EFFECTIVENESS OF POST-DISCHARGE EDUCATIONAL INTERVENTION IN IMPROVING RECOMMENDED POSTNATAL PRACTICES AMONG PRIMIPARAS MOTHERS IN INFORMAL SETTLEMENTS IN NAIROBI COUNTY, KENYA.

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DECLARATION

This thesis is my original work and has not been presented for a degree at any other university.

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DEDICATION

This thesis is dedicated to my late mother Lilian Wanjiru, who perceived and developed my potential, suffered greatly to ensure that I received a basic education, and instilled in me the importance of perseverance. Mami, rest in peace. My husband Kamau Mwangi deserves special recognition for his wisdom and unwavering support. My gratitude to our three children, Wangari, Munyugi, and Wanjiru, for their support and affection during the time I was conducting this study. My appreciation goes to my siblings and friends, who have supported me when I considered giving up. Finally, I offer posthumous gratitude to my late, loving father-in-love for pushing me to break the ceiling and accomplish what he only desired.

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LIST OF ABBREVIATIONS /ACRONYMS

ANC	Antenatal Care
CHP	Community Health Promoter
DSA	Demographic Surveillance Area
EBF	Exclusively Breast Feeding
IEC	Information Education and Communication
KDHS	Kenya Demographic Health Survey
LAM	Lactational Amenorrhea Method
LMICs	Low- and Middle-Income Countries
LOHS	Length of Hospital Stay
MDSs	Maternal Danger Signs
MNCH	Maternal Newborn and Child Health
MMR	Maternal Mortality Ratio
MPSE	Maternal Parental Self-Efficacy
MSE	Maternal Self-Efficacy
NDSs	Neonatal Danger Signs
NUHDSS	Nairobi Urban Health and Demographic Surveillance System
NMR	Neonatal Mortality Rate
PMP S-E	Perceived Maternal Parenting Self-Efficacy
PNC	Postnatal Care
PNE	Postnatal Education
PNPs	Postnatal Practices
PPD	Postpartum Depression
PSE	Parenting Self-Efficacy

RA	Research Assistant
RMNCAH	Reproductive, Maternal, Neonatal, Child and Adolescent Health
SDGs	Sustainable Development Goals
SPSS	Statistical Package for Social Sciences
STI	Sexually Transmitted Infections
UN & IGME	United Nations Inter-Agency Group for Child Mortality Estimation
UN MMEIG	United Nations Maternal Mortality Estimation Inter-Agency Group
WHO	World Health Organization

DEFINITION OF OPERATIONAL TERMS

Dyad - Mother and baby together as a pair.

Early postnatal period - Denotes the period from 2nd to 7th day after birth (WHO,2013).

Hospital-based postnatal Care / pre-discharge care – Care and monitoring of the mother and the baby in the health facility after delivery and before discharge. (WHO, 2022).

Follow-up care: Further post-discharge care or contact by a health professional.

Recommended Postnatal practices: Care-giving activities meant to preserve and nurture the mother and the baby during the postnatal period. WHO stipulates recommended evidence-based postnatal practices for maternal and newborn well-being (WHO,2013). This study included health-seeking for maternal and neonatal danger signs, baby care and self-care practices, and postnatal visits at 2 and 6 weeks for the mother and the baby.

Maternal Self-efficacy/ Perceived maternal self-efficacy: "The belief a mother holds about her level of perceived knowledge, confidence and capabilities to organize and execute a set of tasks related to parenting a child" (Botha et al.,2020).

Management of danger signs: Correct identification and appropriate health seeking.

Multimodality intervention: Use of diverse Information Education and Communication (IEC) modalities such as print, audiovisual, internet, phone etc. in health education.

Neonatal mortality rate: "The probability of dying within the first month of life per 1,000 live births", (WHO,2022).

Postnatal care: Care given to mother and baby immediately after birth up to 6 weeks (WHO,2022).

Postnatal education: Structured intervention where parents are provided with education or information related to caring for their newborn (and the mother) (Bryanton et al, 2013 as cited by Subramanian,2020)

Postnatal period: “the period beginning immediately after the birth of the baby and extending up to six weeks (42 days)”, (WHO, 2022).

Postpartum and postnatal: “The term postpartum and postnatal are often used interchangeably but sometimes separately where "postpartum" pertains to the mother and "postnatal" to the baby, though postnatal is mostly used for both”, (WHO, 2013b).

Primipara: an individual that has borne only one offspring (Merriam-Webster dictionary)

Self-Efficacy: In Bandura’s classic definition, “self-efficacy is a person’s belief in their ability to perform a particular behavior successfully”(Bandura, 1994).

Uncomplicated vaginal delivery: “Unassisted vaginal birth of baby and placenta, with no maternal complications”, (WHO, 2013b)

ABSTRACT

Reducing Maternal Mortality Ratio (MMR) and Neonatal Mortality Rate (NMR) are critical Sustainable Development Goals. Informal settlements in Nairobi exhibit an inordinate MMR of 706 per 100,000 live births. While KDHS 2022 estimates NMR in Nairobi as 20 per 1000 live births, most occur among the poorer. Prioritizing disadvantaged populations contributing to higher mortalities is recommended. Postnatal care (PNC) is a high-impact intervention but it is neglected, compromising Postnatal Education (PNE)- a key evidence-based strategy to improve postnatal practices (PNPs). Early discharge for normal deliveries curtails pre-discharge PNE compromising knowledge and Maternal Self-Efficacy (MSE) leading to poor practices. This is accentuated among low-income primiparas who therefore require follow-up. This study examined the influence of a multi-modal follow-up PNE intervention which comprised of a home visit by CHP within the first week, educational videos and wall hanging, self-affirmation pamphlets, telephone access to a CHP and SMS reminders on MSE, adoption of recommended PNPs among primiparas in Nairobi slums. The effect of MSE on PNPs and its mediating role was established. It was a quasi-experimental study in *Viwandani* and *Kwa Reuben* (Experimental site) and *Korogocho* and *Huruma* (control site) where convenience sampling was applied to recruit 118 primiparas per group with normal singleton delivery discharged early from facilities serving the slums. Interviewer-administered questionnaires were used for quantitative data, FGD guide for qualitative data and Perceived Maternal Parental Self-Efficacy (PMPS-E) questionnaire for MSE. Data were analyzed using IBM SPSS version 20.0 and descriptive statistics, t-tests, Chi-square, Mann-Whitney test, and multiple linear and logistic regressions were derived. Thematic analysis was used for qualitative data. The MSE was a mediating variable while the adoption of recommended PNPs was a composite dependent variable comprised of health-seeking for maternal danger signs, newborn danger signs, self-care, baby care practices, and utilization of PNC contacts. The intervention was a positive predictor of MSE (β=0.59, p=0.00), composite PNPs (β=0.26, p=0.00), self-care practices (β=0.39,p=0.00), and mothers' two weeks PNC contact (OR=4.64, p=0.00, 95% CI=1.9-11.2) components. It had no significant influence ($p<0.05$) on health seeking for mothers and newborns after experiencing danger signs, baby care practices, two weeks PNC contact for the newborn, and six weeks PNC contact for the dyad. The PMSE score influenced composite PNPs (β=0.15, p=0.02) and self-care practices (β=0.38, p=0.00), two weeks PNC visit for both the baby (OR 1.06, p= 0.00, 95% CI=1.02-1.11) and mother (OR=1.03, p=0.01, 95% CI 1.0-1.06). MSE was inversely related to seeking emergency health care after an MDS (β=-0.19, p=0.04), but had no influence ($p>0.05$) on health seeking after NDS, baby care practice, and attendance of six weeks PNC visit for the dyad. MSE was not a mediator between the intervention and PNPs. Primiparas appreciated the diverse follow-up support, especially CHP home visits. Post-discharge PNE intervention can improve MSE and PNPs among low-income primiparas and thus Ministry of Health can incorporate it into routine PNC. Applying multipronged PNE delivery methods is effective. Further research is needed on primiparas who have complicated births thus stay longer in hospital and on the cost-effectiveness of scale-up.

CHAPTER ONE: INTRODUCTION

1.1 Background

Maternal and neonatal mortality remains a global health concern. There are disproportionately higher deaths in Sub-Saharan Africa (SSA) accounting for 70% of all maternal deaths with a Maternal Mortality Rate (MMR) of 545 deaths per 100,000 live births compared to 211 globally, 351 in East Africa, and 4 in New Zealand (WHO, 2023). Similarly, the neonatal period presents the highest risk of death, accounting for 47% of all under-five deaths in 2020 with SSA having the highest Neonatal Mortality Rate (NMR) globally at 27 deaths per 1,000 live births compared to 17 globally, and 3 in Europe. Kenya's NMR is 21 deaths per 1000 live births and MMR 342 deaths per 100,000 live births (MOH, 2020).

Rapid urbanization in the urban settings of most LMICs has resulted in increased proportions of city dwellers living in overcrowded slums who continue to register poor health outcomes(Atahigwa et al., 2020). Slums in Nairobi exhibit disproportional rates with an estimated MMR of 706 per 100,000 live births (Ziraba, 2009 as cited by Atahigwa et al., 2020). Though NMR in Nairobi is lower than the national rate at 20 per 1000 live births (KNBS, 2023), research indicates that the rates are higher in poorer communities such as slums and among primiparas (Mwangi & Yego, 2023). Most of these deaths are from preventable causes (UN & IGME, 2021) and indicate higher morbidities(UNFPA, 2020).

The postnatal period beginning from birth of the baby up to six weeks, is a critical phase when most mortalities and morbidities occur yet strategies designed to reduce them and recommended by the WHO remain underutilized (Finlayson et al., 2020; WHO, 2022).

Postnatal care (PNC) is defined as "care given to both the mother and the newborn from birth to reduce the incidence of complications and deaths and to promote the health of the mother and baby" (MoH, 2016, p. 1). It is a fundamental strategy towards the attainment of SDG 3.1 which aims to reduce MMR ratio to less than 70 per 100,000 live births and 3.2 to reduce NMR to 12 per 1,000 live births yet it unfortunately remains neglected(WHO, 2022). Having been christened the poor cousin or *Cinderella* of midwifery for decades (Yelland, 2010), PNC is still underserved and inadequately considered compared to antenatal and intrapartum, especially in SSA(Finlayson et al., 2020; Owen et al., 2020).

World Health Organization (WHO) four PNC contacts where mothers, newborns and families interact with the health providers with the first contact being the continued care within the first 24 hours, 10-14 days, 4-6 weeks and 4-6 months after birth(WHO, 2022). In Kenya, the visits are scheduled; within 48 hours, 1-2 weeks, 4-6 weeks, and 4-6 months(MoH, 2016). Although KDHS 2022 shows great improvements where 78% of women and 80% of newborns receive PNC within 48 hours, current data on utilization of post-discharge contacts nationally remains scanty with concerns for underutilization hence missed opportunities for early diagnosis and timely management of common maternal and infant conditions (KNBS, 2023; MoH, 2016)

Postnatal Education (PNE) is a vital component of PNC (WHO, 2013b) meant to "provide information and education about the normal physiological changes associated with childbirth, breastfeeding, and parenting, aimed at giving women and their families the confidence to manage the care of their baby"(MoH, 2016, p. 1).

It is key to the adoption of evidence-based practices and maternal confidence in transitioning to the home setting (Nan et al., 2020; Subramanian et al., 2020). However, there exist concerns about the adequacy of pre-discharge PNE given the short hospital stays, time-constrained staff, failure to follow guidelines, and the large amount of information expected to be relayed during this short window (Dol, Kohi, et al., 2019; Nan et al., 2020; Smith et al., 2022).

It is against this backdrop that women consistently complain of unmet need for information to facilitate a smooth transition to motherhood (Finlayson et al., 2020; Nan et al., 2020). These challenges are more accentuated among primiparas who show considerable knowledge gaps on discharge (Beraki et al., 2020) and whose inexperience predisposes them to a stressful transition into motherhood compounded by a lack of continuity of care following early discharge (Nan et al., 2020; Shorey et al., 2019). Low-income mothers are mostly affected (Lee et al., 2018). Unfortunately, the provision of hospital-based post-discharge PNE too is curtailed by challenges such as limited knowledge of the essence of PNC services, insufficient staffing, inadequate infrastructure, and sub-optimal scheduling of PNC contacts (Al Hadi et al., 2023; Konje et al., 2021). This leaves the mothers exposed to the risks of low maternal knowledge throughout the postnatal period.

Against the backdrop of poor socioeconomic challenges, studies identify poor maternal knowledge as a critical hindrance to maternal and newborn outcomes including health-seeking in slum communities in LMIC (Magunda et al., 2023; J. E. Park et al., 2022).

In urban slums in Kampala, limited knowledge of post-discharge PNC affected attendance of PNC visits with mothers returning only for immunization or emergencies where primiparas were worse off owing to their lack of previous experience (Magunda et al., 2023). Similarly, suboptimal maternal knowledge hindered breastfeeding practices in Nairobi urban slums, especially among young mothers (Kimani-Murage et al., 2020; Nyamasege et al., 2021). Moreover, low maternal knowledge leads to poor parental adjustment, poor postnatal practices (PNPs), and low Maternal Self-Efficacy (MSE) adversely affecting postnatal outcomes (Shorey et al., 2019).

Defined as "beliefs a mother holds about her capabilities to organize and execute tasks related to parenting a child", MSE "is associated with numerous maternal and child health outcomes" (Montigny and Lacharité, 2005, as cited by Botha et.al., 2020). It is an essential skill for the transition to motherhood and the promotion of healthy behavior as it mediates maternal knowledge and parenting practices (Lee et al., 2018). Primiparity, poor social support, low income, and poor living conditions -conditions prevalent in slums- are notably associated with low MSE(Zheng et al., 2018). This calls for interventions targeting low-income primiparas beyond the hospital door considering their dissatisfaction with early discharge and little or absent post-discharge follow-up (Nan et al., 2020).

Adequate maternal knowledge improves the uptake of evidence-based practices, mitigating adverse outcomes. For instance, educating women to recognize postnatal danger signs and seek urgent medical help saves lives (AWHONN, 2019).

Additionally, timely PNE improves evidence-based newborn care practices and timely healthcare seeking for illnesses, saving newborn lives (Subramanian et al., 2020). Evidence favors multimodality educational programs that combine experience with the practice of skills, question, and answer, mHealth technology, individualized sessions with key content presented via diverse formats such as videos, activities, and up-to-date printed self-reading resources (Dol, Campbell-Yeo, et al., 2019; McKee et al., 2019). Also, key is incorporating early postpartum home visits by health professionals or in LMIC, Community Health Promoters (CHPs) (WHO, 2022; Yonemoto et al., 2021). Interventions that cover multiple practices are recommended in LMIC for their cost-effectiveness (Subramanian et al., 2020).

Though various home-based follow-up interventions have proved effective in enhancing primiparas outcomes (Nan et al., 2020; Tiruneh et al., 2019), there is a dearth of information on their effect on low-income primiparas' outcomes in Kenya. This study seeks to determine the effect of multi-modal follow-up educational intervention on MSE and key WHO-recommended PNPs defined in this study as the evidence-based care activities meant to preserve and nurture the mother and the baby during the postnatal period. This study included health-seeking for danger signs, self-care, baby care, and PNC contacts for the newborn and the mother, among primiparas in Nairobi's informal settlements.

1.2 Problem statement

It is disconcerting that MMR - a key indicator for healthcare quality and socioeconomic development -(Candeira & dos Santos F, 2021), is more than twofold in Nairobi's informal settlements at 706 per 100 000 live births, compared to 342 nationally (Atahigwa et al., 2020; MOH, 2020). On the other hand, NMR in Nairobi is lower than the national rate at 20 per 1000 live births (KNBS, 2023). However, the rates are disproportionately higher in the poorer communities such as slums and among primiparas (Mwangi & Yego, 2023). Most of these cases occur during the postnatal period, yet PNC is neglected in the MNCH continuum (WHO, 2022).

Though PNE, a vital aim of PNC is a proven and cost-effective strategy for reducing MMR, NMR, and associated morbidities (Subramanian et al., 2020; WHO, 2013b), it remains largely compromised leading to low knowledge, especially among first-time mothers in low-resource settings (Beraki et al., 2020). Transition into motherhood is stressful for primiparas as they experience many challenges due to lack of experience yet there is no continuity of professional care after being discharged early leading to poor parental adjustment, hence negative parental practices and outcomes and low MSE, especially among the low-income (Nan et al., 2020; Shorey et al., 2019).

Current services are insufficient in meeting the needs of primiparas (Nan et al., 2020) and this may impact negatively on the prevention of MMR, NMR, and associated morbidity. Though follow-up self-efficacy theory-based PNE interventions are impactful for primiparas and neonatal outcomes in LMICs; and WHO recommends postnatal home visits among other strategies, (Dol, Campbell-Yeo, et al., 2019; WHO, 2013b), its effect on MSE and PNPs among primiparas living in Nairobi slums has not been documented.

1.3 Justification

Goals 3.1 and 3.2 of Sustainable Development Goals (SDGs), are to reduce the global MMR to less than 70 per 100,000 live births, and NMR to 12 per 1,000 live births (United Nations, 2015). Kenya is off track with an MMR of 342 and NMR of 21(MOH, 2020). Kenya's Reproductive, Maternal, Neonatal, Child and Adolescent Health (RMNCAH), investment framework calls for prioritization of populations with higher mortalities highlighting preventive PNC as a high-impact intervention (MoH Kenya, 2016).

Nairobi County hosts the largest slums in Kenya with 2 million(Ren et al., 2020) exhibiting higher MMR(Atahigwa et al., 2020). Impoverished communities such as slums exhibit poorer neonatal outcomes (Mwangi & Yego, 2023). Though the mortalities are preventable with evidence-based practices, the opportunities remain underutilized (WHO, 2022). Though PNE is a crucial investment to enhance the use of preventive evidence-based practices, it is currently suboptimal in LMIC. Although 2022 *WHO guidelines for positive postpartum experience* recommends that "the skills and confidence of the woman for newborn and self-care be assessed before discharge"(WHO, 2022), it does not prescribe MSE enhancement post-discharge.

There are compelling grounds that multi-pronged, self-efficacy theory-based, home-based follow-up PNE interventions are effective in supplementing routine PNC in LMIC, improve uptake of evidence-based PNPs and are helpful to the low-income primiparas (Gandomi et al., 2022; Subramanian et al., 2020; Tiruneh et al., 2019; Wang et al., 2021). Documenting its effect on the adoption of the recommended PNPs among low-income primiparas living in Nairobi slums informs supportive PNC programming for better postnatal outcomes.

1.4 Research questions

1. What is the effect of follow-up post-discharge postnatal education intervention on maternal self-efficacy among low-income primiparas in Nairobi's informal settlements?
2. What is the effect of a follow-up post-discharge postnatal education intervention on the adoption of recommended postnatal practices among low-income primiparas in Nairobi's informal settlements?
3. What is the relationship between maternal self-efficacy and the adoption of recommended postnatal practices among low-income primiparas in Nairobi's informal settlements?
4. Does maternal self-efficacy mediate the relationship between follow-up post-discharge postnatal education intervention and adoption of recommended postnatal practices among low-income primiparas in Nairobi's informal settlements?

1.5 Null hypotheses

1. H_0: Follow-up post-discharge postnatal education intervention does not influence maternal self-efficacy among low-income primiparas in Nairobi's informal settlements.
2. H_0: Follow-up post-discharge postnatal education intervention does not influence the adoption of recommended postnatal practices among low-income primiparas in Nairobi's informal settlements.

1.6 Objectives

General objective: To evaluate the effectiveness of post-discharge educational intervention on the adoption of recommended postnatal practices among low-income primiparas in informal settlements in Nairobi County, Kenya.

Specific objectives

1. To determine the effect of follow-up post-discharge postnatal education intervention on maternal self-efficacy among low-income primiparas in Nairobi's informal settlements.
2. To evaluate the effect of a post-discharge postnatal education intervention on the adoption of recommended postnatal practices among low-income primiparas in Nairobi's informal settlements.
3. To determine the relationship between maternal self-efficacy and the adoption of recommended postnatal practices among low-income primiparas in Nairobi's informal settlements.
4. To assess if maternal self-efficacy mediated the relationship between follow-up post-discharge postnatal education intervention and the adoption of recommended postnatal practices among low-income primiparas in Nairobi's informal settlements.

1.7 Significance of the study findings

Data on follow-up post-discharge PNE is useful for the Ministry of Health (MoH) and other PNC service providers in developing innovative postnatal follow-up strategies. The intervention worked and can be adopted into routine care, thus improving MSE and adoption of evidence-based PNPs, eventually supporting SDGs 3.1 and 3.2 in reducing maternal and neonatal morbidity and mortality.

The findings provide a valuable reference to the scientific community for it contributes to the body of knowledge highlighting areas for further research.

1.8 Limitations of study

The rarity of primiparas with normal delivery, healthy singleton discharged within 48 hours, and living in these areas reduced the target population, increasing the study duration. Being a quasi-experimental study with non-random allocation may have potentially led to non-equivalent groups. This was minimized by adjusting for relevant independent variables in the regression analysis. Being that the postnatal period is time-limited did not allow a pre-test. This study being a post-test only made it difficult to establish if the groups might have started differently with regard to MSE and the adoption of PNPs.

Though it was hard to fully address this, having a control group and a resultant large effect size Hedges'g 1.5 points to a substantial practical significance of the intervention. The observed outcomes were self-reported and thus may have been subject to desirability bias. The respondents were however assured of confidentiality and urged to be honest while the RAs were cautioned to be neutral by not showing approval or disapproval of responses. Composite scoring of PNPs may have led to a loss of information from individual items, thus each component had to be re-analyzed separately increasing data volume. The onset of COVID-19 and resultant logistical issues such as social distancing and limited access led to a prolonged period of study and more finances to procure masks and sanitizers for participants, CHPs, and RAs. There may have been other unknown limitations occasioned by the onset of COVID-19 that could not be minimized thus affecting generalizability.

1.9 Delimitation of study

The study targeted primiparas residing in Viwandani, Kwa Reuben and Korogocho, Huruma slums who delivered term, uncomplicated singleton birth with healthy babies being discharged from selected maternity units within 48 hours of delivery, who could be visited by a CHP and could be contacted by phone post-discharge.

1.10 Theoretical framework

The study applied Bandura's Social Cognitive Theory (SCT) which has been used extensively in health promotion given its emphasis on the individual and the environment in relation to behavior. According to Bandura (2004, P.143),

> "SCT specifies a core set of determinants, the mechanism through which they work, and the optimal ways of translating such knowledge into effective health practices. The core determinants include knowledge of health risks and benefits of different health practices, perceived SE that one can exercise control over one's health habits, the outcome of the expected costs and benefits for different health habits, personal health goals as well as concrete plans and strategies for realizing them, and the perceived facilitators and social and structural impediments to the changes they seek" (Bandura, 2004).

