 25%, and Kimani-Murage *et al*. (2021) [31] in Kenya reporting a significant improvement in weight-for-length z-scores ($p < 0.001$) from nutrition workshops. However, a consistent counter-narrative emphasizes the limitations of a purely skill-based approach. Researchers like Ijarotimi (2021) in Nigeria and Zewotir *et al*. (2023) in South Africa contend that poverty and food insecurity severely constrain the application of maternal knowledge, while Hanlon *et al*. (2022) [21] in Malawi revealed that maternal depression reduces responsive feeding by 30%, and Okwaraji *et al*. (2022) [48] noted that inconsistent healthcare access diminishes the benefits of health literacy. This creates a clear consensus: while maternal skills are necessary, their impact is often moderated by broader socio-economic and psychological barriers that demand holistic intervention strategies.

Focusing on Zambia, the literature reveals a critical interplay between promising skill-based initiatives and the persistent structural challenges that define settings like Kanyama Constituency. National data and studies underscore the protective effect of maternal education; Bwalya *et al*. (2025), using ZDHS data, confirmed that higher educational attainment significantly reduces child stunting and underweight, a finding historically supported by Stuebing (1997) who linked maternal schooling to better comprehension of health messages. Institutional efforts by the NFNC and UNICEF Zambia explicitly aim to build practical maternal skills in breastfeeding and complementary feeding, acknowledging their centrality to child nutrition. However, the reality on the ground tempers this optimism. Research by Mwape *et al*. (2024) and others point to the mitigating effects of severe food insecurity affecting 3.62 million Zambians (2024-2025) and high food inflation (17.6% in 2024), which cripple a mother's ability to act on her knowledge, as evidenced by the stark gap between high breastfeeding initiation and abysmally low dietary diversity (only 3.5%). This has led to a nuanced understanding of the role of maternal skills over time; Phiri *et al*. (2023) [50] observed that while maternal education was initially a dominant factor in reducing child mortality, its direct impact on nutrition may now be overshadowed by the scale of systemic health interventions and entrenched poverty. Therefore, in the Zambian context, maternal skills are best viewed not as a standalone solution but as an essential component within a broader, integrated framework that must simultaneously address economic empowerment, food systems, and accessible healthcare to effectively combat child malnutrition.

2.3 Effectiveness of Maternal Education Programs in Reducing Child Mortality

Globally, the causal link between maternal education and reduced child mortality is firmly established, with systematic reviews and quasi-experimental studies providing robust evidence of its transformative power. A landmark meta-analysis in The Lancet (2021) demonstrated that each additional year of maternal education is associated with a significant reduction in under-5 mortality, a finding corroborated by Mensch *et al*. (2019) [39] who established causality in low and middle-income countries (LMICs). This global pattern is evident across diverse regions: in Vietnam, Wu (2022) [60] used a natural experiment to show that a one-year reduction in maternal education increased under-five mortality by 3.4 percentage points, while in India, Huq *et al*. (2023) [25] found that secondary education lowered the odds of child mortality by 34%. Similarly, studies in Bangladesh (Huq *et al*., 2008; Rahman *et al*., 2020) and China (Liu *et al*., 2012 [35]; National Health Commission, 2023) trace declines in child mortality to rising maternal education levels, which empower mothers to adopt healthier behaviors, utilize healthcare effectively, and delay age at first birth. Even in high-income nations like the United States (Sosnaud *et al*., 2017) [55] and across Europe (Cresswell *et al*., 2022) [12], socioeconomic disparities in child survival are persistently linked to educational attainment, confirming that maternal education remains one of the most powerful and consistent determinants of child survival worldwide.

In Sub-Saharan Africa, the evidence for maternal education is compelling, yet it reveals critical nuances regarding the mechanisms and types of education that are most effective. Quasi-experimental studies provide the strongest causal claims; Makate and Makate (2019) [37] leveraged Universal Primary Education reforms to show that each additional year of maternal schooling reduced under-5 mortality by 10.0% in Malawi and 16.6% in Uganda. In Ethiopia, Abebe *et al*. (2019) [1] found that secondary education conferred a 45% reduction in the odds of infant mortality. However, the pathway is not limited to formal schooling. Barro *et al*. (2025) in Burkina Faso demonstrated that adult literacy programs, by enhancing economic empowerment, reduced under-5 mortality by 26%. Furthermore, innovative mHealth interventions (Bossman *et al*., 2022) [8] have proven effective in improving health-seeking behaviors like skilled birth attendance, which are critical proximal determinants of survival. A key insight from the regional literature is that the effectiveness of education is mediated by contextual factors; it is most powerful when it translates into tangible skills, economic agency, and the empowerment to challenge harmful traditional norms, yet its impact can be constrained by extreme poverty, gender inequality, and weak health systems that limit a mother's ability to apply her knowledge.