The theory states that environmental and observational factors will influence learning and take on an "agent-like perspective to change" with Bandura describing an agent as "someone who intentionally influences one's functioning and life circumstances". The construct of reciprocal determinism means that a person can be both an agent (producer) for change and a responder to change (product) (Bandura, 2001).

In this study, the respondent was both an agent of change by participatory learning and a producer of change by adopting health-promoting behavior. Reciprocal determinism implies that cognitive processes and the environment have an impact on an individual's behavior as shown in Figure 1.1.

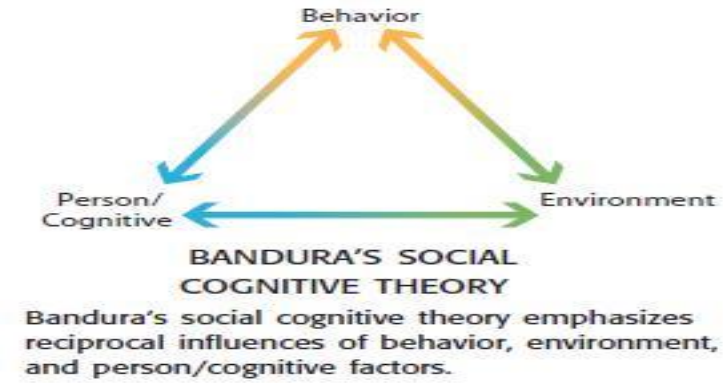


Figure 1.1: Bandura Social Cognitive Theory (Bandura, 1977)

Bandura, 2001 further asserts that environmental changes, such as the use of role models and reinforcements can enhance healthier behavior. Based on this, this intervention sought to enhance the primiparas' maternal knowledge and MSE (cognitive responder), subsequently improving the selected PNPs (agent of change) using CHPs, significant others, videos as role models, and print material and telephone follow-ups as reinforcements. Social cognitive theory considers the social-structural environment in which individuals perform the behavior (Bandura, 2001) that facilitate or inhibit their behavior. The social-cultural environmental factors likely to influence outcomes of the study are; socio-demographic variables such as age, level of education, occupation, family income, and marital status as well as birthing facility factors: type (Private, Public, FBO), workload ratio, and length of hospital stay (LOHS); and perceived satisfaction (Botha et al., 2020; Wang et al., 2021). They were measured and controlled for.

Self-efficacy is an especially crucial determinant of health behavior and is of interest in this study. MSE mediates between maternal knowledge and maternal practices, thus an important determinant of postnatal outcomes among primiparas (Liyana Amin et al., 2018). MSE was an important factor in determining the respondent's behavior which is the third component of Banduras' triad. The envisaged behavior and the dependent variable in this study was the adoption of recommended PNPs composed of management of danger signs for the dyad, adoption of recommended self-care practices; baby care practices; and attendance of PNC contact at two weeks and at six weeks. They were all derived from the key teaching components stipulated in the *WHO recommendations on PNC of the mother and newborn, 2013* (WHO, 2013) and adopted in the *Healthy mothers & newborns: guidelines for PNC* (MoH, 2016) *and WHO counseling for maternal and newborn health* (WHO, 2013a).

1.11 Philosophical lens of the study: Positivism

This study took a positivism philosophical lens. "Positivism relies on the hypotheticodeductive method to verify a priori hypotheses where functional relationships can be derived between causal and explanatory factors (independent variables) and outcomes (dependent variables)"(Ponterontto, 2005 as cited by Park et al., 2020). Under a positivist paradigm, scientific inquiry is primarily concerned with explanation and prediction thus taking a theory-verification approach.(Y. S. Park et al., 2020). This study sought to verify the effect of PNE intervention on MSE and selected recommended PNPs controlling for socio-demographic and facility-based independent variables fitting well in the positivism paradigm.

1.12 Conceptual framework pathways

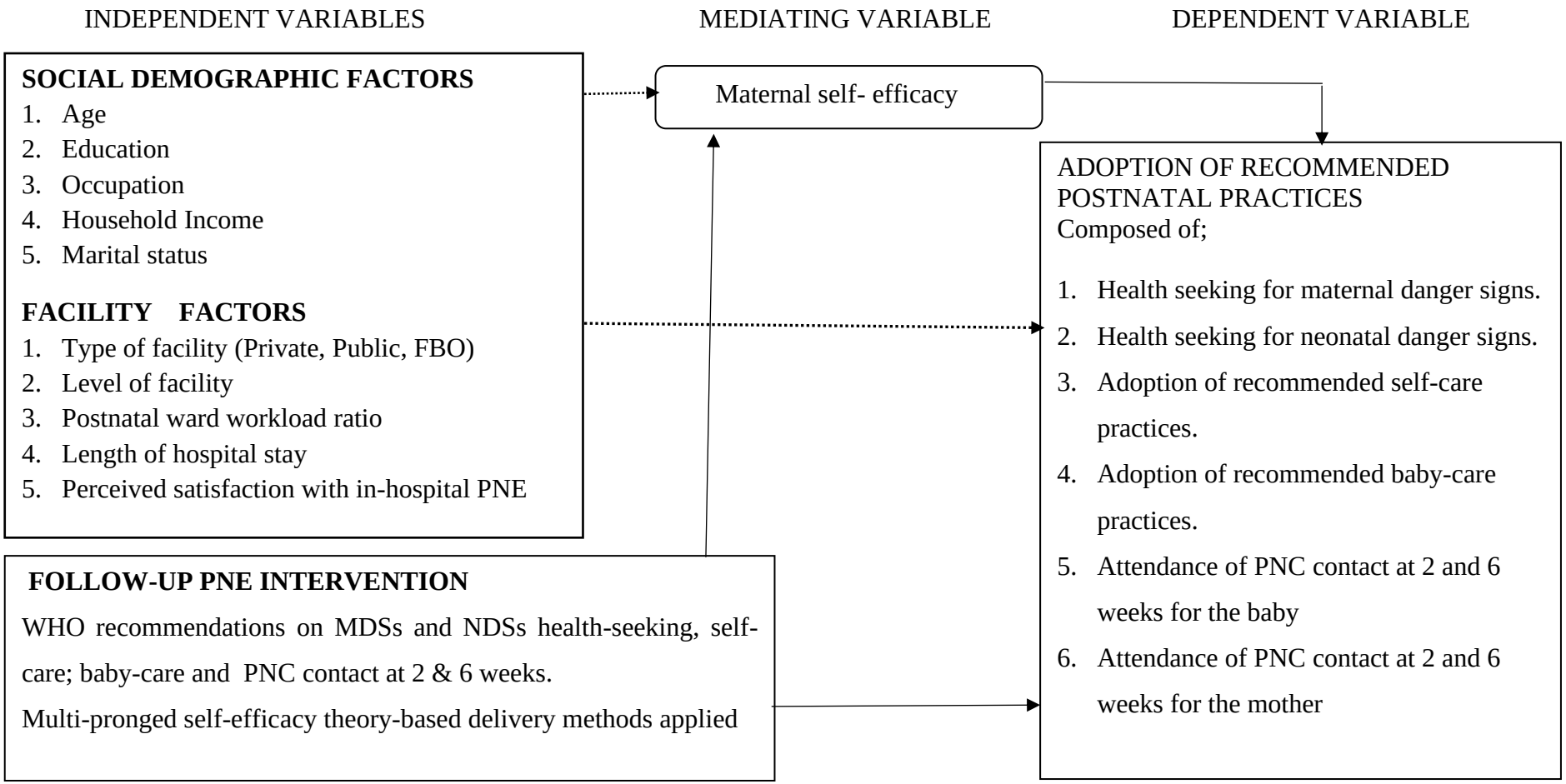
a) Social-demographic and facility factors potentially affect both MSE and adoption of recommended PNPs (dotted lines fig1.2) which was controlled for in the regression analysis.

b) The intervention potentially affects the MSE

c) The intervention potentially affects the adoption of PNPs

d) Maternal Self-Efficacy potentially mediates the effect of the intervention on the adoption of PNPs

1.13 Conceptual framework



Adapted from (Lee et al., 2018) and literature reviewed.

Figure 1.2: Conceptual Framework

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents existing literature focusing on the burden of maternal and neonatal mortality globally, regionally, nationally, and in informal settlements in Nairobi, the neglect of PNC and PNE strategies in improving MSE and evidence-based PNPs, both of which are crucial to reducing MMR, NMR and associated morbidity. It provides the rationale for focusing on primiparas living in informal settlements. Further, the chapter provides the rationale for PNE interventions and states the WHO recommendations.

2.2 Burden of maternal and neonatal mortality

The United Nations Maternal Mortality Estimation Inter-Agency Group (UN-MMEIG) has raised a concern about the stagnation of progress toward global MMR between 2016-2020 (WHO, 2023), posing a threat to the progress towards the SDG 3.1 target. Approximately 800 women die daily globally from preventable causes related to pregnancy and childbirth with SSA bearing 70% of deaths with a high MMR of 545 deaths per 100,000 live births versus 223 globally, 351 in East Africa and four in New Zealand, with rural and poorer urban communities having higher rates (WHO, 2023).

Similarly, the neonatal period presents the greatest risk of death with a neonate born in SSA being 11 times more likely to die than one born in a high-income country at 27 deaths per 1,000 live births, versus 17 globally and three in Europe. Progress in reducing neonatal mortality has been slower with 47% and 51% of all under-five deaths being neonatal globally and in Kenya respectively (KNBS, 2023; UN & IGME, 2021). Kenya has recorded minimal improvements in NMR from 22 to 21 per 1000 live births according to KDHS 2014 and KDHS 2022 (KNBS, 2016, 2023).

The maternal and neonatal mortalities are still unacceptably high and are indicative of higher morbidities where for example, for each maternal death - 20-30 women suffer serious morbidities (UNFPA, 2020). Many of these mortalities arise from preventable causes and they mostly occur during the postnatal period making it a critical time for women, newborns, partners, parents, caregivers, and families (WHO, 2022).

2.3 Postnatal Care: A key strategy for maternal and newborn health

Postnatal care is the "care given to both the mother and the newborn from birth to reduce the incidence of complications and deaths as well as to promote the health of the mother and baby"(MoH, 2016, p. 1). Optimum uptake of PNC services is a pivotal strategy towards the attainment of SDG 3.1 which aims to reduce MMR ratio to less than 70 per 100,000 live births and 3.2 to reduce NMR to 12 per 1,000 live births (MoH, 2016).

According to Kenya *Healthy Mothers and Newborns guidelines for postnatal care*, *2016*.

> "Postnatal care should be woman-centered to enable the women to participate in informed decision-making regarding their own care and the care of their baby. Providing information and education relating to the normal physiological changes associated with childbirth, breastfeeding, and parenting is a key component of postnatal care that is aimed at giving women and their families the confidence to manage the care of their baby"(MoH, 2016, p. 3)

World Health Organization recommends at least four postnatal contacts for all mothers and newborns where the word "contact" implies an active interaction between women, newborns, parents and caregivers, and care providers aimed at providing respectful, individualized, person-centered care (WHO, 2022, p. 195).

The first contact is continuous care within the first 24 hours, 10-14 days, 4-6 weeks and 4-6 months after birth. In Kenya, the visits are scheduled; within 48 hours, 1-2 weeks, 4-6 weeks, and 4-6 months (MoH, 2016). Utilization of PNC contacts provides health providers with an opportunity to identify post-delivery problems early and to offer treatment promptly (MoH, 2016). According to KDHS 2022, 78% of women nationally and 81% in Nairobi versus 80% of newborns nationally and 90.6% in Nairobi received PNC within 48 hrs(KNBS, 2023). Unfortunately, subsequent follow-up postnatal contacts are underutilized and there is lack of national data on the same (MoH, 2016). This points to a gap given that the mother becomes the primary caregiver thus a need for continuity of care.

2.4 Neglect of postnatal care.

During this postnatal period, the burden of maternal and neonatal mortality and morbidity remains unacceptably high, yet opportunities to increase maternal well-being and to support nurturing newborn care have not been fully utilized" (WHO, 2022). Postnatal care is an under-resourced and underserved aspect of maternity care (Finlayson et al., 2020). The provision of PNC in low-resource contexts is defined by constraints like inadequate healthcare facilities, under-trained personnel, lack of standard guidelines, inconsistent information, high workload, short LOHS, and lack of continuity of care (Kamau & Mwanza, 2018; Konje et al., 2021; Sakala & Chirwa, 2019).

Facility births in Kenya increased from 61% in 2014 to 82% in 2022 (KNBS, 2016, 2023) An increase in facility births is a window of opportunity for the provision of essential neonatal (and postpartum) care. However, due to early discharge, few stay in the facility for the critical 24 hours (WHO, 2018).

It is against this backdrop that a study in SSA showed that access to facility-based childbirth is not a guarantee to good-quality postpartum care (Benova et al., 2019). Though women value practical advice, reassurance, information, and support from health professionals for the achievement of positive motherhood, these needs are often unmet (Finlayson et al., 2020). This is more accentuated among primiparas who face challenges in transitioning to motherhood, thus consistently complaining of unmet needs exacerbated by short LOHS that limit contact time for their equipping and absence of continuity of care from HWs through the postnatal period (Nan et al., 2020; Shorey et al., 2019) .

Consequently, women value continuity of care beyond hospital walls because it improves the experience of care (WHO, 2022). In low-income settings lacking well-functioning midwifery programmes, WHO recommends routine PNC contacts be complemented by phone-based follow-up and digitally targeted communication. Further, a home visit by well-trained community health workers is recommended for further care, supporting transition home and linking mothers to health facilities(WHO, 2022)

2.5 Rationale for and gaps in postnatal education

Existing literature shows that women value PNE for their spouses, families, and themselves for parental confidence, and hence WHO guidelines recommend “information provision, educational interventions and counseling to prepare women, parents and caregivers for discharge from the health facility after birth to improve maternal and newborn health outcomes and to facilitate the transition to the home” (WHO, 2022).

Considered “an important investment to improve families’ use of evidence-based newborn care (and indeed PNC) practices”, PNE is a sound lifesaving strategy as an integral part of PNC to equip (mothers) and families with information and skills for better postnatal outcomes (Subramanian et al., 2020). For instance, the use of evidence-based newborn care practices by families and prompt healthcare seeking for illness potentially saves newborn lives (Subramanian et al., 2020). Similarly, increasing the number of women who can identify potentially fatal post-discharge danger signs and teaching them when to seek immediate medical attention may help prevent many maternal deaths (AWHONN, 2019).

However, there are concerns over the adequacy of predischarge PNE given the short LOHS and the extensive information expected to be imparted to mothers during this small window of time (Botha et al., 2020; Shorey et al., 2018). In India for example, less than half of respondents received PNE on newborn care pre-discharge (Subramanian et al., 2020). In Ethiopia, mothers had less than half of the PNC knowledge on discharge, with lower scores among low-income, less educated, primiparas (Beraki et al., 2020). Similarly in Tanzania, mothers got some education pre-discharge and despite nurses’ willingness to teach, there were obstacles to receiving adequate PNE, thus inadequate information (Dol, Kohi, et al., 2019).

A study in Nairobi - Kenya showed that 57.2% of the mothers were discharged with inadequate postnatal knowledge (Kamau & Mwanza, 2018), while one in Kakamega affirmed that knowledge of PNC is poor among postnatal mothers (Kiragu et al., 2021). Subsequently, mothers especially primiparas have expressed dissatisfaction with early discharge and the absence of subsequent follow-up (Nan et al., 2020) .

Considering the forgoing unmet maternal informational needs (Mulauzi & Daka, 2018), a critical gap is presented that if not addressed has the potential to sabotage the efforts towards better maternal and newborn health. Research shows that postpartum mothers need information on self-care, baby care, sexual relationships, and emotional support (Mulauzi & Daka, 2018). Low maternal knowledge has been associated with poor postnatal outcomes such as poor breastfeeding practices (’Hamze et al., 2019), underutilization of postnatal contacts(Kiragu et al., 2021) , low MSE, poor parental adjustment, suboptimal newborn care, low maternal satisfaction (Shorey et al., 2019) and poor health seeking for postnatal danger signs(Roney et al., 2021).

Against this backdrop, several studies underscore the significance of providing follow-up care to primiparas given their lack of experience leading to poor parental adjustment and low MSE hence, negative postnatal outcomes (Koochakzai et al., 2018; Liyana Amin et al., 2018; Shorey et al., 2019; Subramanian et al., 2020).

2.6 Maternal Self-Efficacy: The critical element in the transition to motherhood

According to Bandura's theory, “Perceived SE is defined as people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. It is not a fixed personality trait, but a dynamic process modified by task and situational demands as well as changing individual factors” (Bandura, 1977). A subcategory of SE, “MSE is the belief a mother holds about her capabilities to organize and execute a set of tasks related to parenting a child” and “it is associated with numerous maternal and child health outcomes”, Montigny, Lacharite and Goto, (as cited by Zheng et al; 2018 p.152).

Coleman and Karraket 1998 (as cited by Liyana et al.,2018, pg. 5) posit that MSE mediates between knowledge and behavior, hence knowledge may only influence behavioral change when one is confident of their capabilities (Lee et al., 2018).

In the PP, MSE is positively related to health-promoting lifestyle, EBF, health-seeking behaviors, health care provider interactions, parental competence, effective parenting, optimal pediatric health outcomes, functional status of postpartum mothers, parenting satisfaction and inversely related to maternal stress and depression (Botha et al., 2020; Fathi et al., 2018; Khadijeh Hajimiri et al., 2018; Vieira et al., 2018). The opposite is true for low MSE. Unfortunately, primiparas have low MSE, hence a need for interventions to empower them and boost their self-efficacy (Liyana Amin et al., 2018).

According to Bandura, SE can be modified through efficacy-enhancing interventions based on the "four influential factors that construct and enhance SE" (Bandura, 1998). First, is the mastery (previous) experiences which is the most effective means of enhancing efficacy. A strong belief in one's efficacy is fortified by self-success while failures weaken it. Second is vicarious experiences where social models facilitate this where witnessing alike people succeed raises observers' beliefs that they can succeed too. Third, social persuasion, "People who are persuaded verbally that they possess the capabilities to master given activities are likely to mobilize greater effort and sustain it than if they harbor self-doubts" (Bandura, 1977). The fourth way is physiological feedback (emotional arousal): "Positive mood enhances perceived SE, negative mood diminishes it, thus reducing people's stress reactions and altering their negative emotions and misinterpretations of their physical states enhances it" (Bandura, 1977).

In line with this, WHO recommends that prior to discharging a woman, HWs assess their skills and confidence to care for herself and the newborn (WHO, 2022). However, there is no recommendation on how to enhance the same if found low, beyond the hospital door. Thus, a need to enhance MK and MSE especially among primiparas after the discharge.

2.7 Focus on low-income primiparas living in Nairobi's informal settlements.

Nairobi County is home to the largest slums in Kenya with 60% to 70% of its population residing in slums (Wamukoya et al., 2020). The slums MMR is almost double Kenya's average at 706 per 100 000 live births, far greater than the national rate of 342, thus a need to enhance health information to improve women's knowledge on the benefits of maternal health care services (Atahigwa et al., 2020).

The need to enhance MSE as a crucial conduit to the adoption on healthy postnatal behaviors is underemphasized. Yet, maternal competency is lowest in both primiparity and low-income where in addition to informational needs, primiparas living in multiple deprivations experience wider variety and complex needs (Buchanan & Jardine, 2020; Wang et al., 2021). Indeed, factors associated with low MSE such as inadequate social support, lower education, low health literacy, unskilled occupation, low maternal age, poor income, depression, poor living conditions and sanitation (Wang et al., 2021; Zheng et al., 2018); are more prevalent in slums. Though there is paucity of literature on the effect of short hospital stay on MSE, studies have shown that early discharge affects predischarge PNE delivery thus less knowledge (Botha et al., 2020) and low maternal knowledge is associated with low MSE(Lee et al., 2018).

Fortunately, MSE is modifiable and evidence shows that education interventions remain the best interventions for the empowerment of parents and the enhancement of their own SE (Liyana Amin et al., 2018). Unfortunately, there is a paucity of studies on self-efficacy theory-based postnatal educational interventions focusing on low-income primiparas discharged early and living in informal settlements in Kenya. This study prioritized the enhancement of primiparas maternal knowledge and MSE to improve the adoption of WHO-recommended PNPs.

2.8 Prioritizing educational intervention for improvement of postnatal outcomes

Maternal health information has a significant influence on the health of the mother and the newborn(Mulauzi & Daka, 2018). A study exploring the information needs of socioeconomically disadvantaged young first-time mothers specifically found that they have multiple, diverse new informational needs that are interwoven in more complex issues such as poverty making mothers feel overwhelmed and unsure of what to do predisposing them to anxiety and stress (Buchanan & Jardine, 2020). A synthesis of NUHDSS data in Nairobi slums (*Korogocho* and *Viwadani*) found gaps in maternal knowledge, calling for improvement in health information and education that can improve it for better service utilization before and after pregnancy (Atahigwa et al., 2020) and indeed for better maternal and newborn outcomes.

A survey of literature on the maternal informational needs postpartum, shows they include infections, umbilical cord care, infant feeding, mother recovery, infant care, self-care (nutrition, weight reduction, and hygiene), sexual relationships, family care, emotional support, physical rest, and sleep (Mulauzi & Daka, 2018).

There is a clarion call on the contextualization of PNE in terms of optimal timing, personnel involved, optimal content and delivery methods in different cultures, and how to measure outcomes (Dol, Campbell-Yeo, et al., 2019; Tiruneh et al., 2019; Yonemoto et al., 2021). Although WHO has recommendations for key PNE content, (WHO, 2013b) there is a need to contextualize its delivery to reach disadvantaged populations. Subramanian et al., contend that "there is a compelling rationale to invest in postnatal care programmes that address existing programmatic gaps by initiating education at the critical moment of predischarge in-facilities, using a multipronged education approach to reach whole families about multiple newborn (and maternal) care practices, and reinforcing messages post-discharge" (Subramanian et al., 2020, pg5). This calls for testing innovative and impactful interventions on different sub-populations.

One such intervention is home visits by health workers or CHPs. Research shows that short LOHS after childbirth, with no home visits and community-level follow-up may result in complications (Benova et al., 2019). Indeed, home visits have the potential to reduce maternal morbidity and mortality in LMICs especially when coverage is higher (Cockcroft et al., 2019). However, a recent Cochrane review contends that the evidence is uncertain due to inconsistent results in different settings (Yonemoto et al., 2021), calling for more research on the effectiveness of different modalities in different settings such as informal settlements. Nonetheless, WHO recommends at least one home visit by a health worker or CHP for low-resource settings during the early postnatal period. Indeed home-based counseling intervention through CHPs was shown to augment maternal knowledge on baby care practices such as better nutrition, hygienic practices, and adequate feeding practices thus reducing stunting prevalence in Nairobi slums (Nyamasege et al., 2021)

WHO also recommends the use of mobile phone-based linkage of mothers to local health facilities as it improves mothers' and infants' health outcomes (WHO, 2013b). In Nairobi slums, a recent study demonstrated an improvement in knowledge level and care-seeking in the PNC period for both mothers and infants after an SMS intervention in Mathare and Kawangware slums. (Ochieng' et al., 2024). Health care-seeking, problem-solving, delayed baby bathing, breastfeeding, cord care, and thermal care are among the PNC skills that can be enhanced through mHealth communication (Mbuthia et al., 2019) demonstrating that mHealth is a valuable component of postnatal interventions.