Within Zambia, the potential of maternal education is acknowledged, yet a significant gap exists in the documentation and evaluation of targeted, standalone educational programs. National data from the ZDHS (Zambia Statistics Agency, 2024) [61] consistently shows a strong gradient where higher maternal education correlates with improved child health outcomes, including lower stunting and underweight rates. A foundational study in urban Lusaka by Mallard *et al*. (2014) [38] confirmed that maternal education improves child growth through better feeding practices. However, post-2020, specific, well-documented maternal education programs focused squarely on child mortality are scarce. Initiatives like the National Partnership for Maternal, Newborn and Child Health (WHO, 2008) and the Safe Motherhood 360+ program (USAID, 2020) have integrated educational components within broader health system strengthening efforts, but their isolated impact is difficult to ascertain. This stands in contrast to neighboring Zimbabwe, where Chirwa *et al*. (2015) quantified a 21% decline in child mortality from secondary education. Therefore, while the association between maternal education and child survival in Zambia is clear, the current policy landscape, as reflected in the National Health Strategic Plan (2022-2026), favors integrated approaches. This underscores a critical research and programming gap: the need for robust, evidence-based maternal education programs specifically designed and evaluated for their direct impact on reducing child mortality in high-risk, resource-constrained settings like Kanyama Constituency.

2.4 Literature Gap

While the extant literature robustly establishes the global and regional significance of maternal skills and education for child survival, a critical gap persists in context-specific, mechanistic studies within Zambia, particularly in high-density, low-resource urban settings like Kanyama Constituency. Existing research, both internationally and within Zambia, often treats maternal skills as a monolithic input or correlates them broadly with outcomes, failing to dissect which specific, fundamental competencies such as danger-sign recognition versus practical nutrition management are most catalytic and how they interact with the intense structural barriers of poverty, fragmented healthcare, and cultural practices unique to such locales. Furthermore, while the positive association between maternal education and child health is documented in national surveys, there is a stark scarcity of empirical evaluations of targeted, standalone maternal education programs in Zambia from 2020 onwards, leaving policymakers without a clear, evidence-based blueprint for program design and implementation. This gap underscores the urgent need for research that not only identifies the precise skills with the highest leverage on child mortality in Kanyama but also empirically tests integrated intervention models that pair skill-building with systemic support, thereby translating the well-established theoretical value of maternal capabilities into actionable, life-saving practice.

3. Methodology

3.1 Research Design

A descriptive cross-sectional design was employed, facilitating the collection of data at a single point in time to quantify maternal skills, examine their relationships with child health outcomes, and evaluate program effectiveness. This approach was selected for its efficiency and feasibility in a resource-constrained setting, providing a snapshot of current practices without manipulating variables (Bryman, 2016; Creswell & Creswell, 2018) [9, 13].

3.2 Target Population

The study focused on mothers aged 15-49 with children under one year old in Kanyama Constituency, the primary group for understanding skill application in child health. Based on 2023 Lusaka District Health Office records, the

target population consisted of approximately 1,200 eligible mothers, providing a representative pool for sampling.

3.3 Sampling Design
A stratified random sampling technique was utilized to ensure proportional representation across Kanyama's 15 wards. By dividing the constituency into strata based on ward boundaries and randomly selecting participants from each, this approach minimized selection bias and enhanced the generalizability of findings across diverse socio-economic contexts (Taherdoost, 2016).

3.4 Sample Size Determination
The sample size was determined to be 50 mothers using the Krejcie and Morgan (1970) [33] formula for small populations, ensuring a 95% confidence level and 10% margin of error. This sample size balanced statistical reliability with practical constraints of limited funding and time (Adam, 2020).

3.5 Data Collection Tool
Data were collected through face-to-face administration of a structured questionnaire featuring closed-ended and Likert-scale questions. This instrument quantified maternal skills, healthcare decisions, and program engagement, with a pilot test conducted with 10 mothers to refine clarity and validity (Saunders *et al*., 2019).

3.6 Data Analysis
Data analysis involved cleaning in Excel and statistical analysis in STATA. Descriptive statistics summarized socio-demographic variables, while inferential statistics (chi-square tests, regression analysis) examined relationships between maternal skills and child outcomes, controlling for confounders like income and education (Pallant, 2020).

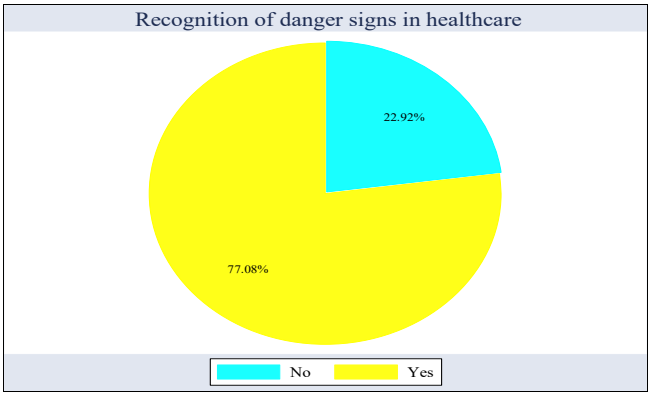
3.7 Triangulation
Methodological triangulation enhanced validity by cross-verifying quantitative findings with secondary data from clinic records and existing literature on maternal education. This approach mitigated potential self-report bias and strengthened study conclusions (Carter *et al*., 2014).

3.8 Limitations
The study acknowledged limitations including the cross-sectional design's constraint on causal inference, potential limited generalizability from the small sample size, and possible self-report bias in questionnaire responses. These limitations were addressed through contextualization with existing literature and recommendations for future longitudinal research (Ponto, 2015).

3.9 Ethical Considerations
Full ethical approval was obtained from relevant institutional review boards, with participants providing written informed consent. Strict protocols ensured anonymity, confidentiality, and secure data storage, with findings disseminated to stakeholders to inform policy development (Resnik, 2020).

4. Findings and Results
4.1 Characteristics of Respondents (Bio Data)
The socio-demographic profile of the 50 respondents reveals a population facing significant economic challenges but with moderate educational attainment. The majority of mothers were married (42%) and had at least a primary education (68%), with 36% having reached secondary level. However, economic vulnerability was prevalent, with 32% unemployed, 32% informally employed, and over half (52%) earning less than K1,000 per month. Households were generally large, with 20% having four or six members, placing considerable strain on resources. Most households (76%) had at least one child under two years old, and while the majority (78%) had not experienced an under-two child loss, a significant minority (22%) had, with the Pearson chi-square test ($\chi^2 = 1.404$, $p = 0.496$) indicating no significant association between recent and past child loss. The population was predominantly Christian (74%). This profile outlines a context where foundational maternal potential may be constrained by pervasive poverty and large household sizes.

4.2 Fundamental skills among mothers influence healthcare decision-making during the first 1000 days of childhood in Kanyama Constituency



Source: Primary Data, 2025

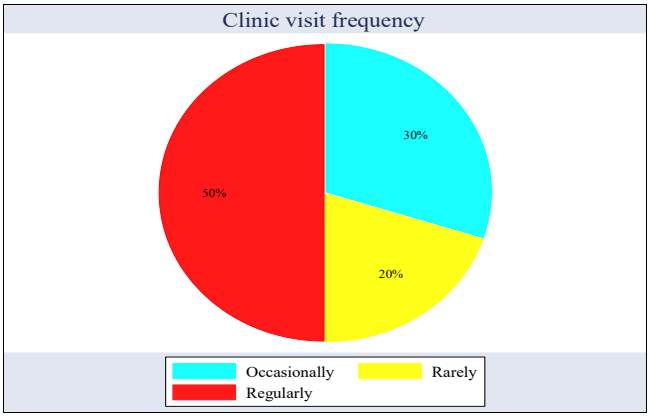
Fig 1: Recognition of danger signs in healthcare

The results indicate that a majority of respondents (77.1%) were able to recognize danger signs in healthcare, while 22.9% could not, suggesting that most participants possessed fundamental skills essential for timely and informed healthcare decision-making.