A review of parenting programs by experts has favored multimodality programs that incorporate face-to-face, individualized sessions that include practice of skill and a time for question and answer where a facilitator provides feedback, with the core content presented in diverse formats such as video, activities, up-to-date printed self-help resources (McKee et al., 2019; Subramanian et al., 2020).

In terms of MSE enhancement, the mode of delivery of education interventions should be based on the four influencers of self-efficacy discussed earlier which has been shown to be cost-effective and effective in other maternal outcomes such as reducing pregnancy anxiety and enhancing pregnancy outcomes (Gandomi et al., 2022). In another study, self-efficacy theory-based postnatal home-based education was found to improve primiparous women's perceived self-efficacy in neonatal care(Koochakzai et al., 2018). In line with the adage *"*Tell me and I forget, teach me and I may remember, involve me and I learn*"* by Benjamin Franklin, the delivery should be participative.

Social support for postpartum mothers is also an important consideration. According to Bandura (1997)'s theory, “social support may influence MSE through processes involving vicarious experience, verbal persuasion, and physiological and emotional status” (Zheng et al., 2018). Though formal support by a health worker visit is valuable, informal support such as participation of family in postnatal and infant care is crucial in the transition to motherhood Xiao et al., 2020).

In terms of outcome variables, the *CDC Maternal Health Epidemiology, module 2 of 2003* expresses the need to begin using outcome and process indicators by researchers and policymakers to measure the progress in reducing maternal mortality, considering the limitations in the measurement of impact indicators such as MMR and SMM. In page 26, it reasoned that “outcome and process indicators are generally easier to measure than impact indicators” (Patel et al., 2003). In light of this, this study focused on recommended by WHO for teaching or counseling for maternal and neonatal health.

2.9 Recommended postnatal education components

Based on extensive best practice research, WHO recommends that all mothers ought to be informed about the “physiological process of recovery after birth, common health problems” to look out for self and baby, “with advice to report any health concerns to a health care professional” (WHO, 2013b). This study prioritized the following objectives as listed in *WHO recommendations on PNC of the mother and newborn, 2013*.

2.9.1 Identification and health-seeking for maternal danger signs

WHO recommendations on PNC states that “all women be given information on the physiological process of recovery after birth, and that some health problems are common, with advice to report any health concerns to a health care professional, in particular signs and symptoms of: Post Partum Hemorrhage (PPH), Pre-eclampsia/eclampsia, Puerperal sepsis or infection, Thromboembolism, Breast problems, Obstetric fistula, and Puerperal psychosis. The counselling guide describes the symptoms and signs (WHO, 2013b, p. 5). (See Appendix 6)

2.9.2 Identification and health-seeking for newborn danger signs

The mother should be encouraged to seek health care early if they identify any of these danger signs in-between PNC visits: difficulty in breathing or in-drawing, grunting or wheezing, looking blue around the mouth; fits; poor temperature control; bleeding; failure to feed, poor sucking; yellow palms, eyes, and soles; and diarrhea(WHO, 2013b, p. 3).

2.9.3 Adoption of recommended self-care practices

Orem 2001 as cited by Funda 2018,page 210, defines self-care ability as "the activities initiated and done by individuals in order to maintain their lives, health and well-being".

She states that “Mothers need self-care ability on an adequate level to sustain the health of both them and their babies” (Özdemir et al., 2018). WHO recommends these self-care practices: having someone nearby to offer support for the first 24 hours; maternal nutrition-intake of a greater amount, frequent, healthier balanced diet, enough water in the context of local practices, personal hygiene, hand washing, puerperium care, adequate rest and sleep-avoiding hard physical labor; frequent emptying of the bladder; pelvic floor exercise.

Simple body exercises: keeping off sexual intercourse until the perineal heals. Condom use for protection against STIs; birth spacing and uptake of family planning method including the Lactational Amenorrhea Method (LAM); favorable atmosphere at home to enhance newborn health and mother's recovery including warmth, good ventilation, and hygiene; and the dyad sleeping under an insecticide-treated bed net in areas that are malaria endemic.

2.9.4 Adoption of recommended baby care practices

Based on the available evidence, WHO recommends that "all babies be exclusively breastfed from birth until six months" and recommends that "all mothers be counseled and provided with support for EBF" (WHO, 2013,p.3). In addition, WHO recommends mothers be counseled on simple baby practices that can improve their health including keeping the baby warm – by adding one to two layers above that of an adult and putting a hat if cold; clean, dry cord for newborns through "daily chlorhexidine for the first seven days in high-risk areas and avoidance of harmful substances"; keeping the baby clean,- - ensuring the room is warm when unclothing the baby; taking the baby for immunization at six weeks; and laying the baby on his/her back or on the side (WHO,2013b).

2.9.5 Attendance of postnatal care contact at two weeks and six weeks

WHO recommends at least three additional PNC contacts after the initial one before discharge for all mothers and newborns, on the third day (48-72 hours), between 7–14 days after birth, and six weeks after birth . It also recommends home visit for PNC in the first week (WHO,2013b). The CHP will visit the mothers in the study arm and thus only 2nd and 6th week contact will be measured.

2.9.6 Maternal Self-Efficacy

The key focus here is to enhance the primiparas' sense of her motherhood capability and ability to translate knowledge into practice. MSE was measured by use of the “Perceived Maternal Parental Self-efficacy (PMPS-E)” questionnaire; a 20-question scale by Ingram et al (Ingram J, Blair PS, Powell JE, 2016) , developed to assess MPSE in mothers.

2.10 Synopsis of gaps in literature

It is disconcerting that MMR, NMR, and associated morbidities remain unacceptably high in Kenya. The rates are unequally higher in low-resource settings such as urban slums. A significant proportion occurs during the PP, yet PNC is neglected on the MNCH continuum. Maternal health information is pivotal for the health of the mother and the newborn. The need to equip mothers with knowledge for the role of caregiving post-discharge makes PNE, a pivotal strategy in mitigating adverse postnatal outcomes. In fact, PNE is seen as crucial in ensuring that mothers adopt evidence-based maternal and neonatal practices. With increase in skilled delivery, the hospital stay is seen as a window of opportunity for teaching.

However, due to the constrained nature of in-hospital PNC especially the ever-reducing post-birth stay, teaching opportunity is reduced, hence mothers who deliver healthy babies normally are discharged within 24 hours or less with inadequate knowledge of the key postnatal elements such as danger signs management, baby care, self-care and PNC visits, low MSE and no or little follow-up, predisposing them to poor practices and subsequently poor postnatal outcomes. This gap is accentuated among the low-income primiparas who lack experience and have low MSE, needing follow-up through multimodal educational interventions, yet no published study was found on Nairobi informal settlements.

CHAPTER THREE: MATERIALS AND METHODS

3.1 Introduction

This chapter outlines the research design, the variables of the study, the location of the study, and the study population. The sampling techniques, sample size determination, construction of research instruments, and their pre-testing, validity, and reliability are also described. It also describes the intervention and the arms of the study, data collection techniques, data analysis, and logistical and ethical considerations of the study.

3.2 Research design

A quasi-experimental study using a post-test-only design with Viwandani and Kwa Reuben as the experimental cluster and Korogocho and Huruma as the control cluster. Quasi-experiments helped to mitigate the difficulties of randomizing while reducing the risk of contamination. Quantitative and qualitative research methods were applied.

3.3 Variables of the study

a) Independent variables:

Social demographic factors: including age, occupation, level of education, household income, and marital status; **Facility factors** comprised of the type of facility (private, public, FBO), level of the facility, Postnatal ward workload ratio, and perceived satisfaction with pre-discharge PNE and **the experimental independent variable** which was the follow-up PNE intervention.

b) The mediating variable was the maternal self-efficacy.

c) The dependent variable was the adoption of recommended PNPs**: -** a composite variable made up of health-seeking for maternal danger signs (MDSs), health-seeking for neonatal danger signs (NDSs), adoption of recommended self-care practices,

adoption of recommended baby care practices; and attendance of PNC contact at two and six weeks for both the mother and the baby. The principle of proportionality was applied to calculate the fraction score for each of the eight components per respondent which was averaged into a composite mean score per respondent.

3.4 Location of the study: Nairobi informal settlements

There are 14 big slums in Nairobi; Kibera, Mathare, Mukuru Kwa Reuben, Kawangware, Dandora, (Kangemi) estate, Soweto, Korogocho, Huruma, Estate , Tassia Sinai, Pumwani Majengo, kwa Njenga , Viwandani and Kiambiu(Ren et al., 2020). Among them, APHRC established two demographic surveillance areas (DSA) namely Korogocho and Viwandani for NUHDSS in 2002 to provide specific data for slums and their special needs. The slums are located 12 km from Nairobi Central Business District (CBD) and are 7 km apart but with comparable socioeconomic levels. Korogocho is Nairobi's fourth largest informal settlement and is located on the banks of Nairobi and Gitathuru rivers, covering an area of about 0.97 km. Viwandani is situated on the bank of Ngong River and is located about 7 km from the CBD. The residents are mostly highly mobile youth who are job seekers or are employed in the neighboring industrial area (Beguy et al., 2015). According to 2018 NUHDSS unpublished data, Women of Reproductive Age (WRA) are 26,435 with Korogocho having 10,460 and Viwandani 15,975 (APHRC, 2018). Applying the exclusion criteria based on KDHS 2014: 6.8% of WRA in Nairobi are pregnant at any one time thus 1,797; (16.2%) have a first child, 291; (89%) have facility birth, 259; (79%) have normal birth thus 204, while 87% are discharged in 48 hours thus 178 which is quite small. To increase this population the study area was increased by adding adjacent slums where Huruma was added to Korogocho and Kwa Reuben was added to Viwandani.

3.5 Target population

Postpartum primiparas living in Nairobi informal settlement, who had uncomplicated singleton birth at term with healthy babies and were discharged within 48 hours of birth.

3.6 Study population

Postpartum primiparas living in Viwandani and Mukuru Reuben or Korogocho and Huruma slums, who had term, uncomplicated singleton birth, with healthy babies being discharged within 48 hours of birth from selected maternity units serving the slums. The study population was derived from 2019 deliveries in the facilities serving these slums. Since the study was estimated to take 6 months, half of the 2019 deliveries were used to estimate the study population by applying the KDHS 2014 16% estimate of first-time births with 79% having normal delivery, with 87% of normal births discharged within 48 hours.

Table 3.1: Derivation of the study population

CLUSTER A				CLUSTER B			
Viwandani facilities	**Estimated deliveries 2019**	**Mukuru kwa Reuben facilities**	**Estimated deliveries 2019**	**Korogocho facilities**	**Estimated deliveries 2019**	**Huruma Facilities**	**Estimated deliveries 2019**
Cana	1218	Reuben health center	941	Korogocho health center	287	Jumuia	23
Medilink	306			Mwangaza Tumaini	631	Huruma nursing	1406
Olive link	726			Provide International	140	Uzima white	135
						Radiant	140
Total	2250		941		1058		1704
Grand total cluster A			**3191**	**Grand total cluster B**			**2762**

Cluster A study population estimate		**Cluster B study population estimate**	
6 months estimate	1596		1381
Primiparas estimation (16%, KDHS 2014)	255		221
Normal births 79%, (KDHS 2014)	202		175
Discharged within 48 hours 87% (KDHS 2014)	175		152
Study population	**175**		**152**

3.7 Exclusion and inclusion criteria

Inclusion: Consenting primiparas residing in Viwandani/Mukuru Kwa Reuben and Korogocho/Huruma slums who had uncomplicated delivery to term, healthy singleton and discharged from selected maternity units within 48 hours of delivery, could be visited by a CHP and could be contacted by phone after discharge. **Exclusion:** Sick primiparas who could not participate or could not be visited by a CHP or had no access to phone or did not intend to reside at the study sites during the study period**.**

3.8 Sampling techniques (multi-stage sampling)

3.8.1 Sampling procedure for control and experimental site

Simple random sampling: randomly assigned by excel for cluster 1, Viwandani and Kwa Reuben and cluster 2 Korogocho and Huruma, with the lowest digit assigned to control.

3.8.2 Sampling procedure for facilities

Purposeful sampling: health facilities with maternities whose main catchment was the study sites were purposefully included in the study. The health facilities were: Viwadani: *Cana, Olivelink and Melihep* ; Korogocho :*Korogocho health centre, Tumaini clinic, Provide International and Jahmii Kipawa* ; Huruma slums ; *Jumuia hospital, Huruma nursing and Uzima white,* then Mukuru kwa Reuben; *Reuben Health Center*.

3.8.3 Sampling procedure for mothers: Convenience sampling

Primiparity, healthy singleton, normal delivery discharged within 48 hours of delivery and residing in either Korogocho/Huruma or Viwandani/Kwa Reuben is likely a rare occurrence, thus all mothers that met this criterion were conveniently considered for the study and recruited on a rolling basis until the sample size was attained.

3.8.4 Sample size determination and distribution

The sample size was calculated using a formula developed by Chan (2003) for the comparison of two proportions (two-sided) at 5% level of significance and 80% statistical power (Chan, 2003). Neither adoption of recommended PNC practices nor MSE is quantified in the reviewed literature, thus a generally agreed 50% (Mugenda & Mugenda, 1999) was assumed. An MSE study among primiparas in Singapore showed 16% difference in the two groups at six weeks (Shorey et al., 2015), while another on breastfeeding efficacy and EBF practice in Kiandutu slums in Thika showed 0.30 ES (Mituki D.M, 2017). This study proposed a 20% average effect size to increase MSE and eventually the adoption of recommended practices from 50% to 70%.

$$M = \frac{cX\pi_1(1-\pi_1)+\pi_2(1-\pi_2)}{(\pi_1-\pi_2)^2}$$ Sourced (Chan, 2003, p. 173)

Where:

M = sample size required in each group

C = 7.9, a ratio from a square of the sum of Z score of 80% power (0.842) and 5% significance (1.96). That is $(1.96 +0.842)^2 =7.9$

$\pi 1$ = first proportion estimated MSE before intervention = 0.5

$\pi 2$ = second proportion estimated MSE after intervention = 0.7

$\pi 1 - \pi 2$ = size difference of importance for this study = 0.2.

Therefore, $M=7.9 \{0.5(1-0.5) +0.7(1-0.7)\}/ (0.5 – 0.7)^2 = 91$ per group. A previous study had approximated a 30% dropout rate (Shorey et al., 2015) based on which a minimum of 118 participants in each group was required for this study. For two FDGs in each arm with 8 participants each, 16 participants were required in each group.

3.9 Construction of research instruments

The tools used in this study included educational videos a teaching guide for the CHP, A wall hanging for reinforcement, self-affirmation pamphlets, entry and exit questionnaires, a Perceived Maternal Parental Self-efficacy (PMPS-E) scale, and an FGD guide. The main educational video was created where a similar primipara from Mathare slum demonstrated key baby care practices while being guided step by step by a nurse. The activities included cleaning the bay, keeping the baby warm, daily cord-care, proper latching on the breast, bringing up the wind, and lying the baby on the back or side to sleep. The nurse also explained to the mother self-care practices, maternal and neonatal danger signs to look out for, and when to seek help. The last part of the video had the PI affirming the mothers. This video was used by the CHPs during the teaching session and uploaded on the mother's phone or that of a significant other for reference. Extra videos from *Global Health Media* on MDSs and NDSs, newborn care, and self-care practices were used for reinforcement (See Appendix 8).

A counseling guide (Appendix 6) and colored educational wall hanging (Appendix 11) were used by the CHPs to guide the teaching sessions. The recommended practices were crafted from *Healthy Mothers & newborns: guidelines for PNC 2016; WHO Recommendations on PNC of the Mother and the Newborn*, 2013 and *Counseling for Maternal and Newborn Health Care: A Handbook for Building Skills, WHO, 2013.* Self-affirmation pamphlets with maternal confidence appropriate affirmations were provided to each mother in English and Kiswahili (Appendix 12).

Entry and exit interviewer-administered questionnaires were used to collect the data. Entry data included the social demographic and facility variables (Appendix 2). Exit data after the intervention included the subcomponents of the PNPS (Appendix 3) as follows.

- A list of 8 key MDSs where the respondents stated if they experienced any incidence of each (scored out of 8 thus 0-8) and the action taken after the incidence (scored as sort care out of incidences).
- A list of 10 key NDSs where respondents stated if their neonates had any incidence of any (scored out of 10 thus 0-10) and the action taken after the incidence (scored as sought care out of total incidences)
- A list of 13 self-care practices whose frequency was scored on a Likert scale;- “always” (4), “very often” (3), “sometimes” (2), “rarely” (1) and “never” (0). The score ranged from 0-52.
- Eight key baby care practices were presented to the mothers, and they were to describe how they did it and it was scored as correct or incorrect. (Scored out of 8 thus 0-8)
- The attendance of contacts for the mother was a yes or no at 2 weeks and 6 weeks.
- Attendance of the baby wellness clinic at 2 weeks and 6 weeks was also a yes or no.

The MSE was captured using the PMPS-E questionnaire- a 20-question scale by Ingram et al (Ingram J, Blair PS, Powell JE, 2016). The newborn care-related questions are rated on a four-point Likert scale ranging from 1 (strongly disagree), 2 (disagree), 3 (Agree) and 4 (strongly agree). Overall score ranges between 20-80 with a greater score meaning a higher level of MSE (Appendix 4). The FGD guide captured qualitative data including satisfaction with post-discharge PNE, challenges and barriers faced during the postnatal period, maternal confidence, and ways to improve post-discharge care (Appendix 5).

3.10 Pre-test

Pre-testing of questionnaires was done in Kibera, the largest slum in Nairobi where 8.5 % of the sample size (20 primiparas) were incorporated. The analysis revealed some ambiguous and redundant questions which were merged or dropped, and key missing questions added. Complex concepts especially on danger signs were further explained to the interviewers where a need to highlight key signs was noted and implemented.

3.11 Validity

The content validity or degree of accuracy of research tools was ensured through pre-testing and expert review. The Research Assistant (RA)- a graduate, trained researcher working at the Organization of African Youth- was rigorously trained in data collection including translating the questions to Swahili where needed. Further, the completeness of research instruments was checked daily during the study period, and having a control group to compare increased validity. To mitigate contamination in the control group, a question on whether they had received any such materials or information was asked before the exit interview to exclude them from the final analysis. None of the respondents was found to have information.

3.12 Reliability

The consistency of a measure was ensured by using well-designed and clear questionnaires. Shorey et. al 2014 established the Chronbalch Alpha score which is a measure of internal consistency — for the PMSE scale to be 0.89. The other questionnaires underwent expert review by the Senior Research Scientist & Head, Maternal & Child Wellbeing Unit at APHRC and the study supervisors. Moreover, the same research instruments were used to train the RA and applied to all the study participants.

To ensure consistency, supervision was done by the principal investigator and the test re-test method was used with 10% of respondents on each arm re-interviewed by the principal investigator, face to face or through telephone calls with zero difference in means.

3.13 The Intervention

The intervention included a comprehensive WHO-recommended PNE content including the identification and health-seeking for MDSs and NDSs, baby care practices including EBF, cord care, self-care practices and the use of PNC contacts at two and six weeks. To enhance self-efficacy the study used multiple modalities in line with Bandura's SE theory. For mastery of experience, there was a home visit in the first week by a specially trained CHP on counseling for maternal and neonatal health who provided a 45-minute practical didactic teaching including demonstrations of basic baby care tasks such as bathing, cord care, breastfeeding, and putting the neonate to sleep. The rationale for the use of CHPs as the main agents of delivery was premised on WHO's evidence-based recommendation for home visits "by skilled providers or well-trained and supervised CHPs" in the first week after birth (WHO, 2013b).

To further increase awareness, informational support, and reinforcement of PNE content through printed media, a wall hanging designed in English and Kiswahili was provided. The content of the wall hanging was MDSs and NDSs to look out for with a call to seek immediate healthcare for the same, baby care tips, self-care tips, and contacts of the CHP. The CHP went through the content with the mother and then hung it on a wall where the mother spent more time resting (see Appendix 17).

For vicarious experience- the goal being to observe a social model succeed in a role-, the study used a video of a similar mother – from Mathare slum demonstrating key baby care skills while being directed by a nurse. The video which also included congratulatory and affirmation messages, was uploaded on the mother/significant others' phone for reference. For verbal persuasion - the goal being to enhance social support- where the primiparas receive praise and encouragement, the CHPs provided constructive feedback while the significant others were encouraged to affirm the primiparas. For physiological and emotional arousal - the goal being to reduce stress and doubts- the study employed a self-affirmation pamphlet and troubleshooting telephone access to CHPs. In terms of M-health, in addition to mothers having 24-hour telephone access to the CHPs for informational and emotional support, the CHPs called the mothers three times at two, four, and six weeks and sent short message (SMS) reminders for PNC contacts between 7–14 days and at six weeks. For further informational support, extra videos on newborn care, self-care, MDSs, and NDSs from *Global Health Media Project;* (Global Health Media Project, n.d.) were used by the CHPs for reinforcement (see Appendix 8).

3.14 Study arms

Intervention group: Participants apportioned to the experimental group were discharged as per the routine facility criteria, and a visit by the CHP was scheduled within the first 7 days postpartum in which the intervention was delivered in addition to routine MoH PNC.

Control group: Participants assigned to the control group were discharged per the routine facility criteria after providing a telephone contact for the final exit interview at six weeks. (See the study flow chart Appendix 10). The dyad received routine MoH PNC.

3.15 Data collection techniques and process

The sampling frame was derived from the list of mothers cleared for discharge for the day. Basic eligibility information including parity, mode of delivery, single birth, date and time of birth to determine duration after birth, wellness of the baby and mother; and the place of residence was obtained from the nurse in-charge and eligible mothers identified.

The RA approached the eligible mothers upon discharge, explained the study, and obtained written informed consent (See Appendix 1a/1b). The consenting mother was enrolled, and relevant entry data was collected and recorded by the RA on the entry questionnaire (See Appendix 2). This included socio-demographic data such as age, level of education, residence, household income, occupation, marital status, perceived satisfaction with in-hospital PNE, and their mobile telephone contact with an alternative contact in case they were not reachable. The RA informed the mothers in the intervention arm of the first-week visit and agreed on the logistics. Further facility information such as type, tier, and workload ratio was obtained from the nurse in charge.

Following the intervention, an exit interview was conducted on both the intervention and control participants. Outcome data on the selected PNP outcomes: health seeking for MDSs and NDSs; adoption of recommended self-care practices; adoption of recommended baby care practices; attendance of PNC contact at two weeks and at six weeks was captured through interviewer-administered questionnaires (Appendix 3) at 6-8 weeks postpartum. Closed-ended questions were used to capture quantitative data to test the association of the intervention to the other quantifiable outcome variables. MSE was measured using the 20-question PMSE scale by Ingram et al (Ingram J, Blair PS, Powell JE, 2016) (Appendix 4).

An FDG guide was used to collect qualitative data which was recorded on the phone, and notes were taken on the satisfaction, challenges, and recommendations of mothers on post-discharge PNC (Appendix 5). The synergy of the group setting was helpful in eliciting ideas and discussions which were transcribed verbatim. Groups were coded as Viwandani E1 and Kwa Reuben E2; Korogocho C1 and Huruma C2 with participants allocated no.1-8 to enable coding of participants by group and number.

3.16 Data processing and analysis

Data were collected from May to December 2021 using interviewer-administered questionaries. Such data were checked for completeness then coded and entered in Open Data Kit (ODK) before being exported to IBM SPSS version 20.0 for analysis. Descriptive statistics such as percentages, mean and standard deviation were used to report health facility, demographic characteristics, and outcome variables. To test the association between the independent and dependent variables, Chi-square, Fishers exact, t-test and Mann-Whitney tests were applied. To further isolate the predictor effect of the intervention on the outcome variables and minimize confounders, multiple linear or logistic regression models were conducted for continuous and categorical data respectively, and adjusted for background variables/covariates. Associations, differences, and effects were considered significant at $P<0.05$, two-tailed. The Sobel test was used to determine the mediation role of MSE between the intervention and the adoption of recommended postnatal practices. Hedges' g, - a Cohens' d alternative for measuring effect size where different sizes of samples are involved - was used to calculate the effect size of the intervention.

For qualitative data, the content analysis method was used where common responses were identified, color-coded, labelled, and meanings deduced in line with postnatal practices, views on support, associated challenges, and desired improvements.

3.17 Logistical and ethical considerations

The study was approved by Graduate School, and ethical clearance (No. PKU/2173/11317) was granted by the Kenyatta University Ethical Review Committee (See Appendix 14). A research permit License No: NACOSTI/P/21/9084, was granted by the National Commission for Science, Technology and Innovation (NACOSTI) (Appendix 13). Further, written permission was obtained from the Nairobi County Health Management (See Appendix 15), and from the administrators at the facility level. Consent forms were explained, signed, and obtained from each respondent in Kiswahili or English. Any information acquired from the participants was kept confidential and used only for the study.

The data was de-identified by eliminating the telephone number on data entry and using questionnaire codes. Electronic data files were password protected while paper-based files were kept in locked cabinets by the principal investigator. No incentives were given to the study participants. Written permission was obtained from the Global Media Project to use some of their videos to support the intervention. Any respondents found sick or with sick newborns during the intervention or data collection were advised to seek health care at the nearest facility.

CHAPTER FOUR: RESULTS

4.1: Introduction

Based on the four research objectives outlined in the first chapter, the study's findings are presented in this chapter.

4.1 Social-demographic and facility-related characteristics of the participants

A total of 236 participants were recruited: 118 in the experimental group and 118 in the control group. The attrition rate was 0.4% (117 experimental, 118 control) after one experimental participant dropped out after losing her newborn. The average age of the participants was 23.3 years (SD =14.1). Majority of the participants were married; 68.4% (n=80) in the experimental group and 64% (n = 75) in the control, had some form of secondary education; 75% (n=64) experimental and 56.7% (n=67) control), unemployed 83% (n=97) experimental, 53% (n=62) control), delivered in private facilities; 50% (n=59) control and 55% (n=64) which were mostly level 3 facilities where 73% (n=86) in the control and 86% (n=101) in experimental delivered and had a workload ration of 1:1; 42.4% (n=50) in the control and 55.6% (n=65) in the experimental group. The response rate for income was extremely low at 28% (65), likely due to COVID-19-related loss of livelihoods, and thus not included in the analysis.

There was a statistically significant difference between the groups on facility type (F=58.1, p=0.00); facility level ($\chi 2$= 6.5, df.1, p=0.015) marital status (F=20.5,p=0.00); occupation (F=44.6, p=0.00), and a statistically significant difference in postnatal ward workload ratio (*t*=-5.14, p=0.00) and LOHS (U=5848, p=0.03). Age, education level, and satisfaction with in-hospital PNE were not significantly different as shown in Table 4.1.

Table 4.1: Comparison of demographic and facility characteristics of the groups.

Characteristic	Control (118)	Experimental (117)	Total (235)	Statistical test
Facility type, n (%)				
NGO/FBO	23 (19.5)	53 (45.3)	76 (32.3)	*Fishers* 58.1
Public	36 (30.5)	0 (0.0)	36 (15.3)	**p=0.00***
Private	59 (50.0)	64 (54.7)	123 (52.3)	
Facility level, n (%)				
Level 2	32 (27.1)	16 (13.7)	48 (20.4)	$\chi 2$= 6.5, df.1
Level 3	86 (72.9)	101 (86.3)	187 (79.6)	**p=0.015***
Postnatal ward workload ratio, n (%)				
1:1	50 (42.4)	65 (55.6)	115 (48.9)	*t*=-5.14, **p=0.00***
1:2	27 (22.9)	52 (44.4)	79 (33.6)	
1:3	41 (34.7)	0 (0.0)	41 (17.4)	
Age (years), (mean, SD)				
Respondents	23.8 (4.2)	22.9 (19.5)	23.3 (14.1)	t=-0.448, p=0.65
Marital status, n (%)				
Single	23 (19.7)	32 (27.4)	55 (23.4)	*Fishers* =20.5
Married	75 (64.1)	80 (68.4)	155 (66)	**p=0.00***
Widowed	3 (2.6)	0 (0.0)	3 (1.3)	
Separated	16 (13.7)	1 (0.9)	17 (7.2)	
Education level, n (%)				
No education	2 (1.7)	0 (0.0)	2 (0.9)	*Fishers* 4.8
Pry uncompleted	9 (7.6)	12 (10.3)	21 (8.9)	p=0.43
Pry completed	21 (17.8)	19 (16.2)	40 (17)	
Sec uncompleted	24 (20.3)	25 (21.4)	49 (20.9)	
Sec completed	43 (36.4)	50 (42.7)	93 (39.6)	
Tertiary	19 (16.1)	11 (9.4)	30(12.8)	
Occupation, n (%)				
Employed	9 (7.6)	0 (0.0)	9 (3.8)	*Fishers* = 44.6
Self-employed	32 (27.1)	3 (2.6)	35 (14.9)	**p=0.00***
Casual job	15 (12.7)	17 (14.5)	32 (13.6)	
Unemployed	62 (52.5)	97 (82.9)	159 (67.7)	
Length of hospital stay, n (%)				
<=6 hours	18 (15.7)	23 (19.7)	41 (17.4)	*U*=5848
7-12 hours	63 (54.8)	31 (26.5)	95 (40.4)	**p=0.031***
13-24 hours	28 (24.3)	58 (49.6)	88 (37.4)	
25-48 hours	6 (5.2)	5 (4.3)	11 (4.7)	
Satisfaction with in-hospital PNE, n (%)				
Very satisfied	47 (40.2)	57 (48.7)	104 (44.3)	*U*=6103
Satisfied	56 (47.9)	54 (46.2)	111 (47.2)	p=0.088
Neutral	14 (12.0)	3 (2.6)	17 (7.2)	
Dissatisfied	0 (0.0)	2 (1.7)	2 (0.9)	
Very dissatisfied	0 (0.0)	1 (0.9)	1 (0.4)	

***n.- number, %- percent, SD- standard deviation, pry- primary, sec- secondary, * significant**

To determine the effect of the intervention on MSE and PNPs, independent t-tests, and chi-square tests were applied first to determine if there was a significant difference or association. To further isolate the effect of the intervention, multiple regression for continuous variables and logistical regression for categorical data adjusted for covariates were calculated. All covariates (marital status, education level, facility level, LOHS, satisfaction with pre-discharge teaching, occupation, age, facility type, and postnatal ward workload ratio), were included in the regression analysis to prevent omitted variable bias.

4.2 Effect of follow-up post-discharge postnatal education intervention on maternal self-efficacy.

The PMP S-E tool was used to assess participants' MSE post-intervention. The tool focused on 20 features yielding total scores that varied from 20 to 80. Independent t-test was conducted to test for significant differences (Table 4.2).

Table 4.2: Comparison of maternal self-efficacy mean between the groups

Group	**n**	**mean**	**std. dev**	**statistical test**
Experimental	117	76.4	6.3	t=11.69, P=0.000
Control	118	62.4	11.3	

***n- number, std. dev- standard deviation**

The results showed a significant difference (t=11.69, P=0.000) in MSE between experimental and control groups where the mean perceived MSE was 76.4±6.3 among the experimental group versus 62.4±11.3 among the control group. This study envisaged a 0.2 effect size on MSE improvement with the intervention but had better outcomes with a Hedges'*g*. of 1.5 indicating a large effect size since it is beyond Cohen's 0.8 mark for a large effect size (Cohen, 1992)

Multiple linear regression was used to determine if the PNE intervention predicted MSE adjusted for covariates (e*ducation level, occupation, age, marital status, facility level, facility type, facility workload ratio, satisfaction with pre-discharge teaching, and LOHS*). Dummy variables were created for categorical variables: facility type, occupation, and marital status. PNE intervention was a significant positive predictor of MSE by 59%. (β=0.593, p=0.00) as indicated in Table 4.3.

Table 4.3: Effect of the intervention on maternal self-efficacy.

	R^2	β	p-value
Maternal self-efficacy			
Experimental (n=117)	0.48	0.59	0.00
Control (n=118)			

***n- number, β- beta coefficient**

Hypothesis results for MSE : The null hypothesis was therefore rejected given that compared to the control group, the experimental group had a statistically significantly higher MSE. The FGDs' findings supported this.

Participants in the experimental sites expressed appreciation for the multi-pronged intervention. "*After the teaching by the CHP it was easy to take care of the baby…and if I forget…. I watch the video or chart if doing the right thing which boosted my confidence,"* (respondent E1,4). Knowing they were not alone gave them peace of mind. "*Nilipojua naweza pigia CHP wangu wakati wowote wasiwasi ya kutunza mtoto mchanga iliisha*. *I knew I was not alone*" (Knowing I could call the CHP anytime quelled my fears of caring for a neonate) (respondent, E2-5). *"CHP showed me how to wash and breastfeed my baby and encouraged me when I was hopeless. Charts have helped me in my being a mum; they.. I read, I felt covered",* (respondent, E1,3).

4.3 Effect of a post-discharge postnatal education intervention on adoption of the recommended postnatal practices

The recommended PNPs score in this study was a composite variable made up of eight (8) self-reported components: emergency health-seeking for MDSs; emergency health-seeking NDSs; self-care practices, baby care practices, two weeks contact for the neonate; six weeks contact for the neonate, two weeks postpartum contact and six weeks postpartum visit. To mitigate the risk of loss of individual variables' information or alteration of the relationship with other variables, each of the components was analyzed first.

4.3.1 Effect of post-discharge postnatal education intervention on the adoption of emergency health seeking after maternal danger signs.

To determine adoption rates, incidences per group were determined as a process indicator. In total, 353 MDS experiences were reported out of which 86 were from experimental and 267 from control. A total of 151 mothers, 51 in experimental and 100 in control reported having an incidence/s. This translated to 85% (100) of respondents in control and 44% (51) in the experimental group having experienced MDSs (See Figure 4.1).

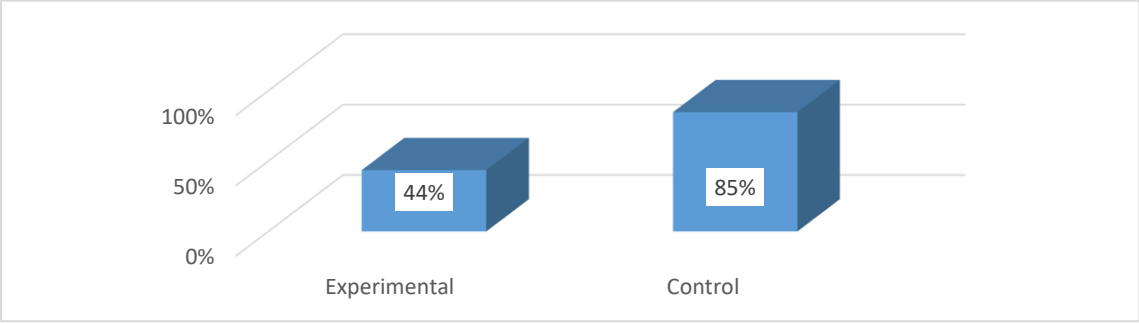


Figure 4.1: Proportion of respondents that experienced maternal danger signs per group.

The disaggregated proportion of respondents that reported to have experienced symptoms of each of the 8 MDS is shown in Figure 4.2.

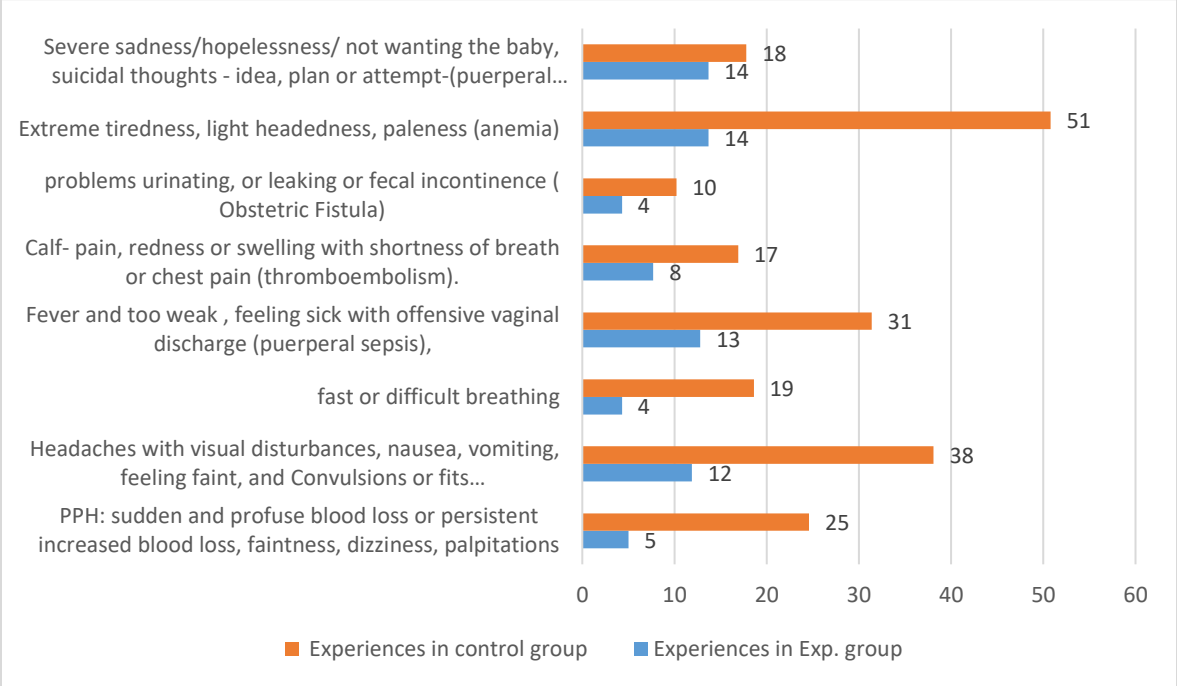


Figure 4.2: Proportion of respondents that reported experiencing signs of each maternal danger sign among the groups.

Respondents in the FGDs mentioned some of the health challenges they faced after delivery to be excessive bleeding, body weakness, stomach/back pains, low moods among others. "*I had excessive bleeding which prompted me to go back to the hospital"*, (respondent, E1,6). *"Worrying about the baby being sick and cried a lot in turn gave me a lot of stress and low moods"*, respondent, FGD - Huruma. Majority of the respondents said they felt stressed due to lack of finances. *"Feeling stressed because of lack of basic needs"*, (respondent, C2,5). "*I had stress due to lack of money, poverty and no social support. I had headaches"*, (respondent, C1,1)

The study further compared the proportion of respondents that sought urgent health care as recommended after experiencing MDS. The results demonstrated a higher probability of respondents from the control group (91% of 267 incidences) seeking healthcare after experiencing MDS than experimental (88% of 86 incidences) as shown in Figure 4.3.

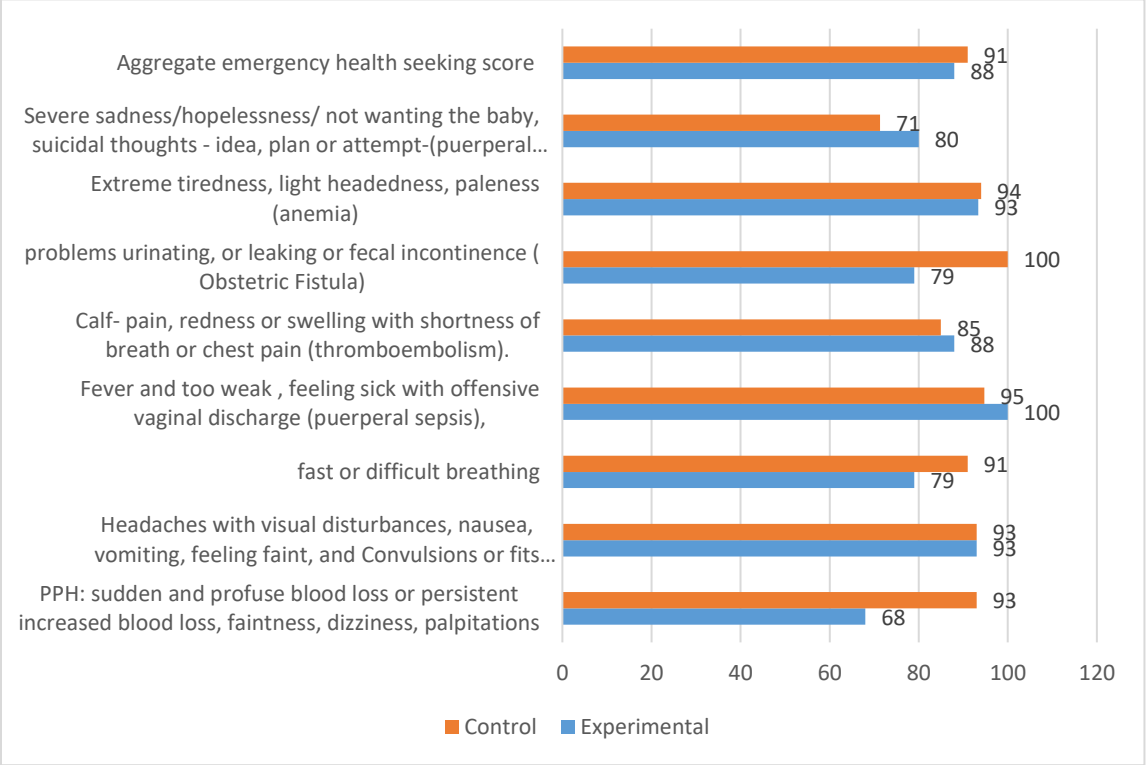


Figure 4.3: Comparison of the proportion of respondents that sought healthcare after experiencing maternal danger signs.

A t-test demonstrated a significant difference between the experimental and control group total reported MDS incidences (t=-9.5, p=0.00) and respondents that experienced MDS per group (t-7.3,p=0.00) with significantly fewer incidences in the experimental group. A significant difference was also noted in subsequent health seeking (t=-2.8, p=0.01) after an incidence indicating less health seeking in the experimental group. (See Table 4.4)

Table 4.4: Comparison of maternal danger signs incidences and adoption of emergency health-seeking among the groups

Group	**n**	**mean (std. dev)**	**statistical test**
Total MDS incidences per mother			
Experimental	(n=117)	0.74(1.11)	t=-9.5, p=0.00
Control group	(n=118)	2.26(1.35)	
Respondents that experienced incidences per group			
Experimental	(n=117)	0.44(0.5)	t=-7.3, p=0.00
Control	(n=118)	0.85(0.36)	
Respondents that sought health care over MDS incidences			
Experimental	(n=51)	0.86(0.33)	t=-2.8, p=0.01
Control group	(n=100)	0.97(0.13)	

***n- number, std. dev- standard deviation**

Multiple linear regression was conducted to isolate the effect of PNE intervention on total incidences of MDSs and subsequent health-seeking adjusted for covariates. The intervention was a significant protective predictor of total MDS incidences (β=-0.59, p=0.00) thus 59% fewer incidences in the experimental arm while it was not a significant predictor of adoption of health-seeking after incidences (β=-0.11, p=0.31). The logistic regression analysis showed the intervention was significantly protective where the odds of experiencing MDS incidences was 0.036 in the experimental compared to the control group (OR 0.036, p=0.00, 95% CI 0.009-0.151) (27.8 more chances in control). (See Table 4.5).

Table 4.5: Effect of the intervention on maternal danger signs incidences and health-seeking.

	R^2 /Pseudo R^2	β/OR	p-value	CI (95%)
Total MDS incidences per mother				
Experimental (n=117)	0.42	-0.59	0.00	
Control group (n=118)				
Respondents that experienced incidences per group				
Experimental (n=117)	‡ 0.31	0.036 (OR)	0.00	[0.009-0.151]
Control group (n=118)				
Health seeking after MDS incidence				
Experimental (n=51)	0.165	-0.11	0.31	
Control group (n=100)				

***n- number, ‡ Pseudo R^2 ,*β* standardized coefficient, CI confidence interval**

Respondents in both groups narrated incidences of MDSs and their action. *"Hiyo video ya kujua dalili za magonjwa ilinisaidia sana saa ile nilianza kumwa na tumbo na kutokwa na damu mingi.. nikaenda clinic"* (the video on danger signs helped me a lot when I started getting stomach-ache and bleeding too much… I went to a health facility), (Respondent E2,4). *"Niliumwa na mgongo na tumbo sana mpaka nikaogopa nikaenda hosi"* I had serious back ache and stomachache, I got worried and went to the health facility), (respondent C1,8).

Some of the respondents did not seek medical attention for some of the MDS's, preferring to consult mostly the CHPs for those in experimental group and friends or family members. "*My breasts were extremely painful and cracked but I called the CHP who told me to massage with hot towel and apply vaseline*", (respondent E2,7). *"I was just feeling weak, lacked strength and tired the first weeks but was told by my friends nikawaida itaisha. So nikavumilia* (I was told it is normal, so I persevered), (respondent E2,3). "*Sikuona kama kukua na low moods ni kitu serious, niliongea na mama yangua akasema niombe"* (I did not know that having low moods and crying is a serious thing, I talked to my mum, and she told me to pray), (respondent C2,2).