Table 1: Identified danger signs

Listed Signs	Freq.	Percent
Convulsions	3	8.11%
Diarrhea with dehydration	5	13.51%
Difficulty breathing	6	16.22 %
High fever	8	21.62%
Loss of consciousness	3	8.11 %
Persistent vomiting	4	10.81%
Refusal to feed	3	8.11 %
Severe cough	5	13.51%
Total	**37**	**100.0%**

Among the respondents who could identify danger signs, 21.6% recognized high fever, 16.2% identified difficulty breathing, 13.5% each mentioned diarrhea with dehydration and severe cough, 10.8% noted persistent vomiting, and 8.1% each cited convulsions, loss of consciousness, and refusal to feed, indicating varied awareness of critical health conditions that require prompt attention.



Source: Primary Data, 2025

Fig 2: Clinic visit frequency

Half of the respondents (50%) reported regular clinic attendance, indicating substantial engagement with healthcare services. However, the other half exhibited inconsistent patterns 30% visiting occasionally and 20% rarely suggesting that significant barriers or irregular health-seeking behaviors persist, potentially compromising timely medical care.

Table 2: Identified several barriers affecting clinic visits

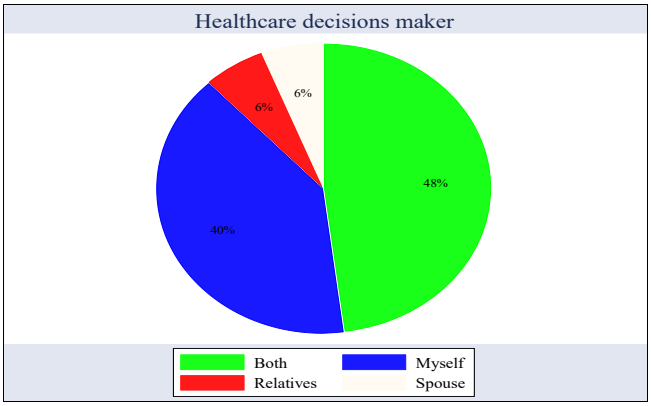
Clinic Barrier	Freq.	Percent	Cum.
Cost	8	16.00	16.00
Distance	17	34.00	50.00
No time	10	20.00	70.00
None	8	16.00	86.00
Not informed	7	14.00	100.00
Total	50	100.00	

The study found that clinic visits were mainly hindered by distance (34%), lack of time (20%), and cost (16%). Additionally, 14% were unaware of available healthcare services, while 16% faced no barriers. Overall, access to healthcare is limited by logistical and informational challenges, impacting timely medical care and outcomes.

Table 3: Hygiene practices among respondents

Hygiene Practice	Freq.	Percent(%)
Bathing	32	60.0
Diaper disposal	34	68.0
Handwashing	15	30.0
Sterilizing	20	40.0
Total responses	50	100

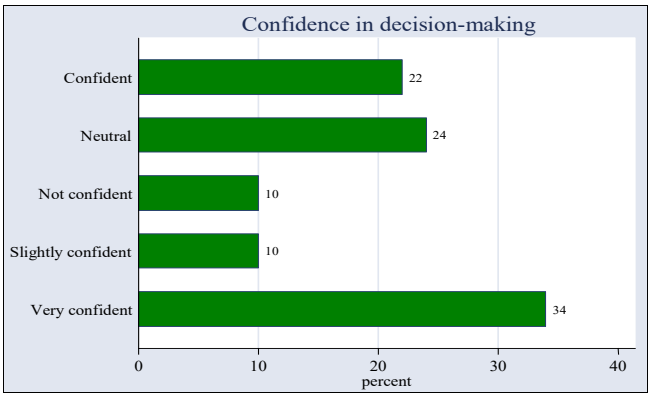
The study revealed that while most respondents practiced proper diaper disposal (68%) and regular bathing (60%), fewer engaged in sterilizing items (40%) and handwashing (30%). This suggests that although basic hygiene habits are common, crucial practices like handwashing and sterilization need greater emphasis through health education.



Source: Primary Data, 2025

Fig 3: Healthcare decisions maker

The findings show that healthcare decisions were mostly made jointly by partners (48%) or individually (40%), while only 6% relied on relatives and another 6% on their spouse. This indicates that decision-making is primarily shared or independent, emphasizing the role of personal and joint agency in health choices.