4.3.2 Effect of post-discharge postnatal education intervention on the adoption of emergency health-seeking upon experiencing neonatal danger signs.

The study sought to establish the proportion of primiparas whose newborns experienced 10 key NDSs. Out of the 379 total NDS incidences reported, 23% (86) were from the experimental group while 77% (293) were from the control. Out of 158 babies that were reported to experience NDS, (65% (n=102) were from the control group which translated to 86% (102) of the control and 48% of the experimental group. (see Figure 4.4).

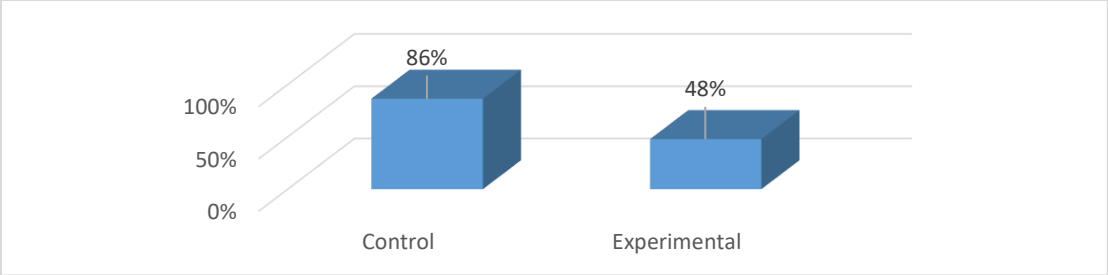


Figure 4.4: Proportion of babies that experienced neonatal danger signs in each group.

The most reported NDS was fever; 46% in the control (n=118) , 24% in experimental group (n=117) and the least was convulsions 2% experimental and 5% control. (See Figure 4.5).

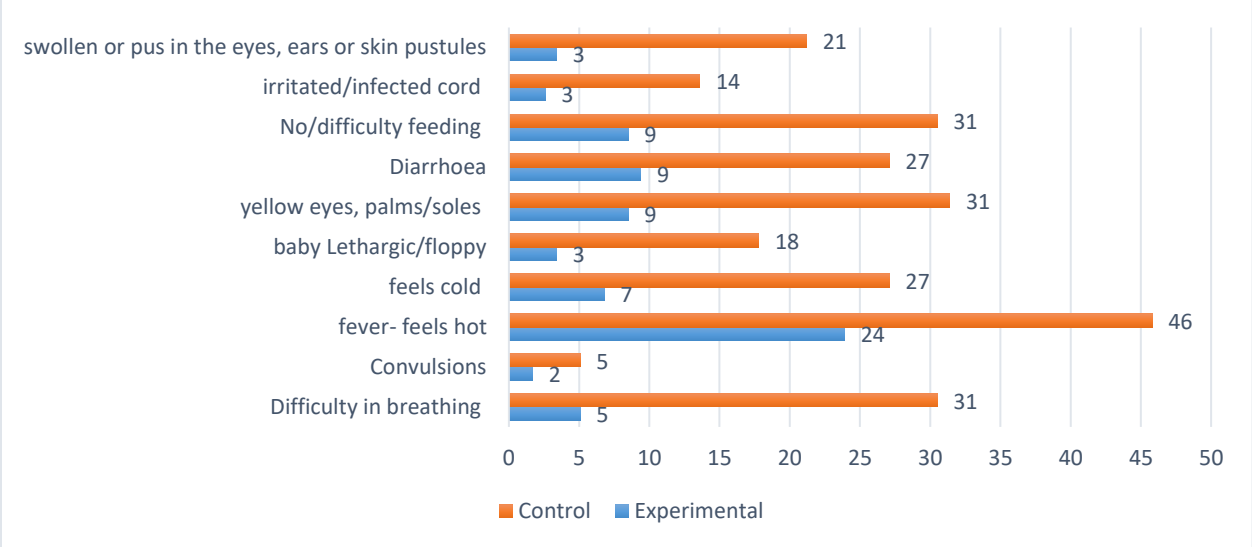


Figure 4.5: Proportion of babies that experienced each neonatal danger sign per group

The crucial action of the mother seeking emergency healthcare for the baby after noticing an NDS was determined. In both groups majority of the mothers reported to have sought healthcare for their babies with only a slight improvement in the experimental group 96% viz 94% in the control as shown in Figure 4.6. (Experimental n=56, control n=102)

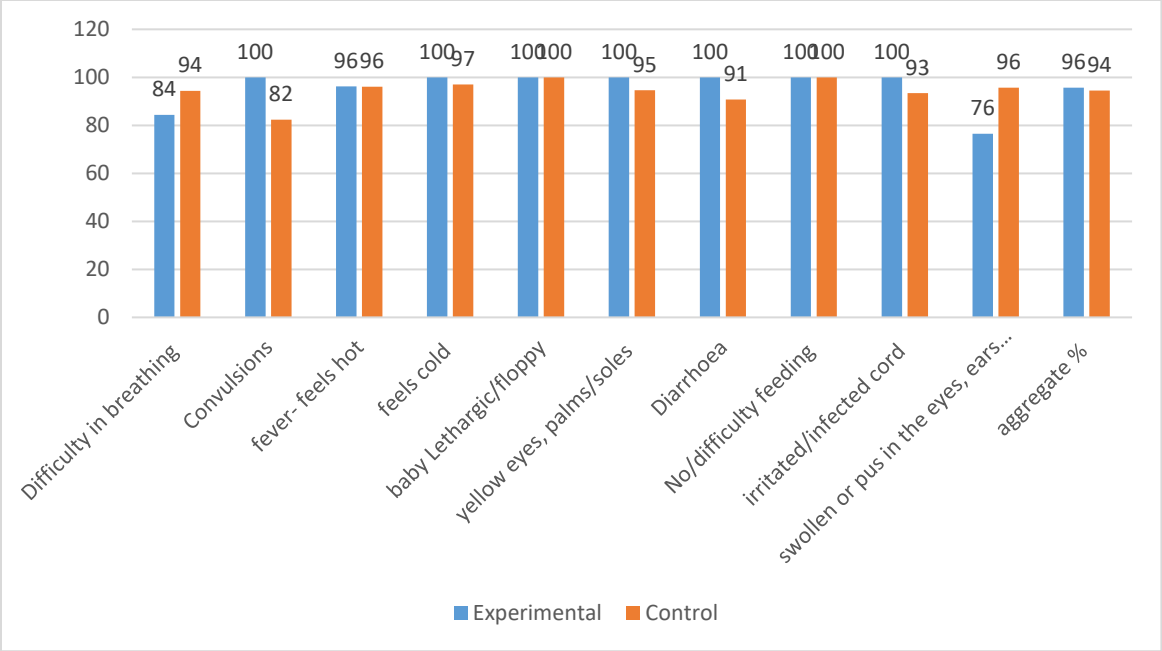


Figure 4.6: Proportion of babies that were taken for emergency care after experiencing neonatal danger signs.

A t-test further showed a statistically significant difference between the two groups on reported NDSs per baby (t=-10.56, p=0.00) and total babies that had incidences (t=-6.87, p=0.00) but no statistically significant difference in the adoption of health seeking on experiencing NDS's (*t=-0.62*, p=0.53). The inverse relationship of the intervention with NDS incidences implied a protective effect. (See Table 4.6).

Table 4.6 : Effect of the intervention on incidences and health-seeking for neonatal danger signs.

	n	Mean (SD)	Statistical test	p-value
Total NDS incidences per baby				
Experimental	(n=117)	0.74(1.05)	t=-10.56	0.00
Control group	(n=118)	2.49(1.46)		
Total neonates that had incidences				
Experimental	(n=117)	0.48(0.50)	t=-6.67	0.00
Control group	(n=118)	0.86(0.35)		
Respondents that sought health care over NDS incidences.				
Experimental	(n=56)	0.95(0.23)	t=-0.62	0.53
Control group	(n=102)	0.97(0.16)		

***n-number, std. dev- standard deviation**

Multiple linear regression for numerical data and logistic regression analysis for categorical data was conducted to isolate the effect of PNE intervention on health-seeking for NDSs adjusted for covariates. There was a statistically significant difference between the groups in all variables except the adoption of health-seeking after an NDS incident (β=-0.04, p=0.73). The PNE intervention demonstrated a 54% inverse prediction (protective) of NDS experiences (β=-0.54, p=0.00). The intervention was protective with the 0.19 odds of experiencing an NDS in the experimental group (OR=0.19, p=0.00, 95% CI 0.076-0.49) compared to control (or 5.2 times chances in the control). (See Table 4.7).

Table 4.7: Effect of intervention on incidences and health-seeking for neonatal danger signs.

	R^2/Pseudo-R^2	β/OR	p-value	CI (95%)
Total NDS incidences				
Experimental (n=117)	0.40	-0.54	0.00	
Control group (n=118)				
Babies that experienced incidences per group				
Experimental (n=117)	⁑ 0.31	0.193(OR)	0.00	[0.076-0.49]
Control group (n=118)				
Correct action (sought health care)				
Experimental (n=56)	0.194	-0.036	0.73	
Control group (n=102)				

***n- number, R^2 R square, *β* standardized coefficient, CI confidence interval, ⁑ Pseudo R^2**

The respondents in FGD's narrated some of their NDS experiences and actions that they took. *"Turning yellow shocked me I took the baby to the hospital"* (respondent C2,6). *"Alipokataa kunyonya, analia na halali, nilimpeleka hospitali"* (When the baby refused to breastfeed, kept crying and could not sleep I took her to the health facility), (respondent, E1,4)

4.3.3 Effect of post-discharge postnatal education intervention on adoption of recommended self-care practices

There were 13 recommended self-care practices with a highest possible value of 4 for "always" on the Likert scale thus a highest possible total of 52 per respondent. The analysis showed that 75% (n-88) of respondents in experimental group, on average, reported that they always practiced the self-care practices measured as opposed to 39% (n=46) in the control group. None of the respondents in both groups reported to have rarely or never practised the self-care practices as shown in Figure 4.7.

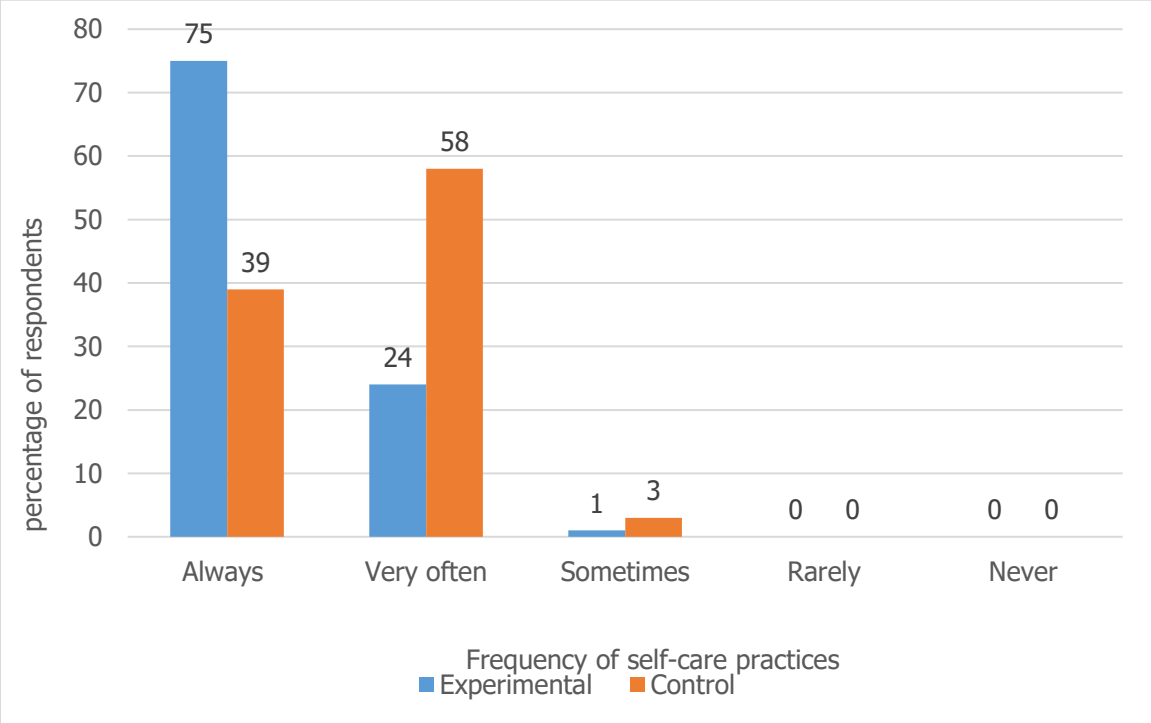


Figure 4.7: Comparison of adoption of self-care practices among the groups.

The experimental group performed better with an aggregate score of 84% compared to the control with 72%. Physical and pelvic exercises scored the lowest among both groups. Results of other self-care practices are shown in Figure 4.8*:*

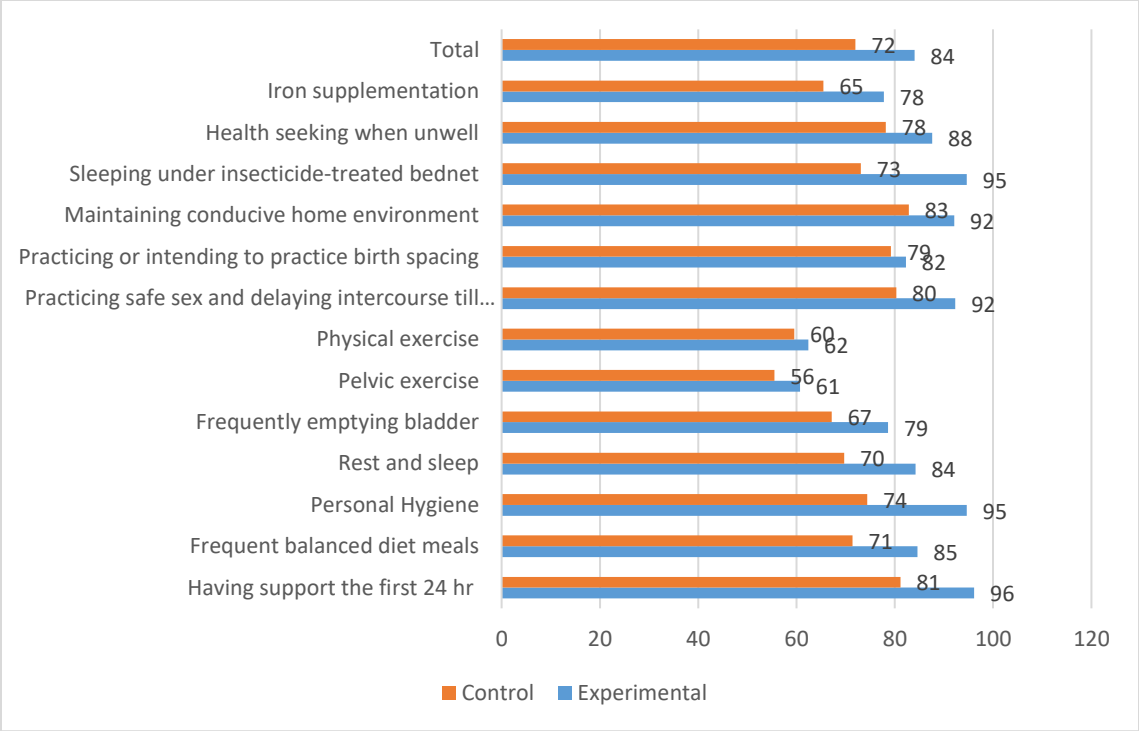


Figure 4.8: Comparison of each self-care practice score among the groups

There was a statistically significant difference in the adoption of recommended self-care practices (*U*=4380, p=0.00) between the experimental and control groups.

Table 4.8: Comparison of the adoption of self-care practices between the groups.

Frequency of self-care practices	**Experimental (n=117)**	**Control (n=118)**	**Statistical test Mann-Whitney**
	n(%)	n(%)	
Always	88 (75)	46 (39)	*U*=4380, p=0.00
Very often	28 (24)	68 (58)	
Sometimes	1 (1)	4 (3)	
Rarely	0 (0)	0 (0)	
Never	0 (0)	0 (0)	

***n.- number, %- percent**

The Likert scale data were transformed into numerical data by calculating the means of each respondent to enable multiple linear regression analysis. There was a statistically significant difference between the groups (β=0.39, p=0.00) demonstrating that the PNE intervention predicted 39% better adoption of self-care practices adjusted for covariates as shown in Table 4.9.

Table 4.9: Effect of the intervention on self-care practices.

	R^2	β	p-value
Self-care practices			
Experimental (n=117)	0.33	0.39	0.00
Control (n=118)			

***n- number, R^2 R square,*β* standardized coefficient,**

Though most of the respondents expressed willingness to practice self-care practices in the FGDs, some highlighted hindrances to some of the components such as the inability to obtain good maternal nutrition. *"Good food keeps you healthy and strong. I do all I can to eat well most of the times"*,(*r*espondent, C2-5). *'Kukula vizuri kunanihakikishia mtoto atakua healthy*" (eating well is an assurance that my baby will be well), (respondent, E1,6) Lack of livelihood posed a problem with food shortage mentioned as a major challenge in all the FGDs. *"Kukosa kibarua kulifanya nikose chakula nika-lose weight sana na nikakosa maziwa"* (I don't get casual jobs so I lacked food, lost weight and lacked breast milk), (respondent, C2,3). Other challenges were lack of rest and housing problems. *"Overworking, had to do house chores. House is congested"*, respondent, FGD – Viwadani. *"kurudi kibarua (*going back to menial jobs *immediately after giving birth because of lack of support was stressful. I didn't rest'),* (respondent, E2,8).

Domestic violence was also mentioned *"Bwana yangu anapenda kunichapa sana, so sijafurahia uzazi" (m*y husband is fond of beating me so I haven't enjoyed motherhood) (Respondent C1,1) Some respondents expressed discomfort with some practices such as care of perinium wound *"Being told to sit on a warm salty water for the birth wound was stressing and I could not keep up",* (respondent C1,5). Structural issues were a challenge too. *"The demolition of houses affects our health because we are left to sleep outside in the cold",*(respondent C1,6)

On social support and affirmations, most of the respondents said they received support from their husbands/boyfriends, mothers, CHPs, neighbors and friends who have given birth before. However, some felt the CHPs should visit more frequently. "*Nilifurahia kutembelewa na CHP wangu lakini angekuja mara mingi*", (respondent E2,3) (I was happy to be visited by the CHP but I wished it happened more). *"I read the pamphlet and tried to do what was written like maintaining good hygiene, walking, talking to others, resting. The affirmations also helped me",* (respondent E2,4) Some respondents described their efforts to calm down. *"I have avoided things that may give me stress so that I have peace, and I talk to my baby daddy* (father of my child) *when stressed",*(respondent C2,8).

4.3.4 Effect of post-discharge postnatal education intervention on the adoption of recommended baby care practices

Seven baby care practices were evaluated. All the respondents reported having their babies immunized at six weeks, and over 90% of both groups reported practicing EBF, cord care, keeping the baby warm, cleaning the baby daily, and correct sleeping position — lying on the side. The aggregate score was the same for both groups at 97%. (See Figure 4.9)

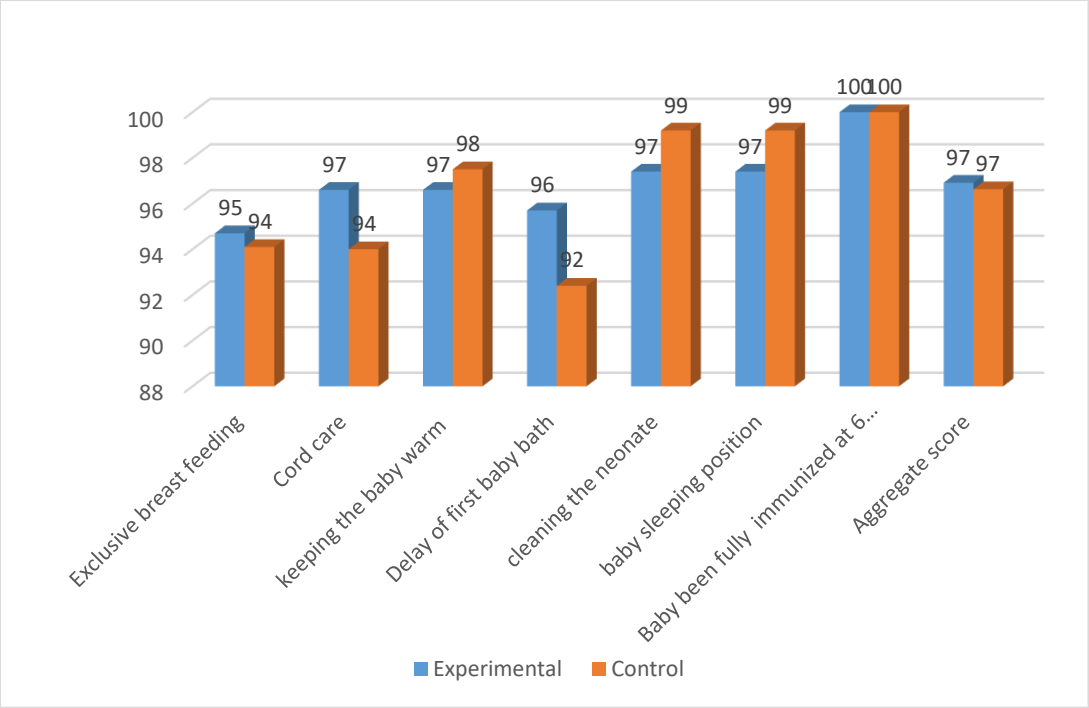


Figure 4.9: Comparison of adoption of recommended baby care practices amongst the groups.

There was no statistically significant difference (t=0.44, P=0.234) in the adoption of baby care practices between experimental and control groups with a mean score of 6.79±0.45 among the experimental group versus 6.76±0.65 in the control group out of the seven practices measured.

Table 4.10**:** Comparison of adoption of baby care practices among the groups

Group	**n**	**mean**	**std. dev**	**Statistical test**
Experimental	117	6.79	0.45	t=0.442, P=0.234
Control	118	6.76	0.65	

***n- number, std. dev- standard deviation**

A multiple regression analysis to isolate the effect of the PNE intervention controlling for covariates, showed no significant prediction (β=0.021, p=0.80). (See Table 4.11)

Table 4.11: Effect of the intervention on the adoption of baby care practices.

	R^2	β	p
Adoption of baby care practices			
Experimental (n=117)	0.147	0.021	0.803
Control (n=118)			

***n- number, R^2 R square,*β* standardized coefficient**

On important baby care practices, the FGD respondents highlighted: breastfeeding in the right manner, keeping the baby clean daily, keeping the baby warm, keeping the baby happy by changing soiled diapers and playing with them, sunbathing the baby, massaging the baby, eating well to ensure that the baby gets enough milk, and sleeping under a mosquito net as important practices. A few respondents also highlighted a need to seek care for the baby. "*Take the newborn to the hospital when one sees signs of sickness, for immunization and checkups and following instructions from the doctors is important*", (respondent, E2,2).

However, some respondents expressed challenges to adopting some baby care practices such as breastfeeding. *"Coz*(because) *of lack of enough food to sustain me, I was unable to produce enough milk for the child so I give her milk from the shop",* (respondent, E1,5) Getting basic needs for the baby was a challenge to some respondents, *"I lacked basic baby things like diapers and baby soaps",* (respondent, C1,7). "*Ningetaka kupatia mtoto my best but sina uwezo*" (I would love to give my baby the best but have no financial ability to do this), (respondent, E2,6)

4.3.5 Effect of post-discharge postnatal education intervention on utilization of postnatal care contact at two and six weeks postpartum

4.3.5.1 Attendance of newborn postnatal care contact at two and six weeks

The study sought to establish the effect of the intervention on postnatal contact at two and six weeks postpartum. At two weeks and six weeks, 99% and 100% of the respondents in the experimental group reported taking their newborns for check-up compared to 92% and 98% respectively for the control group. (Exp n=117, control n=118) (See Figure 4.10)

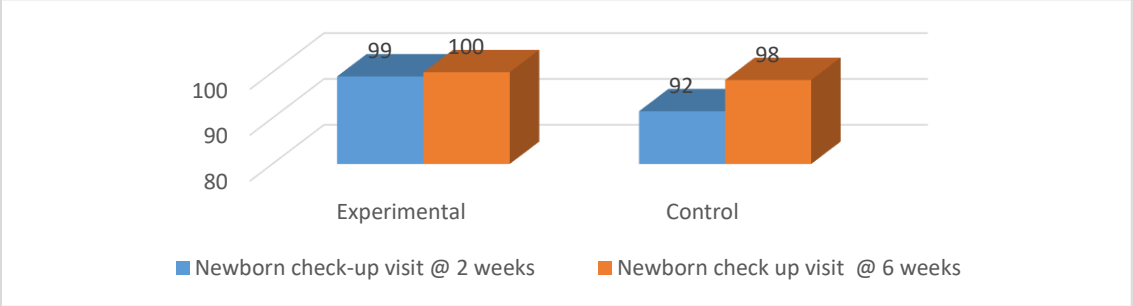


Figure 4.10: Comparison of attendance of newborn postnatal care contact at 2 and 6 weeks between the groups.

There was a statistically significant association between the adoption of two weeks newborn PNC contact ($\chi 2=7.6$,df=1, p=0.006) and study arm , while at six weeks, there was no statistically significant association ($\chi 2=2$, df=1, p=0.158). (See table 4.12)

Table 4.12: Effect of the intervention on utilization of newborn postnatal care contact at 2 and 6 weeks

Group	n	Chi-square	df.	p-value
2 weeks visit				
Experimental	117	7.6	1	0.006
Control	118			
6 weeks visit				
Experimental	117	2.0	1	0.158
Control	118			

***n- number, std. dev- standard deviation**

Logistic regression was performed to determine the effect of the intervention adjusted for covariates on the adoption of newborn PNC contact at two (2) and six (6) weeks. There was no significant difference at two weeks (OR=0.95, p=0.98, 95% CI=0.017-51.98) nor at six weeks (OR=0.00, p=0.996, 95% CI=0.00-0.00). The chances were the same in both groups.

Table 4.13: Effect of the intervention on adoption of two- and six-weeks newborn postnatal care contacts

	Pseudo R^2	OR	p-value	CI(95%)
Adoption of 2 weeks contact for the newborn				
Experimental (n=117)	⁑0.62	0.95	0.98	[0.017-51.98]
Control (n=118)				
Adoption of 6 weeks contact for the newborn				
Experimental (n=117)	⁑1.0	0.00	0.996	[0.00-0.00]
Control (n=118)				

***n- number, ⁑ Pseudo square,*β* standardized coefficient, CI confidence Interval**

4.3.5.2 Attendance of mothers' postnatal care contact at two weeks and six weeks

The study sought to establish the effect of the intervention on mothers' attendance of PNC contact at 2 weeks and 6 weeks postpartum. At two weeks and six weeks 86% (n=102) and 78.6%, (n=92) of the respondents respectively in the experimental group reported attending routine check-up compared to 61% (n=72) and 78.8% (n=93) respectively for the control group. The attendance at six six-week contact was almost equal in both groups (78.8% in the control and 78.6% in the experimental group). (See Figure 4.11)

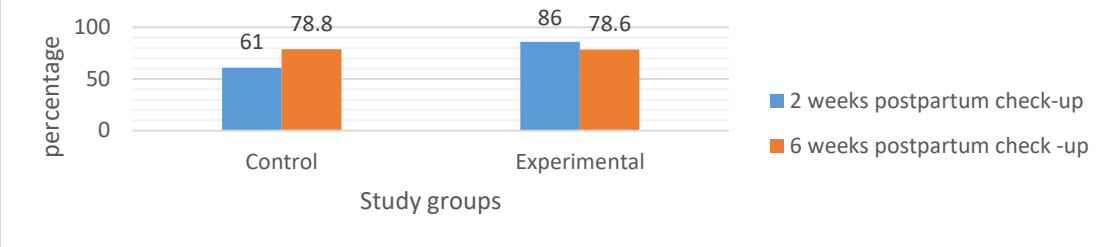


Figure 4.11: Attendance of mothers' postnatal care contact at 2 and 6 weeks among the groups.

A Pearson Chi-square test between the two groups showed there was an association of the adoption of the two weeks PNC contact and being in the control or experimental group ($\chi 2$=20.9, df=1, p=0.000) with no statistically significant association ($\chi 2$=0.00, df=1,p=0.973) at six weeks.

Table 4.14: Comparison of attendance of postnatal care contacts for the mothers among the groups.

Group	**n**	**chi-square**	**df.**	**P-value**
2 weeks visit				
Experimental	117	20.9	1	p= 0.00
Control	118			
6 weeks visit				
Experimental	117	0.001	1	p= 0.973
Control	118			

***n- number, std. dev- standard deviation, df-degrees of freedom**

A logistic regression demonstrated that the PNE intervention had a significant prediction on two weeks postpartum contact (p=0.00, OR 4.64, 95% CI=1.93-11.19) where the mothers in the experimental group were 4.6 times more likely to adopt the visit compared to those in the control but no significant difference for the 6 weeks contact (p=0.69, OR =1.22, 95% CI 0.47 -3.13). (See Table 4.15)

Table 4.15: Effect of the intervention on the attendance of 2 and 6 weeks postnatal care contact for the mothers.

	Pseudo R^2	OR	p-value	CI (95%)
Adoption postnatal 2 weeks visit (mother)				
Experimental (n=117)	⁑0.18	4.64	**0.00***	[1.928-11.19]
Control (n=118)				
Adoption postnatal 6 weeks visit (mother)				
Experimental (n=117)	⁑0.13	1.22	0.69	[0.47-3.13]
Control (n=118)				

***n- number, ⁑ Pseudo R square, OR odds ratio, *P≤0.05, CI- confidence Interval**

4.3.6 Effect of post-discharge postnatal education intervention on the adoption of composite postnatal practices

The principle of proportionality was applied to calculate the fraction score for each of the eight components per respondent which was averaged into a composite score per respondent. There was a statistically significant difference (t=8.1, p=0.00) in composite PNPs between the experimental and control groups where the mean score was 0.9±0.08 among the experimental group versus 0.8±0.1 among the control group as per Table 4.16

Table 4.16**:** Comparison of adoption of the composite postnatal practices between the groups

Group	**n**	**mean**	**std. dev**	**Statistical test**
Experimental	117	0.9	0.08	t=8.1, p=0.00*
Control	118	0.8	0.10	

***n- number, std. dev- standard deviation,** *P≤0.05

A multiple regression analysis was calculated to isolate the effect of the PNE intervention adjusted for covariates and showed a sustained significant prediction (β=0.26, p=0.00), where 26% of the variance in the adoption of recommended PNPs was predicted by the intervention as shown in Table 4.17

Table 4.17: Effect of the intervention on composite postnatal practices.

	R^2	β	p
Adoption of composite PNPs			
Experimental (n=117)	0.137	0.260	**0.002***
Control (n=118)			

***n- number, R^2 R square, β standardized coefficient,** *P≤0.05

Hypothesis results for the adoption of postnatal practices

Compared to the control group, mothers in the intervention group had a statistically significantly enhanced adoption of the recommended PNPs controlling for covariates. Overall, the intervention was effective in improving the adoption of aggregate PNPs (β= 0.26, p=0.002). The null hypothesis was therefore rejected. On individual PNPs, the intervention had a positive effective on self-care practices (β= 0.385, p= 0.00) and 2 weeks postnatal contact for the mother (OR= 4.64, p=0.00) as shown in Table 4.18.

Table 4.18: Summary of the effect of postnatal education intervention on composite and individual postnatal practices.

Outcome variables	test statistic (multiple linear/logistic regression)	P-value
Composite postnatal practices	β= 0.26	**0.002***
MDS health-seeking	β =-0.107	0.31
NDS health-seeking	β =-.036	0.73
Self-care practices	β= 0.385	**0.00***
Baby-care practices	β =-0.002	0.98
2 weeks visit for the newborn	OR= 0.945	0.98
6 weeks visit for the newborn	OR =0.0	0.996
2 weeks PNC contact (mother)	OR= 4.64	**0.00***
6 weeks PNC contact (mother)	OR= 1.22	0.69

***P≤0.05, OR odds ratio, β beta coefficient**, ***P≤0.05**

The effect size of the intervention on the adoption of PNPs was large with a Hedges'g of 1.1 which is beyond Cohen's 0.8 mark for a large effect size (Cohen, 1992).

4.4 Influence of maternal self-efficacy on the adoption of recommended postnatal practices

The study sought to establish the influence of the MSE on the adoption of the recommended PNPs. The PMSE score significantly positively predicted the composite PNPs (β=0.10, p=0.02), emergency health seeking after experiencing an MDS (β=-0.19, p=0.02), adoption of self-care practices (β=0.38, p=0.00) PNC visit for the baby at two weeks (OR 1.06, p= 0.00, 95% CI=1.02-1.11) and PNC visit for the mother at two weeks (OR=1.03, p=0.012, 95% CI 1.0-1.06). The MPSE score had no significant prediction on the other outcomes as shown in Table 4.19.

Table 4.19: Relationship between PMSE score and the adoption of the recommended postnatal practices.

	Model	Regression Coefficients	
Postnatal practices	Pseudo R^2/R^2	β/OR	p-value
Composite postnatal practices	0.024	0.15	**0.02***
Emergency healthcare seeking after MDS incidence (n=151)	0.03	-0.19	**0.02***
Emergency healthcare seeking after NDS incidence (n=158)	0.004	-0.06	0.43
Self-care practices (n=235)	0.14	0.38	**0.00***
Baby care practices (n=235)	0.00	0.05	0.41
PN contact for the baby @ 2 wks (n=235)	⁑0.10	1.06 (OR)	**0.00***
PN contact for the baby @ 6 wks.(n=235)	⁑0.07	1.06 (OR)	0.18
PN contact for the mother @ 2 wks. (n=235)	⁑0.04	1.03 (OR)	**0.01***
PN contact for the mother @ 6 wks. (n=235)	⁑0.00	0.99 (OR)	0.92

***P≤0.05, OR odds ratio, β beta coefficient, ⁑ Pseudo R square**

4.5 The mediating role of maternal self-efficacy on the relationship between post-discharge postnatal education intervention and the adoption of recommended postnatal practices.

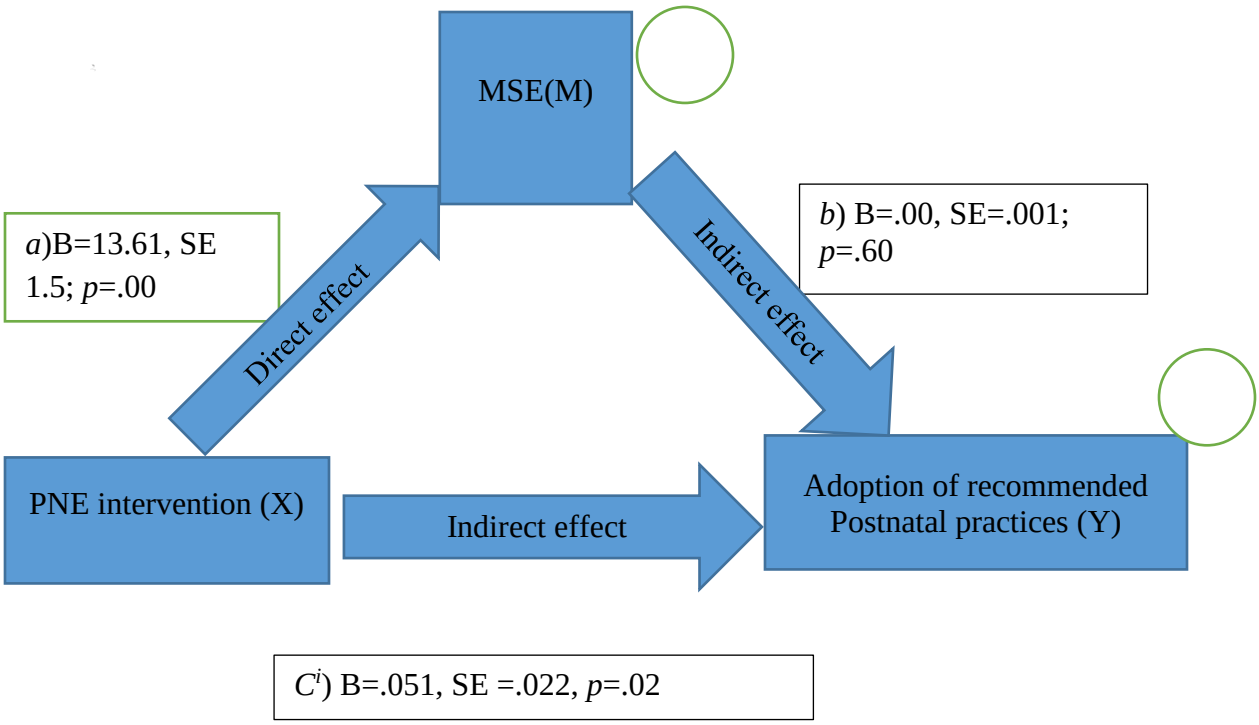
A path analysis was conducted to determine the mediating role of MSE between the PNE intervention and the adoption of the recommended PNPs. The direct and indirect effects between PNE intervention, MSE, and adoption PNPs were determined using two linear regressions as recommended by Kenny and Judd, 2014 (Agler & De Boeck, 2017). Three paths were estimated through a) Linear regression analysis estimating the direct effect between PNE intervention (adjusted for covariates) and MSE, b) and c^{i}) Multiple regression with the PNE intervention (adjusted for covariates) and MSE as predictors and adoption of the recommended PNPs as a dependent variable, estimating the indirect effect between PNE intervention and the adoption of PNPs through MSE. The results were as follows:

Model 1: Linear regression analysis to estimate the direct effect of PNE intervention and MSE demonstrated a statistically significant effect (Path *a*, B=13.61, SE 1.5; p =.00)

Model 2: Multiple linear regression showed the indirect effect between MSE and the adoption of PNP was not significant (path *b*, B=.00, SE=.001; p =.60). There was a statistically significant indirect effect (path c^{i} , B=.051, SE =.022, p =.02) between PNE intervention and adoption of the recommended PNPs. The point estimate of indirect effect was calculated using the product of coefficients method (i.e., product of weights *ab*, from X to M and M to Y) yielding *ab*=13.61 x0.00= 0. The study used the Sobel test which is a test that determines whether the indirect effect of the IV on the DV via the mediator is significantly different from zero by dividing αβ by the standard error.

This is then compared to a standard normal distribution to test for significance (Sobel, 1982). The *a* and *b* unstandardized coefficients and SE were imputed into the online Sobel Test calculator (Preacher J. Kristopher & Leonardelli J. Geoffrey, n.d.) which yielded non-significant results (Z=0, SE 0.14,p=1). Therefore, though MSE and PNPs were individually statistically significantly associated with PNE as seen in objectives 2 and 3, when the total effect of the model was considered, MSE was indirectly unrelated to PNP with an indirect effect of zero, implying that the intervention does not impact PNP through MSE. Thus, the MSE was not a mediator. See the path diagram in Figure 4.12.

Path diagram of a simple mediation model



Sobel test results (Z=0, SE=0.014, p=1)

Figure 4.12: Path diagram depicting the mediation effect of maternal self-efficacy between the intervention and the adoption of postnatal practices.

The FGDs' responses demonstrated a positive effect of the PNE on MSE and hence better practices. On maternal confidence (a marker of MSE) and dealing with doubt and anxiety, the respondents from the experimental expressed their appreciation of the PNE intervention.

"After the teachings when the CHP visited, it was a bit easy to take care of the baby", (respondent, E2,8). *(I confirm with the video if I'm doing the right thing when I am not sure),* (Respondent E1,8). *"Nilikua na wasiwasi mwanzoni* (I was not confident initially *but after the CHP visit and I read the papers I can tell when the baby is hungry and I can tell when the baby is sick. I can take care of the baby when he/she is crying, and I can bathe the baby",* (respondent, E1,7).

The respondents reported that the various materials were of help in improving their mental wellbeing.*"When I am stressed, I am able to deal with my mental stress…problems by talking to people, pia affirmations tulizopewa zimenisaidia. Najiambia mimi ni mama wa nguvu*!", (respondent E1,2). (The affirmations we were given were very helpful. I say to myself "I am a strong woman"). *"Niliweka chart na affirmations kwa ukuta karibu na kitanda. Nikilala nasoma. Ilinisaidia nilipojipata nikiwa chini*" (I pinned the chart and the affirmations on the wall near my bed. I would read before sleeping and it helped me when I felt low", (respondent, E 2,3). "*Video za danger signs zilinisaidia sana kujua nikiwa na shida" (*danger sign videos helped me to know when all was not okay), (respondent E1,1).

Some in the control group expressed a positive outlook.

"I am happy being called a mother and it makes me confident", (respondent C1,6).

"If I have enough breast *milk to take care of the baby and the baby is growing well, without any problem or sickness then I am happy and confident",* (respondent C2,8)

Figure 4.13: A picture of the educational wall hanging in a participant's house.

Some respondents expressed challenges. *"Ukiwa huna maziwa kama hauna chakula huwezi kuwa na raha au confidence"*, (respondent C1,7) (Without enough breast milk given no food, you cannot be happy or confident).

On the source of social support in new motherhood transition, most respondents singled out their mothers or parents, fathers of their babies, husbands, neighbours, and friends. Those in the experimental group also singled out the CHPs. *"I call my mother when I'm in doubt and this reassures me"*, (respondent C1). *"Motivation from my friends and family makes me feel confident" also "My parents supported me"*, (respondent E2,5)

Most of the respondents in the experiment arm expressed satisfaction with the follow-up care by the CHP's. *"I received support from CHP, they guided me on caring for myself",* (respondent E2,5). *"I got satisfied with the teachings and encouragement I got from CHPs especially when I was helpless*", (respondent, E1,8). Some respondents from the control arm said they were taught well by the health workers after delivery.

"Though time was short, the teachings were satisfactory", (*respondent*, C1,7). *"The health worker taught me how to keep the baby warm, clean the cord, dress and change the baby",* (respondent, C2,4). However, some respondents said they did not receive much pre-discharge education. *"La! Sikuonyeshwa jinsi ya kutunza mtoto..niliambiwa tu nioshe huku chini na nikalie chumvi nisioze"* (No, I was not taught how to take care of the baby. I was only told to take care of the perineum by sitting on salty water to avoid infection), (respondent C1,1)

Some mothers felt they would have needed more help on going home especially those in the control arm. "*No one taught me how to take care of the baby and myself after I was discharged*", (respondent, C1,7). "*Mtu akifika kwa nyumba na mtoto anachanganyikiwa sana…*" (when one gets home with a newborn you get mixed up, *someone to remind and hold your hand would be good*), (respondent, C2,6). "*Now that relatives cannot visit because of COVID and one feels alone. I wish I was visited by a nurse though I hear some community workers are supposed to see us". "Lakini watajua aje mtu amezaa?"* (How would they know one has given birth?), (respondent C1,4). This may point to a lack of linkage to CHPs in non-intervention areas.

Other respondents mentioned healthcare barriers. *"Going to the facility when I fell sick then being told the drugs are not there and that I should go back some other time made me so angry"*, (respondent C1,7) *"Some nurses were rude so sikuskiza vile walikua wanasema",* (I did not listen to them because they were shouting), (respondent C2,3)

Diverse methods of content delivery were appreciated. Different mothers highlighted different methods when asked what seemed to work best. *"CHP,..mmm.. taught me a lot, I asked questions and she showed me many things"*, (respondent E2,7*) "CHP explained the video on danger signs and how to care for myself and the baby"*, (respondent E1,5) *"For me, the videos were the best as they taught us how to wash the baby and also taught us everything we needed to know. I learned how to encourage myself",* (respondent E2,8)*". "Pamphlets, were very important as they boosted my confidence and helped me release stress"*, (respondent E1,5)

The study was conducted at the height of COVID-19 in 2020-2021. Though this was an unforeseen occurrence, some associated challenges were mentioned. For instance, loss of livelihood affected the ability to afford food and basic commodities. "*Maisha imekua ngumu na COVID. Kupata kibarua ni ngumu so sina diaper or food hata kama naambiwa nikule mara mingi,"* (Life is hard during COVID-19, getting a job is hard and I have no food or diaper even though I am being advised to eat more), (respondent, C2,3)

The effect of COVID-19 restrictions on social connectedness was expressed as mothers felt that it denied them the much-needed traditional visits. *"Lockdown affected visitors. Furaha ya mama nikutembelewa",* (a mother's joy is being visited after birth), (respondent E2,4) Some respondents were separated from their loved ones for long.*"Stress tupu! Sikua na mtu wakunisaidia kwa sababu sina bwana na mamangu hangekuja kutoka ushago kwasababu ya* COVID", (I was stressed for I had no one to help me, I am unmarried, and my mum could not come due to COVID-19 restrictions), (respondent, C1,5)

However, school closure and loss of jobs worked to the advantage of some new mothers as they got more social support. *"I have had a lot of family support as most of them are not working due to Covid-19"*, (respondent C1,7). COVID-19 also affected delivery of health services. *"I feared going to the clinic due to COVID and when I went, there was lack of drugs in the facility yet elsewhere I could not afford them"*, (respondent E2,8) *"Hata kama clinic ilifunguliwa mimi sikutaka kwenda. Niliogopa"*, (though health services clinic was open I didn't want to go. I feared*)*, (respondent E1,1)

In summary, mothers in the experimental arm expressed appreciation for the follow-up. The respondents raised the need for follow-up at home by CHP or health-care providers in early postpartum for teaching and guidance as well as self-help or self-care materials for baby and self, longer hospital stay to rest learn, more practice and enhancement of community health referrals.