Source: Primary Data, 2025

Fig 4: Confidence in healthcare decision-making

The study found that most respondents had moderate to high confidence in making healthcare decisions, with 34% very confident and 22% confident. However, 24% were neutral, and 20% expressed low confidence, indicating that while many feel capable, some may need additional support or guidance to strengthen their decision-making skills.

Table 4: Helpful Fundamental Skills

Helpful Fundamental Skill	Freq.	Percent	Cum.
Breastfeeding	12	24.00	24.00
Food preparation	12	24.00	48.00
Hygiene	10	20.00	68.00
Recognizing illness	16	32.00	100.00
Total	50	100.00	

The findings show that recognizing illness (32%) was viewed as the most important skill for healthcare decision-making, followed by breastfeeding and food preparation (24% each), and hygiene (20%). This indicates that respondents place the highest value on identifying illness as key to timely and effective health decisions.

Table 5: Best Maternal Skill

Best Maternal Skill	Freq.	Percent
Exclusive breastfeeding	7	14.00
Growth monitoring	6	12.00
Preparing nutritious meals	7	14.00
Proper hygiene	6	12.00
Proper immunization follow-up	6	12.00
Recognizing illness early	6	12.00
Safe food handling	6	12.00
Timely clinic visits	6	12.00
Total	50	100.00

The study found that respondents viewed a mix of nutritional, preventive, and hygiene-related skills as key to child health. Exclusive breastfeeding and preparing nutritious meals were each cited by 14%, while growth monitoring, proper hygiene, immunization follow-up, early illness recognition, safe food handling, and timely clinic visits were each mentioned by 12%. This highlights the importance of a balanced approach to nutrition, prevention, and hygiene in promoting child well-being.

4.3 The Impact of maternal fundamental skills on child nutrition outcomes during the first 1000 days of childhood in Kanyama Constituency

Table 6: Months Exclusive Breast Feeding

Months Exclusive Breastfeeding	Freq.	Percent	Cum.
3-5 months	21	42.00	42.00
6 months	14	28.00	70.00
<3 months	6	12.00	82.00
Did not breastfeed	9	18.00	100.00
Total	50	100.00	

The study found that while 42% of respondents breastfed for 3–5 months and 28% for the recommended 6 months, 12% did so for less than 3 months, and 18% did not breastfeed at all. This suggests that although many mothers practice exclusive breastfeeding, few follow the full six-month recommendation, potentially affecting child nutrition and growth.

Source: Primary Data, 2025

Fig 5: Age at which children were introduced to solid foods

The findings show that children were introduced to solid foods at varying ages: 24% at 7 months, 22% at 9 months, 20% at 5 months, 14% at 6 months, 12% at 8 months, and 8% at 4 months. This variation suggests inconsistent adherence to recommended weaning practices, which could influence children's nutritional status and overall development.

Table 7: Daily meal frequency

Meals Per Day	Freq.	Percent	Cum.
2	8	16.00	16.00
3	12	24.00	40.00
4	13	26.00	66.00
5	11	22.00	88.00
6	6	12.00	100.00
Total	50	100.00	

The study found that most children were fed three to five times a day 26% received four meals, 24% three meals, and 22% five meals while 16% had two meals and 12% six meals daily. This indicates generally adequate feeding frequency, though some children may still fall short of optimal nutritional intake.

Table 8: Dietary diversity

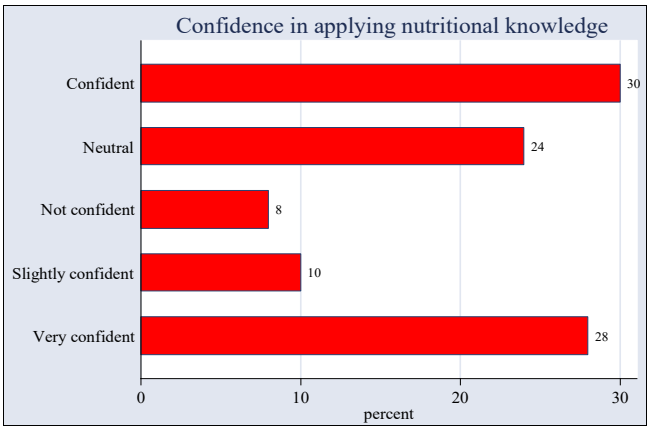
Food Groups Per Day	Freq.	Percent	Cum.
1-2	15	30.00	30.00
3-4	24	48.00	78.00
5 or more	11	22.00	100.00
Total	50	100.00	

The results on dietary diversity show that 48% of children consumed 3-4 different food groups per day, 30% consumed 1-2 groups, and 22% consumed five or more groups. This indicates that while nearly half of the children have moderately diverse diets, a significant proportion still receive limited dietary variety, which may affect their overall nutritional status and growth.