"Tunahitaji kufunzwa na muuguzi after discharge kwasababu hatuwezi kumbuka vile tulifunzwa hosi juu ya mawazo". (there is a need for post-discharge visits by HW's because we cannot remember the teaching and guidance received in the health facility), (respondent C1,3. "*We need self-help materials on baby care and sickness signs. Sometimes we don't know what is serious and what is not*", (respondent C2,5). Some of the respondents expressed their dissatisfaction with LOHS. "*Nilizaa usiku na nilienda nyumbani asubuhi. Sikushika kila kitu walisema"* (respondent. C1,5) (I gave birth at night and went home the following day; I did not understand everything they said. I didn't get time to rest..there was no one to help me at home. I was stressed),

CHAPTER 5: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the study considering the objectives of the research. The study's conclusion and recommendations are also presented.

5.2 Discussion

There has been a disquiet not only on the neglect of PNC but also on the paucity of interventions in SSA to improve PNC and their ineffectiveness (Camara et al., 2021). By testing a multi-modal PNE intervention on MSE and the adoption of WHO's recommended PNPs, this study contributes to the knowledge gap on improving contextualized post-discharge support during the postnatal period for low-income primipara-newborn dyads.

5.2.1 Effect of post-discharge postnatal education intervention on maternal self-efficacy

The role of the mothers' MSE in maternal and newborn health cannot be overemphasized. In this study, follow-up PNE intervention was a significant positive predictor of MSE in the intervention group demonstrating that post-discharge follow-up PNE enhances MSE. Due to the paucity of SSA studies, we compared the results to similar studies globally.

Just as the current study demonstrated, a review of parent education interventions aimed at enhancing PSE found them to be significantly protective and enhance PSE among first-time parents, facilitating a smooth transition into parenthood (Liyana Amin et al., 2018). One such follow-up study in Singapore found a technology-based supportive educational parenting program to improve MPSE in the postnatal period (Shorey et al., 2019).

Three other postnatal follow-up studies in Iran demonstrated that postnatal counselling with skills training improved MSE, infant-care behaviors, and the health of the dyad (Karami et al., 2020) and that home-based quasi-experimental follow-up empowerment training by nurses reduced parenting stress and transitioning difficulties such as maternal concerns, changes in life, negative postpartum feelings, and improved enjoyment (Chegini et al., 2021), potentially enhancing MSE. The third one which was quite similar to our study showed improved primiparas PMSE in neonatal care after multi-pronged postnatal home-based education intervention. They used midwives for home visits for one-on-one didactic neonatal care training, phone access for questions, and neonatal care educational video (Koochakzai et al., 2018). The difference with our study was that we used CHPs.

The use of midwives for postnatal follow-up in low-resource settings such as our study setting may not be feasible where in such cases, WHO recommends that trained CHPs suffice for home visits (WHO, 2022). The CHPs in our study had been taken through rigorous training on the components of the intervention which ensured effectiveness. The respondents in our study were especially appreciative of their home visits in early postpartum. The notion that they were not alone but could call the CHPs anytime possibly enhanced their perceived social support and reduced their worries thus enhancing MSE. This demonstrates that home visits are especially impactful in improving MSE among primiparas in low-income settings. Indeed, evidence indicates that young, socio-economically disadvantaged mothers appreciate health visits by professionals as they assist them with recognizing and addressing their needs which can build their agency and thus improve MSE (Buchanan & Jardine, 2020).

The interventions above though using diverse modalities yielded similar effects with our study as they focused on the mothers' post-discharge informational and skills reinforcement. This is very helpful given that mothers play a major caregiving role and maternal knowledge and MSE are key predictors of a woman's successful transition into motherhood.

The aptness of our intervention period -6 weeks- which covers the entire postnatal period is supported by the review by Liyana Amin et al.,2018, who found that 2-15 weeks long interventions provided the needed time and education to develop essential skills for the new parents, thus improving MPSE. Our multi-modal 6-week-long study results affirm that home-based self-efficacy theory-based PNE intervention improves MSE postnatally.

5.2.3 Influence of maternal self-efficacy on the adoption of postnatal practices

In this study MSE was found to positively influence the adoption of composite PNPs; and specifically, self-care practices, and PNC contact for the dyad at two weeks. Though we could not find comparative studies with composed PNPs like in the current study, several studies demonstrate that MSE is positively associated with various postnatal outcomes.

The positive association between MSE and self-care practices in our study is consistent with other studies. One study in Iran found that a nurse-led postpartum self-care program increased knowledge, self-efficacy, and consequently self-care behavior (Khatun et al., 2021). This confirms that individuals with higher self-efficacy are more motivated to practice self-care behaviors regardless of any barriers (Motlagh et al., 2019). Our follow-up intervention enhanced MSE and self-care practices too among low-income primiparas.

Though our study did not demonstrate a correlation between MSE and baby-care practices, several studies demonstrate that indeed a higher MSE improves baby-care practices. For instance, a study in the US found that higher PSE improved maternal psychological well-being, thereby increasing confidence concerning baby care (Vance et al., 2020). A recent study in Nigeria too demonstrated that maternal education and MSE are essential factors for improving preventive care practices thus reducing adverse childhood outcomes for mothers with high perceived vulnerability (Akintunde, 2023) such as those studied in the current study. In our study, the baby care practices indicators were self-reported from prompted recall and that might have led to desirability or recall bias thus no significant difference calling for a more robust study design. It may also be that baby-care practices are routinely emphasized thus not responsive to the intervention if the control group was also sufficiently informed.

In the current study, the PNE intervention successfully enhanced MSE and predicted the adoption of PNC contacts demonstrated by the positive correlation between MSE and PNC visits for the dyad at 2 weeks. This is consistent with a systematic review on the use of a variety of Mhealth including phone and SMS reminders to strengthen PNC which showed that higher MSE increased postnatal women's ability to follow recommended PNC practices, such as attending scheduled PNC appointments (Mbuthia et al., 2019). In contrast, however, a study among vulnerable, low-income mothers in the Netherlands showed that low PSE was associated with higher uptake of postpartum care. The mothers sought more care from home-based maternity care assistants who offered tailored information and skills support thus increasing MSE (Laureij et al., 2021).

Although this review focused on rural areas, the barriers to care highlighted such as affordability and lack of knowledge are also common in Nairobi slums. The setting of postpartum care in the study was home-based and thus the women with low MSE sought more attention from the maternity care assistants. This would likely play out differently if the care was facility-based thus requiring the mother's effort to seek health away from home. In such a case higher MSE would likely support uptake of PNC contacts. We should nevertheless incorporate simple M-health solutions such as SMS reminders into routine PNC to increase primiparas knowledge and MSE, hence PNC contact attendance.

Interestingly, MSE was inversely related to emergency health-seeking after MDS suggesting that higher MSE may have prevented unwarranted health-seeking. This may be associated with reduced anxiety levels among mothers who get followed up (Bora Güneş et al., 2023) which enables the mothers to be more logical avoiding false alarms. This needs further interrogation to mitigate failure to seek care when necessary.

Overall, MSE was positively correlated with the composite PNPs for the primiparas. This agrees with other studies. A study in Iran demonstrated that MSE is associated with improved primiparas' maternal competency during the postnatal period (Bagherinia et al., 2018) which sets a foundation for the adoption of health-promoting behaviors. Another study in Singapore demonstrated that high MSE is associated with primiparas outcomes such as parental bonding, perceived social support, and parental satisfaction, and reduces PPD and anxiety(Shorey et al., 2019). Given the foregoing and the lack of experience among primiparas, enhancement of their MSE is key for their postnatal outcomes.

5.2.4 Effect of post-discharge postnatal education intervention on the adoption of recommended postnatal practices

Though this study had the adoption of recommended PNPs as a composite variable, the adoption of individual components was also interrogated to mitigate the risk of information loss occasioned by composing and to allow comparison with other studies. The resultant multiple maternal and newborn practices hence provided wider information. This was a strength because as Subramanian et al., 2020 contend, most PNE programmes in LMICs focus on one outcome especially EBF, yet it is more cost-effective to cover a variety of evidence-based practices (Subramanian et al., 2020). The eight components are discussed.

The first component was the health-seeking after NDS where though not statistically significant, almost all the primiparas in the study reported to have sought emergency health care for their babies after NDSs. This was better than in Ethiopia where only 60.5% of the mothers whose babies developed NDS sought health care immediately (Bulto et al., 2019). Contrary to our study, the study in Ethiopia reported that those who had PNC follow-up had better knowledge and subsequently better health-seeking behavior.

It may be that in our study both control and experimental groups had sufficient routine information on the identification of NDSs and the need to seek immediate care thus the intervention did not make any significant difference. The high health-seeking rates in both groups demonstrate the benefits of routine counseling and education for low-income first-time mothers. Indeed primiparas highlight baby care knowledge, early detection, and management of signs of illnesses as good for their babies' health (Nan et al., 2020), and thus a crucial element to focus on during the postnatal period.

In this study, the intervention had an inverse effect on health-seeking. This agrees with a study in Nigeria that demonstrated that home visits improve upstream maternal risk factors, improving maternal outcomes without increasing the use of health services in Nigeria (Cockcroft et al., 2019). The intervention especially the videos might have improved the accurate identification of danger signs preventing unwarranted outpatient visits. It may also be because the primiparas in the experimental group had access to the CHPs with studies showing that such follow-up reduces maternal anxiety (Bora Güneş et al., 2023). This agrees with the observation that home visits by CHPs reduce unnecessary hospital visits even for other conditions. For example, one study concluded that home visits by CHPs reduce rehospitalizations, and hospital visits, in minority patients with heart failure and thus save costs of health care use and improve outcomes (Vohra et al., 2020).

Conversely, a study in Afghanistan showed an increase in postnatal care-seeking for maternal complications after CHP's home visits (Edmond et al., 2018). Their study was population-based in a fragile and conflicted area thus more amenable to intervention. Of concern in the current study is that fewer respondents saw the need to seek healthcare for signs of PPD with some preferring talking to their significant others or waiting out the low mood. This is congruent with a study in Nigeria where only 39.5% of mothers with depressive symptoms sought care owing to a low perception of the need for mental healthcare, believing they would self-resolve, and fear of being stigmatized as a "weak mother" (Odufuwa et al., 2022). This points to a need to sensitize mothers on PPD.

In this study, baby care practices were not significantly different in the groups with almost all taking their babies for the six weeks immunization, practicing EBF, cord care, keeping the baby warm, and lying the baby on the side. This is congruent with a study in Afghanistan which showed no improvement in newborn care practices after CHP home visits (Edmond et al., 2018), and so did a scoping review of parent-targeted PNE which showed low impact on new-born outcomes (Dol, Campbell-Yeo, et al., 2019).

This may be related to routine PNC emphasis on baby care thus not amenable to intervention. It may also be that the increase in maternal knowledge did not necessarily increase the primiparas adoption of baby care practices. This was the case in a study on the use of nutritional educational videos in Nairobi slums which showed that increase in knowledge does not always translate to the adoption of practices.(Kiprono Patricia Jebet et al., 2023). This calls for more studies to justify generalization.

The findings were however contrary to a study in India which showed that respondents who got topic-specific PNE practiced those newborn care practices more (Subramanian et al., 2020). The self-reported, prompted recall of baby care practices in the current study may have been subject to desirability bias thus no difference in the groups. Similar unprompted studies have demonstrated effectiveness with a systematic review by Tiruneh et al., 2019 concluding that community mobilization efforts and home visits by CHPs to promote neonatal care practices are linked to decreased neonatal mortality, increased EBF, and are cost-effective in enhancing newborn health outcomes in LMICs (Tiruneh et al., 2019). This justifies the promotion of home-based PNE including home visits by CHPs.

Our intervention was a positive predictor of self-care practices. This is congruent with a study in Iran which demonstrated that an early self-care-based education program is effective for primiparas' outcomes including self-evaluation and maternal adaptation (Chamangasht et al., 2021). Though their study outcomes were different, the effectiveness of both studies may be because they were home-based interventions, initiated early postpartum when primiparas require support and guidance to adopt self-care practices. Their methodology was also a multi-modal approach with 3 individualized face-to-face education sessions in the first 3 weeks postpartum, a reinforcing information booklet, text messages, telephone calls for questions, and a group session (Chamangasht et al., 2021) thus creating a variety of PNE reinforcement just like in our study. One other quasi-experimental study in Nigeria with similar effectiveness as our study focused on a singular practice showing that women who received perineal wound care teaching practiced the same, leading to better wound healing (Ari et al., 2019). This study just like our study demonstrates that reinforcing maternal knowledge of specific self-care practices has the potential to improve their practice thus better maternal health outcomes.

Our literature review did not yield substantial studies on maternal self-care exposing a gap in this crucial aspect of PNC. This paucity was in tandem with a recent study that identified gaps not only in maternal self-care discharge education but also in its suboptimal attention from researchers(McCarter et al., 2022). The gap in attention in discharge education contributes to mothers' neglect of self-care. Indeed according to a recent review, women typically overlook their own self-care needs in the early postpartum period in favor of attending to the needs of their babies. (Lambermon et al., 2020).

We therefore consider it a strength to have focused on maternal self-care and belief that our findings can help bring this important aspect of PNC to the fore. We echo the assertion by Lambermon et al., (2020) that mothers require individualized self-care because their needs go beyond physical and include emotional health. Reinforcing primiparas self-care knowledge and skills has the potential to address these needs.

On uptake of PNC contacts, the intervention was neither a significant predictor of the newborn's 2- nor 6-week visit. More emphasis on routine check-ups of the baby may make the indicator less amenable to the intervention. This is congruent to a study in Oman that showed that HCWs scheduled and emphasized on the two weeks review for the baby and not the mother, then for the dyad at six weeks (Al Hadi et al., 2023).

In this study, the intervention was a positive predictor of the mother's visit at two weeks, but not at six weeks. Although most respondents from both arms reported not being scheduled for PNC contact at two weeks, the experimental group had a significantly higher uptake, presumably due to the SMS and call reminders. Indeed, research affirms that SMS and telephone call reminders increase the uptake of PNC visits in developing countries (Kebede et al., 2019). Our results are also congruent with a recent study that demonstrated an improvement in knowledge level and uptake of PNC check-ups during the postnatal period for the dyad after a digital health SMS intervention in Mathare and Kawangware slums (Ochieng' et al., 2024). Although the study utilized only SMS prompts, the impact of the post-discharge follow-up yielded better adoption of PNC contacts for mothers living in the slums just like in our study.

Comparable uptake of six weeks contact in both groups could be attributable to routine emphasis on the dyad's visit for the baby's immunization and the mother's family planning, thus not quite amenable to intervention. Indeed research shows that HCWs emphasize more on the six weeks contact for the mothers (Al Hadi et al., 2023).

A study in Tanzania for instance observed that in addition to inadequate knowledge of PNC services and postpartum difficulties, failure to schedule women for PNC contact before six weeks was the greatest hindrance to uptake (Konje et al., 2021). A study among HCWs in Oman concluded that the non-scheduling of two-week contact portrays the contact as optional or non-essential(Al Hadi et al., 2023). Shortage of healthcare workers against heavy workload has been cited as a hindrance for the 2-week contact in the low resource settings (Al Hadi et al., 2023; Konje et al., 2021). This underscores the need to resource PNC and come up with innovative ways to mitigate its non-prioritization such as follow-up interventions. Indeed , HCWs suggest house visits and telephone follow-ups instead of facility visits (Al Hadi et al., 2023). These home-based alternatives can help alleviate the gaps.

In a nutshell, the self-efficacy theory-based follow-up PNE intervention was a positive predictor of the adoption of composite recommended PNPs. The boosted knowledge and skills support at home, affirmation, verbal feedback, and guidance received irrefutably enhanced MSE in the intervention group and the adoption of PNPs. Overall, primiparas who received the intervention expressed more satisfaction with the post-discharge support provided. This agrees with an observation in Iran that self-efficacy theory-based education interventions are effective in improving primiparas' outcomes (Gandomi et al., 2022).

The better outcomes in our study may be attributed to the positive effect of the study's multi-modal approach that incorporated educational home visits by CHPs, follow-ups through phone calls, access to videos on danger signs, self, and baby care practices, a PNE wall hanging to reinforce key messages and affirmation pamphlets. This is in tandem with other studies. A scoping review of parent-targeted education found positive changes in parents' outcomes using a combined approach (Dol, Campbell-Yeo, et al., 2019) while yet another review favoured programs that combine experiential focus and individualized sessions with a wide array of content delivery methods including videos, activities, didactic teaching, printed, and so on (McKee et al., 2019). Our study demonstrates that a multi-modality approach works and highlights the need to supplement routine care with follow-up home-based self-efficacy theory-based PNE programs.

One outstanding mode of delivery was tasking the CHPs to "*adopt a primi*" , visit and follow her up until six weeks. Indeed, the primiparas singled out the CHP visit for didactic teaching and follow-up as the most valued aspect of the intervention. This supports the WHO's recognition of CHPs as key players in improving maternal health indicators in low-resource settings in its guidelines(WHO, 2022). It also supports the need to strengthen the community health strategy, thus entrenching home-based PNC follow-up for primiparas living in harsh informal settlements who are likely to have low social support.

This is in tandem with the appreciation of disadvantaged young mothers in the UK who stated that home visits by professionals assisted them with recognizing and addressing their needs (Buchanan & Jardine, 2020).

Furthermore, a review of studies that demonstrate that home visits improve numerous postnatal outcomes such as depression scores, EBF rates, infant healthcare utilization, and maternal satisfaction(Yonemoto et al., 2021). Indeed at least one early home visit is highlighted as an impactful evidence-based intervention for maternal and neonatal health in WHO postnatal recommendations (WHO, 2022). We therefore consider the early postpartum home visit a strength in our study.

This study further included a significant other in the CHP didactic session where they were counseled on supporting and affirming the primiparas. Though some primiparas decried the absence of their preferred significant others occasioned by COVID-19 restrictions, they appreciated the support from family and friends who were available. This is supported by Xiao et al., 2020 who contended that postpartum mothers appreciate and benefit from home visits especially if the sessions involve the entire family members who are influential as the caregivers or decision-makers (Xiao et al., 2020).

Further, for those mothers who had insufficient perceived support due to COVID-19 restrictions, the CHPs served a crucial role. This is congruent with a study among vulnerable women in the Netherlands which asserted that women with an absence of a supportive network perceive follow-up by maternity care assistants as their anchor during the early postpartum period.(Laureij et al., 2021).

In line with expanding PNC beyond coverage and survival to quality care, WHO calls for a positive postnatal experience which is defined as “one in which women, newborns, partners, parents, caregivers and families receive information, reassurance and support in a consistent manner from motivated health workers; where a resourced and flexible health system recognizes the needs of women and babies and respects their cultural context” (WHO, 2022). To achieve this, there is a need for knowledge translation to inform evidence-based content, methodology of delivery, and the right timing for effective PNE programming. This study contributes to this evidence as relates to low-income primiparas.

5.2.5 Mediating role of maternal self-efficacy on the relationship between the intervention and adoption of postnatal practices.

Although MSE is generally believed to mediate maternal knowledge and early parenting practices (Lee et al., 2018), MPSE in this study did not mediate the effect of the educational intervention on the adoption of PNPs. This is contrary to a study in Texas that demonstrated that PSE had a mediating effect between maternal health literacy and early parenting practices among poor and underserved mothers (Lee et al., 2018). This could be because in the current study, actual maternal knowledge was not measured as a process indicator but rather, PNE intervention was the independent variable as it is expected to positively influence knowledge.

This demonstrates that MSE must not always mediate knowledge. In this study, the intervention may have been effective in enhancing the adoption of recommended PNPs without necessarily being affected by MSE. A more robust study design such as RCT and pre-measurement of maternal knowledge to have it in the path analysis model instead of the intervention.

5.3 Conclusion

This study provided sufficient evidence to support follow-up post-discharge PNE intervention to complement routine PNC. On objective one, the intervention improved low-income primiparas' MSE thus the first null hypothesis was rejected. On the second objective, the intervention improved the adoption of composite PNPs among low-income primiparas thus the second null hypothesis was rejected. More specifically, the study improved the mothers' adoption of self-care practices and PNC contact at two weeks. Additionally, on objective three, MSE positively influenced the adoption of recommended PNPs; more specifically self-care practices and PNC contact at two weeks for the dyad. This demonstrated that incorporating MSE-enhancing aspects in PNC programming has the potential to improve the adoption of recommended PNPs.

There was an inverse relationship between MSE and emergency health seeking for MDSs which may have suggested that follow-up PNE has the potential to reduce unnecessary health-care visits. Although this may reduce healthcare costs, it needs to be examined with caution to ensure that primiparas seek care when they experience MDSs or NDSs. Primiparas appreciated multi-pronged sources of information, especially the educational home visits by the CHPs in early postpartum, thus an increased level of satisfaction with post-discharge PNE. Finally, on objective four, the MSE did not mediate the effect of the intervention and adoption of PNCPs.

5.4 Recommendations

5.4.1 Recommendations from the study.

1. The MoH and relevant stakeholders should implement MSE-enhancing multipronged follow-up post-discharge PNE as part of their routine care for primiparas.

2. Nairobi County and Maternal health partners should support CHPs for early postnatal follow-up in the slums given their effectiveness in supportive PNC in such settings.

3. The academia should advocate for the translation of knowledge to effective programming and in this case, advocate for supportive post-discharge PNE programs.

5.4.2 Recommendation for Policy

1. The MoH and other maternal and newborn health stakeholders should allocate and ring-fence resources for follow-up home-based PNE through the community health strategy, prioritize appropriate content, and identify the most impactful mode of delivery and optimal timing.

5.4.3 Recommendations for further research

1. Research on the effect of the PNE intervention on primiparas who stay longer in hospital and those who have complicated births who may also benefit from follow-up PNE.

2. Replications of the study in different informal settlements preferably using an RCT may help ascertain generalizability.

3. A cost benefit analysis of follow-up PNE on new-born and maternal outcomes would be helpful considering competing reproductive health needs.