Table 9: Nutrition Challenge Faced

Nutrition Challenge	Freq.	Percent
Child refuses to eat	6	15.38
Cost of nutritious food	7	17.95
Cultural food preferences	6	15.38
Lack of access to fresh produce	6	15.38
Lack of variety in diet	7	17.95
Limited time to prepare	7	17.95
Total	**39**	**100.00**

Among the 39 respondents who had knowledge of nutrition during illness, the main challenges they faced in applying this knowledge included limited time to prepare meals (17.95%), the cost of nutritious food (17.95%), lack of variety in the diet (17.95%), child refusal to eat (15.38%), cultural food preferences (15.38%), and lack of access to fresh produce (15.38%). These findings indicate that practical, economic, and cultural barriers can hinder the effective application of nutritional knowledge, potentially affecting child health outcomes.



Source: Primary Data, 2025

Fig 6: Confidence in applying nutritional knowledge

The study revealed that most caregivers had moderate to high confidence in applying nutritional knowledge, with 28% very confident and 30% confident. However, 24% were neutral, while 18% showed low confidence, suggesting that while many feel capable, some may need further support to enhance their nutritional management skills.

Table 10: Topics Wants to Learn More

Topics Want To Learn	Freq.	Percent	Cum.
Feeding during illness	18	36.00	36.00
Meal planning	13	26.00	62.00
Nutritious meals	19	38.00	100.00
Total	50	100.00	

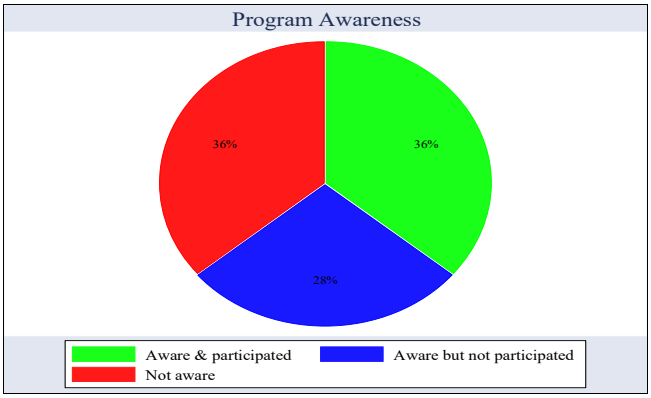
The study found that respondents were keen to learn about nutrition, with 38% interested in preparing nutritious meals, 36% in feeding during illness, and 26% in meal planning for young children. This highlights a strong demand for practical and illness-focused nutritional education to enhance child health outcomes.

Table 4.16: Correlation Analysis Mother's healthcare decision confidence vs. nutritional knowledge confidence

	confid~g	confid~n
confidence~g	1.0000	
confidence~n	0.5962 0.0000	1.0000

The analysis shows a strong, statistically significant positive correlation ($r = 0.5962$, $p < 0.05$) between mothers' confidence in healthcare decision-making and their confidence in applying nutritional knowledge. This indicates that mothers who are more confident in making healthcare decisions are also more likely to effectively apply nutritional practices. Strengthening mothers' overall decision-making skills through targeted training could therefore enhance their confidence in child nutrition, supporting better health outcomes during the first 1000 days of life.

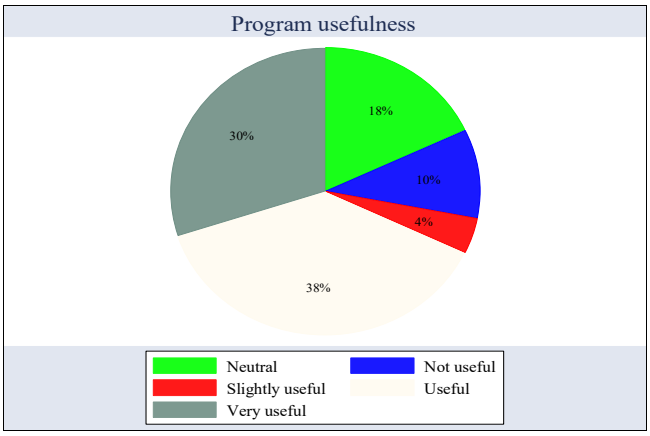
4.4 The effectiveness of maternal education programs in reducing child mortality in Kanyama Constituency of Lusaka District



Source: Primary Data, 2025

Fig 4.14: Program Awareness

The study found that 36% of respondents had participated in maternal education programs, 36% were unaware of them, and 28% were aware but had not participated. This indicates moderate participation, with a notable portion of caregivers lacking awareness or engagement, highlighting the need for improved outreach and accessibility to maximize program impact.



Source: Primary Data, 2025

Fig 4.16: Program usefulness

The findings show that most respondents viewed maternal education programs positively, with 38% finding them useful and 30% very useful, while 18% were neutral and 14% perceived them as less or not useful. This suggests that the programs are generally effective in providing valuable knowledge and skills, though a small proportion remain unconvinced of their impact.

Table 4.14: Main topics

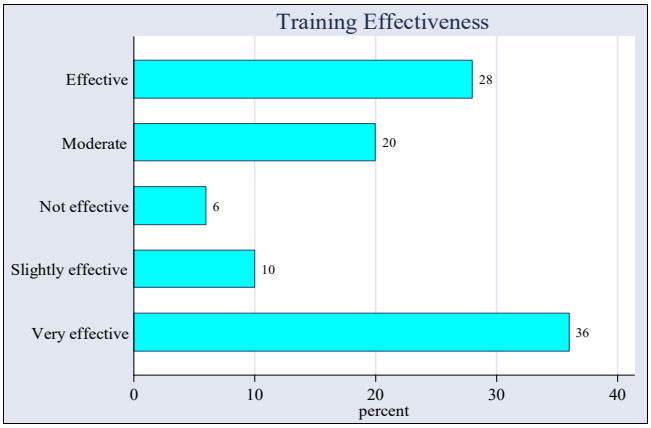
Topic	Freq.	Percent
Breastfeeding	12	24.0
Growth monitoring	18	36.0
Hygiene	11	22.0
Illness management	24	48.0
Nutrition	19	38.0

The summary shows that respondents prioritized illness management (48%), nutrition (38%), and growth monitoring (36%), while breastfeeding (24%) and hygiene (22%) received less emphasis. This indicates a stronger focus on illness and nutrition over other maternal and child health practices.

Table 4.16: Type of Change Made

Chang Type	Freq.	Percent
Better handwashing practices	1	2.56
Better waste disposal practices	1	2.56
Changed feeding practices	8	20.51
Growth monitoring at home	3	7.69
Improved hygiene	9	23.08
Increased breastfeeding duration	1	2.56
Introduced balanced diet for child	1	2.56
Introduced better weaning practices	1	2.56
Introduced more diverse meals	1	2.56
Introduced more fruits into meals	1	2.56
Introduced more vegetables into meals	1	2.56
More regular clinic visits	6	15.38
Proper food storage practices	1	2.56
Started boiling drinking water	2	5.13
Started growth monitoring at home	2	5.13
Total	**39**	**100.0**

Among the 39 respondents who reported changes in childcare after training, the most common improvements were better hygiene (23.08%), changes in feeding practices (20.51%), and more regular clinic visits (15.38%). Other adjustments included growth monitoring at home (7.69%), boiling drinking water (5.13%), and proper food storage (2.56%), along with enhanced nutrition through balanced diets, diverse meals, and increased fruit and vegetable intake (2.56% each). Additional improvements were noted in breastfeeding duration, weaning practices, handwashing, and waste disposal. These findings indicate that the training prompted holistic improvements in both health and nutrition practices among participants.



Source: Primary Data, 2025

Fig 4.17: Training Effectiveness

The findings show that 36% of respondents rated the training as very effective and 28% as effective, while 20% viewed it as moderately effective, and 16% rated it as slightly or not effective. Overall, 64% perceived the training positively, indicating it was generally well-received and considered beneficial for improving maternal and childcare practices.

Table 4.17: Suggestions to improve the maternal education programs

Suggestions |	Freq.	%
Better nutrition lessons	8	16%
Conduct sessions in local language	7	14%
Free training sessions	6	12%
Include fathers in training	5	10%
Increase frequency of training	6	16%
More home visits	7	14%
Offer childcare during sessions	5	10%
Provide free educational materials	6	12.00

Participants suggested several improvements for maternal education programs. The most common were enhancing nutrition lessons and increasing training frequency (16% each), followed by conducting sessions in the local language and providing more home visits (14% each). Other recommendations included offering free training and educational materials (12% each), involving fathers, and providing childcare during sessions (10% each). These responses highlight a desire for more accessible, inclusive, and practical programs that better meet community needs.

4.5 Discussion of Research Findings

The findings provide strong empirical confirmation that fundamental maternal skills are a decisive determinant of child health in Kanyama, yet their effectiveness is profoundly mediated by structural and economic barriers. The high rate of danger-sign recognition (77.1%) aligns with studies in Sub-Saharan Africa that identify this skill as crucial for reducing under-five mortality, demonstrating that

most mothers in Kanyama possess the foundational knowledge for prompt medical intervention. However, the translation of this knowledge into consistent practice is hampered by systemic obstacles. The fact that only 50% of mothers attended clinics regularly, with distance, cost, and time cited as primary barriers, echoes findings by Kapata *et al*. (2022) [28] on how healthcare accessibility in Lusaka's urban poor often outweighs maternal knowledge. Furthermore, the discrepancy between high adherence to practices like diaper disposal (68%) and critically low handwashing rates (30%) reveals a gap between selective knowledge application and comprehensive preventive behavior, underscoring the urgent need for practical, skill-based training that moves beyond awareness to instill consistent life-saving practices.

The impact of maternal skills on child nutrition reveals a complex interaction between individual capability and socioeconomic constraints. The low adherence to WHO-recommended exclusive breastfeeding (28%) is particularly alarming and mirrors national trends identified in ZDHS data. The significant association between formal employment and shorter breastfeeding duration ($\chi^2 = 21.40$, $p = 0.011$) empirically validates the need for supportive workplace policies, a finding consistent with global literature on employment-related breastfeeding barriers. Similarly, the strong link between household income and dietary diversity ($\chi^2 = 20.12$, $p = 0.003$) provides quantitative confirmation that poverty remains a fundamental driver of malnutrition, limiting mothers' ability to apply nutritional knowledge even when possessed. This finding resonates with studies across Sub-Saharan Africa that demonstrate how economic empowerment must accompany nutrition education. The strong positive correlation between healthcare decision-making confidence and nutritional confidence ($r = 0.5962$, $p = 0.0000$) offers compelling evidence for holistic intervention approaches, suggesting that empowering mothers in one domain strengthens capabilities across multiple caregiving dimensions.

The evaluation of maternal education programs presents a paradox of proven effectiveness constrained by implementation gaps. While the data delivers compelling evidence of impact with 78% of participants changing childcare practices and significant improvements in hygiene, feeding, and healthcare utilization the structural failure in outreach is stark. That 36% of mothers remained completely unaware of programs highlights a critical disconnect between service provision and community access, a finding consistent with challenges documented in Zambian health systems. The community-driven recommendations for local language sessions, male involvement, and childcare support during training expose the cultural and logistical limitations of current program designs. These findings align with global best practices in maternal education that emphasize contextual adaptation and household-level engagement. Ultimately, the study confirms that while maternal education is empirically powerful, its transformative potential for reducing child mortality in Kanyama will only be realized through deeper, more inclusive outreach and program designs that actively dismantle the structural and cultural barriers limiting participation and impact.

5. Conclusion

This study empirically confirms that maternal background characteristics particularly education and income are decisive determinants of child survival, with poverty directly constraining dietary diversity ($\chi^2 = 20.12$, $p = 0.003$) and healthcare access. While fundamental maternal skills in healthcare decision-making, nutrition, and hygiene prove central to reducing mortality, significant gaps persist between knowledge and practice, as evidenced by low exclusive breastfeeding rates (28%) and inconsistent handwashing (30%). Crucially, the strong positive correlation between healthcare and nutritional confidence ($r = 0.5962$, $p = 0.0000$) demonstrates the synergistic potential of maternal empowerment. Although maternal education programs demonstrate transformative impact with 78% of participants adopting improved practices their effectiveness is severely constrained by structural failures in outreach and accessibility, leaving 36% of mothers entirely unaware of services. Thus, while maternal capabilities are foundational to child survival, their full potential will only be realized through integrated approaches that combine skill-building with systemic reforms addressing poverty, workplace policies, and culturally adapted program delivery.

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