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APPENDICES

Appendix 1a: Consent form

Introduction

My name is Immaculate Wambui Kamau, a PhD Candidate at Kenyatta University's School of Health Sciences, pursuing a Doctor of Philosophy degree in Reproductive and Population Health. You were chosen randomly to take part in a study I am conducting as part of my degree programme entitled **"Effectiveness of a Post-Discharge Educational Intervention in Improving Postnatal Practices among First Time Mothers in Informal Settlements in Nairobi."**

Procedures to be followed.

As a first-time mother, I am urging you to take part in the intervention by allowing us to follow you up after you are discharged and then get your feedback after six weeks. I will need to know where you live and your telephone contact so that we can visit you at an agreed day and time. I will put the details you give me in a questionnaire.

Significance of the research

The study will inform the stakeholders in maternal, newborn and child health on workable innovative strategies that would improve maternal health practices and safe lives in the postnatal period. If it works, the intervention will propose policy changes that could improve the provision of post-discharge maternal education.

Benefits

Although there is no immediate benefit for you, the information you provide will be significant. You will have provided me with information that I will use to create a paper for my academic work.

Policy makers might utilize this data to enhance the delivery of postnatal education to first time mothers after discharge thus reduce morbidity and mortality of mothers and neonates.

Risks

There are no known dangers in participating in this study. However, some of the information sought is personal and may be uncomfortable. Note that the responses you give will not affect you as they will be kept private and confidential and will not be used against you.

Compensation

You will not receive any money or other form of payment for taking part in the study.

Confidentiality

Your contributions to this study's data collection will all remain confidential. Only the researcher will have access to the information. Information that can be used to identify you such as telephone number will remain confidential. On the form used to collect the data, your name will not be recorded. You will only be recognised by codes. The scripts will be kept safe and only the study team will have access to them.

Voluntarism

You have the right to quit participation at any time if you feel uncomfortable, and doing so will not have any negative effects on the services you receive from this facility or any other organisation in the future. You are not required to answer any questions you do not choose to answer. However, we will be able to better comprehend the effect of the intervention if you are honest in your responses to these questions.

Expected time of the study

This intervention will take approximately 6 weeks.

What happens to the information?

I will use all the data you give to create a report that will be turned in as a thesis at Kenyatta University's, School of Health Sciences. By contacting me on the number shown below, you can obtain a copy.

Contact information for the interviewer

You are welcome to get in touch with me, Immaculate Kamau, at 0722-653925 or immaculatemail@yahoo.com, or you can reach my supervisor, Dr. Eliphas Gitonga, at 0721-406609. You can also email the Kenyatta University Ethical Review Committee Secretariat at chairman.kuerc@ku.ac.ke or secretary.kuerc@ku.ac.ke if you have any queries concerning your rights as a study participant.

Do you have any further questions about the study now that I've explained it to you?

Participant's statement or Certificate of Consent

I understand the information mentioned above regarding my participation in the study. I was explained the study and the opportunity to ask questions, and my inquiries were satisfactorily addressed. It is totally up to me whether or not I take part in this study. I am aware that my data will be kept private and that I have the right to withdraw at any time. I am aware that regardless of whether I choose to withdraw from the study, I will continue to get the same level of treatment from the health facility today and from any other clinic at any other time.

Name of Participant: _____

_____ _____

Signature or Thumbprint Date

_____ _____

Name of Representative/Witness (where necessary) Relationship to Subject

Statement by the researcher/person taking consent

I did my best to ensure that the participant understood the information sheet after I accurately read it to her. I certify that the participant had a chance to ask questions about the study, and that I have answered all of those questions truthfully and to the best of my ability. I attest that the person's consent was freely provided and voluntarily given, and that it was not forced upon them.

A copy of this Informed Consent Form has been provided to the participant.

Name of research assistant ----------Signature----------

Name of participant ---------- Signature----------

Date --------/-------/-------Day/month/year

Appendix 1b : Fomu ya idhini

Utangulizi

Jina langu ni Immaculate Wambui Kamau, mwanafunzi wa PhD nasomea digrii ya Daktari wa Falsafa katika afya ya Uzazi katika Shule ya Afya ya Umma, Chuo Kikuu cha Kenyatta. Kama sehemu ya mpango wangu wa shahada ya kwanza, ninafanya utafiti ndani ya makazi duni jijini Nairobi ili kubaini ufanisi wa elimu na ushauri wa mama baada ya kujifungua juu ya mazoea na utekelezaji wa tabia za kukuza na kuimarisha afya ya mama na mtoto mchanga. ulichaguliwa kwa bahati nasibu kushiriki. Ningependa kukuomba ushiriki katika utafiti lakini kabla ya kuamua kuhusika au kukataa kushiriki, ningependa kukuelezea kile utafiti unajumuisha.

Umuhimu wa utafiti
Utafiti huo utawajulisha wadau katika afya ya mama na mtoto juu ya mikakati ya ubunifu inayoweza kuboreshwa ambayo itaboresha mazoea ya afya ya mama na maisha salama katika kipindi cha ujauzito. Ikiwa inafanya kazi, uingiliaji huo utapendekeza mabadiliko ya sera ambayo inaweza rekebisha utoaji bora wa elimu ya baada ya kujifungua.

Faida
Hamna faida za kibinafsi kwako lakini habari unayotoa itakuwa muhimu. Nitatumia habari unayonipa kuandika karatasi kwa kazi yangu ya masomo. Habari hii inaweza kuboresha sera za utoaji wa elimu ya baada ya kuzaa kwa mama baada ya kutoka hospitalini. Hii itafaidi afya ya mama na mtoto mchanga na kupunguza hali ya magonjwa na vifo .

Hatari
Hakuna hatari zinazohusika katika kushiriki katika utafiti huu. Hatari tu inaweza kuwa kwamba baadhi ya habari inayotafutwa ni ya kibinafsi. Walakini, majibu unayopeana hayatakuwa ya siri na hayatatumika dhidi yako. Habari unayotoa haitakuathiri kwa njia yoyote.

Mchango wako katika utafiti
Ninakukaribisha wewe kama mama kushiriki katika kuingilia kati kwa kuturuhusu kukufuata, kukupa habari zaidi, ushauri, msaada, ushauri nasaha .

Fidia
Hautapokea pesa au fidia yoyote ya kushiriki.

Usiri
Habari zote unazopeana na utafiti huu zitahifadhiwa siri. Habari itakua tu na mtafiti. Mahojiano hayajulikani kabisa na habari ambayo inaweza kukutambua inabaki kuwa ya siri. Jina lako halitaonekana mahali popote kwenye fomu ya ukusanyaji wa data. Nambari tu zitakazotumika kukutambulisha. Fomu za ukusanyaji wa data zilizojazwa zitahifadhiwa mahali salama imefungwa na mtu pekee wa kuzipata atakuwa mpelelezi wa utafiti na wasaidizi wa utafiti.

Kushiriki kwa hiari
Sio lazima kutoa jibu lolote kwa swali lolote ambalo hutaki kujibu. Pia na una uhuru wa kuacha kushiriki wakati wowote. Walakini, majibu yako yaaminifu kwa maswali haya yatatuwezesha kuelewa vyema mahitaji ya ushauri wa mama na kuwasaidia.

Wakati unaotarajiwa wa utafiti.
Utafiti huu utachukua takriban wiki sita.

Matokeo ya utafiti
Habari yote uliyotoa itatumika kuandika ripoti na itawasilishwa katika Chuo Kikuu cha Kenyatta, shule ya afya ya umma. Unaweza kuwasiliana nami kwenye anwani ifuatayo.

Mawasiliano
Immaculate Kamau kwa nambali 0722-653925 au Barua pepe: immaculatemail@yahoo.com
Baada ya maelezo yangu juu ya utafiti, una swali lolote?

Hati ya idhini
Nimesoma au nimeelezewa kuhusu utafiti huu na nimepewa nafasi ya kuuliza maswali na yamejibiwa vizuri. Kwa hivyo nakubali kwa kupenda kwangu kushiriki katika utafiti huu.

Jina la Mshiriki _____
Saini ya Mshiriki _____ Tarehe _____ / _____ / _____
Taarifa ya mtafiti / mtu anayechukua idhini
Nimesoma kwa usahihi jarida la mshiriki, na kwa uwezo wangu wote nimehakikisha kuwa ni wazi kwa mshiriki. Ninathibitisha kwamba mshiriki amepewa fursa ya kuuliza maswali na maswali yake ikajibiwa kwa usahihi uwezakanavyo. Ninathibitisha kwamba hajalazimishwa kutoa idhini.

Nakala ya fomu hii imepewa mshiriki.
Jina la mtafiti ---------- Sahihi --------- ----------
Jina la mshiriki ---------- Sahihi --------- ----------
Tarehe -------- / ------- / -------

Appendix 2: Entry data questionnaire

Questionnaire Serial number_____ Date____/____/2020
Mobile phone number (own) ./..../..../..../..../..../..../..../..../.....DSA/household no.....
Alternative mobile phone number (significant other)...../..../..../..../...../...../...../..../...../..../
RAs Name_____ Signature_____
Health facility Code_____
Facility type: private ( ) public( ) NGO/FBO( ) Facility level: tier 1( ) tier 2( ) tier 3( ).
Postnatal ward workload ratio_____
Start time_____ end time_____

Section 1: Socio- demographic Information

No.	Question	Coding	Category	
Q1	How old are you by the last birthday?			
Q2	What is your residence?	1	Korogocho	
		2	Huruma	
		3	Viwandani	
		4	Kwa Reuben	
Q3	What is your marital status	1	Single	
		2	Married	
		3	Widowed	
		4	Separated /divorced	
		5	Not specified	
Q4	What is your highest level of education?	1	No education/ informal education	
		2	Primary education uncompleted	
		3	Primary education completed	
		4	Secondary education uncompleted	
		5	Secondary education completed	
		6	College certificate/ diploma	
		7	Bachelor's degree	
		8	Post graduate	
Q5	What is your current occupation	1	Employed (formal)	
		2	Self employed	
		3	Casual job	
		4	Unemployed	
		5	Other Please specify.	
Q6	What is your approx.. monthly household income			

Section 2. Length of Hospital Stay and perceived satisfaction with in-hospital PNE

No.	Question		Coding category	Skip to
Q9	How long have you stayed in hospital since delivery?	1	6 hrs and below	
		2	7-12 hours	
		3	13-24 hours	
		4	25-48 hours	
Q10	How satisfied are you with the counseling/teaching during hospital stay and discharge?	1	Very satisfied	
		2	Satisfied	
		3	Neither Dissatisfied nor satisfied	
		4	Dissatisfied	
		5	Very dissatisfied	

Appendix 3: Exit questionnaire

Section 2: Adoption of recommended PNC practices after intervention

Part 1	**KNOWLEDGE AND PRACTICE FOR MATERNAL DANGER SIGNS**								
	a) What MDSs should one look out for after delivery? (*Do not read. Circle yes for all that are mentioned and circle no for those that are not mentioned)*					c) did you experience (*read out the symptoms*)			
	b) what action should you take after you notice *(read out the MDSs and put a tick for the right action and X for others*)					D) if yes what action did you take?			
		A) Identification		B) Action		C) have you experienced ?		D) Action	
	MDS for immediate healthcare seeking day or night	Yes	No	Go to healthcare center immediately	others	Yes	No	Went to the health center	Others
1	Sudden and profuse blood loss or persistent increased blood loss, faintness, dizziness(PPH)								
2	Headaches with visual disturbances, nausea, vomiting, feeling faint, and Convulsions or fits (preeclampsia/eclampsia)								
3	Fast or difficult breathing (pulmonary embolism)								
4	Fever and too weak , feeling sick with offensive vaginal discharge (puerperal sepsis),								
5	Calf- pain, redness or swelling with shortness of breath or chest pain (thromboembolism).								
6	problems urinating, or leaking or fecal incontinence (Obstetric Fistula)								
7	Extreme tiredness, light headedness, paleness (anemia)								
8	Severe sadness/hopelessness/ not wanting the baby, suicidal thoughts - idea, plan or attempt- (puerperal psychosis)								

		? / 8		?/8		x/8=z	?/z					
Part 2	**KNOWLEDGE AND PRACTICE FOR NEONATAL DANGER SIGNS**											
	What baby danger signs should one look out for and what action should one take ? (*Do not read. Circle yes for all that are mentioned and circle no for those that are not mentioned*)											
	NDSs requiring emergency treatment day or night	yes	No	go to healthcare center immediately	others	Have you experienced		Action taken				
						Yes	No	Visited health center	others			
1	Fast and or difficulty in breathing or indrawing, grunting or wheezing, looking blue around the mouth											
2	Convulsions											
3	fever- feels hot											
4	feels cold - poor body temperature control											
5	No spontaneous movement; baby Lethargic/floppy											
6	yellow eyes, palms and soles of feet											
7	Diarrhoea											
8	No feeding (is taking less than 8 feeds in 24 hours) or difficulty feeding (poor attachment, not suckling well)											
9	irritated cord with pus or blood, swelling											
10	swollen or pus coming from the eyes, ears or skin pustules											
	Total	x/10		x/10		x/10=z			x/z			

Part 3	**SELF CARE PRACTICES**					
	These questions are to assess the degree to which you took care of your health needs in the last 6 weeks. There is no right or wrong answers. I will read for you	always (4)	Very often (3)	sometimes (2)	rarely (1)	never (0)
1	I had someone nearby for the first 24 hours of discharge for support					
2	I had intake of greater amount, frequent , healthier balanced diet and enough water- (Maternal nutrition)					
3	I took a bath daily and washed my hands regularly; especially before and after caring for the baby,after using the toilet,After changing diapers, before and after cleaning my peuperium (personal hygiene).					
4	I got adequate rest and sleep and have avoided hard physical labour					
5	I frequently empty my bladder					
6	I regularly do Pelvic floor exercise					
7	I regularly engage in some physical exercise e.g walking					
8	I have avoided sexual, intercourse until the perineal wound heals, and I know the importance of condom use to prevent STI and HIV transmission					
9	I know the importance of birth spacing and I use/intend to use a family planning method .					
10	I ensure a conducive home environment for promoting the health of the baby and my recovery . For example, warmth, good ventilation and hygiene for both myself and baby.					
11	I and baby sleep under an insecticide-treated bednet.					
12	Whenever I have a problem I seek health care services					
13	I took iron and folic acid supplementation after birth					
		Out of 52				

Part 4	**BABY CARE KNOWLEDGE AND PRACTICE.**	Tick Correct answer (prompted)	
1	Exclusive breast feeding: How are you feeding your baby	Breast feeding exclusively	Others
2	Cord care:	Keeping cord dry by applying chlorhexidine ONLY daily for 7 days with clean hands.	Others
3	keeping the baby warm for ambient temperature: How have you kept the baby warm?	- two layers of clothes above adults and use of hats/caps	
4	How long after birth was the first baby bath	24 hours after birth	Others
5	How do you clean your baby	Bathing or wiping daily	Others
6	What position does your baby sleep?	his/her back or side.	Others
7	How many times and when have you taken the baby to be seen by a health worker on day 3 and between 7 and 14 days and 4-6 weeks after birth.	On day 3 and between 7 and 14 days and 4-6 weeks after birth.	Others
8	Have your baby been fully immunized at 6 weeks.	Yes (see card)	No
	Total score	/8	
part 5	**ATTENDANCE OF PNC CONTACT S**	Yes	No
	Did take the newborn to the facility for check-up 2 weeks		
	Did you take the newborn to the facility at 6 weeks		
	Did you go for your 2 weeks PNC visit		
	Did you go for your 6 weeks PNC visit		

Part 6	How satisfied are you with the counseling/teaching and support after hospital discharge?	1	Very satisfied
		2	Satisfied
		3	Neither Dissatisfied nor satisfied
		4	Dissatisfied
		5	Very dissatisfied

Appendix 4: Perceived Maternal Self-Efficacy scale

Instructions to parents

Below are questions that relate to how you and your baby interact. When answering a question please tick the response you feel best describes your perception of the situation or how you might feel even if you haven't experienced some of the tasks yet. i.e. Strongly Disagree; Disagree; Agree or Strongly Agree.

		Strongly disagree	Disagree	Agree	Strongly agree
1	I believe that I can tell when my baby is tired and needs to sleep.				
2	I believe that I have control over my baby's care.				
3	I can tell when my baby is sick.				
4	I can read my baby's cues.				
5	I can make my baby happy.				
6	I believe that my baby responds well to me.				
7	I believe that my baby and I have a good interaction with each other				
8	I can make my baby calm when he/ she has been crying.				
9	I am good at soothing my baby when he / she becomes upset.				
10	I am good at soothing my baby when he / she becomes fussy.				
11	I am good at soothing my baby when he / she continually cries.				
12	I am good at soothing my baby when he / she becomes more restless.				
13	I am good at understanding what my baby wants.				
14	I am good at getting my baby's attention.				
15	I am good at knowing what activities my baby does not enjoy.				
16	I am good at keeping my baby occupied.				
17	I am good at feeding my baby.				
18	I am good at changing my baby.				
19	I am good at bathing my baby.				
20	I can show affection to my baby.				

Source https://www.ncbi.nlm.nih.gov/books/NBK349665/bin/11-1015-09-pp5.pdf

Appendix 5: Focus Group Discussion guide

Question 1. How satisfied are you with the counseling/teaching that you have received since discharge?

Explain why

_____

_____

Question 2. What are the aspects that you are happy about regarding the care that you have received after discharge?

_____

_____

Question 3. What are some of the stressors and challenges that you have faced during postnatal period after discharge:

_____

_____

_____

Question 4: how would you rate your confidence as a mother and why?

.....

.....

Question 5: what factors prevent you from following the advice given by the healthcare providers.....

.....

Question 6: What is your suggestion regarding improvement of PNC after discharge:

Appendix 6: Counseling Guide for the CHP's

This session takes 60 minutes

05 minutes: Explore stressors and challenges of postnatal period: Ask the mother to share her experience post-discharge and raise any concerns or challenges they may have. This will enable building of rapport.

05 minutes: Introduce the support intervention: Discussion on MSE ; The CHP will discuss with the primiparas the importance of maternal confidence and how to improve it. The important thing here is to enhance the mother's self-confidence of parenting a newborn. Ask the participant what she anticipates will be challenging chores in caring for a newborn or for herself in the PP, and get her to participate in a brief problem-solving session where she can come up with solutions to the said barriers and challenges.
Let her participate. CHP to give personal experience, demonstrations and affirmation to enhance MSE and encourage family members to give social support

15 minutes: Interactive session with mothers ; The CHP will go through the contents on self-care and newborn care with the aid of the education pamphlet and answer mothers' queries if they arise. The CHP will go over the information on newborn care and self-care in reference to the wall hanging and respond to the participants questions as they come up.

20 minutes: demonstrate various aspects of newborn; Let her participate and demonstrate ; cleaning cord, baby, BF and correct mistakes immediately. Show the videos or demonstrations of other women like her successfully completing tasks. CHP to give personal experience, demonstrations and affirmation to enhance MSE and encourage family members to give social support.

10 Min: the CHP will answer any queries the mother might have

05 minutes; The CHP will offer helpful feedback on mothers' accomplishments on newborn and self-care, and will highlight the important aspects of the intervention for the first time mothers.

The content of the pamphlet is as follows:

1. **Knowledge of MDSs**

The mother should visit the health facility IMMEDIATELY if she experiences any of the following danger signs:

1) Heavy or increasing vaginal bleeding (PPH)
2) Convulsions or fits (eclampsia)
3) difficult breathing or fast breathing
4) feeling sickly, fever and weakness that keeps you in bed (puerperal sepsis),
5) Severe headache with swelling, blurred vision, fast or difficult breathing (pre-eclampsia)
6) "Calf- pain, redness or swelling; shortness of breath or chest pain" (DVT).

She should go to the health facility as soon as possible if she has ;

1) Swollen, engorged, painful breasts or nipples (breast feeding problem)

2) problems urinating, or leaking or fecal incontinence (Obstetric Fistula)
3) Smelling vaginal discharge
4) The perineum not healing, its painful or has an infection
5) Pain in the wound site, if swollen, red or having pus
6) Extreme tiredness, paleness (anemia)
7) Severe sadness/hopelessness/ not wanting the baby, suicidal thoughts - idea, plan or attempt- (puerperal psychosis)

2. Knowledge of NDSs.

The mother of family should go to the health facility for IMMEDIATE care if the baby shows these signs:

1) difficulty in indrawn breathing, grunting or wheezing, looking blue around the mouth
2) fits
3) diarhoea
4) fever- feels hot
5) feels cold - poor body temperature control.
6) bleeding
7) not feeding, poor sucking
8) yellowing of the palms and/or soles of the feet

"The mother and family should go to the health facility as soon as possible if they notice the following NDSs";

1) problems feeding (not attaching or suckling appropriately)
2) Baby having less than 8 feeds in 24 hours.
3) Skin pus filled pimples, eyes or ears being swollen or producing pus.
4) Swollen, red cord , producing pus or blood
5) Yellowing of the eyes or skin (jaundice).
6) If baby is Lethargic/floppy

3. Exclusive Breastfeeding knowledge and practice. Mothers to be advised on exclusive breastfeeding which is feeding of the baby with mother's breast milk only directly or expressed.

4. Baby care knowledge and practice. Advice mothers and family to:

1) Keep the baby warm with 1-2 layers above an adult including a cap if cold.
2) Umbilical cord care: Keep it dry , apply chloexedine and Do not apply anything else on the stump. Wash hands before cord care
3) The baby should always sleep on the side or back to avoid choking.
4) Keep the neonate clean. Although daily bathing is not required, you should wash the baby's face and bottom as needed. When dressing the baby, make sure the room is warm.
5) Have a review by health worker on day 3 and between 7 and 14 days and 4-6 weeks post-delivery. Ensure there is facility visit at 6th week for the baby to be immunized.
6) Protect the baby from smoke.
7) Do not expose the baby to the sun directly.

5. Self-care (entire family to be counseled by CHP and PNE materials)-

1) It is crucial that there is someone in close proximity with the mother for the initial 24 hours for support
2) Maternal nutrition- Intake of greater amount, frequent , healthier balanced diet, enough water- in context of local practices
3) Personal hygiene, Puerperium, hand washing
4) Adequate rest and sleep- avoid hard physical labour

5) Frequent empting of bladder
6) Pelvic floor exercise
7) Mild physical exercise e.g walk
8) Rest and sleep is crucial for recovery and the mother should avoid hard physical labour.
9) Use of condoms is essential to preventing the spread of STIs and HIV, and sexual activity should be avoided until the perineal wound has healed.
10) Emphasis the significance of birth spacing and advice on using family planning methods including Lactational Amenorrhoea Method (LAM).
11) Explain the significance of conducive home environment for enhancing mothers' 'health and recovery and babys' health. For instance, warmth, good ventilation, and hygiene for both mother and baby.
12) Where a mother and an infant reside in a malaria prone area, emphasise the need to use an insecticide-treated bed net.

6. The mother should be reminded by text to attend PNC contact at two weeks and at six weeks. The message should be as follows:

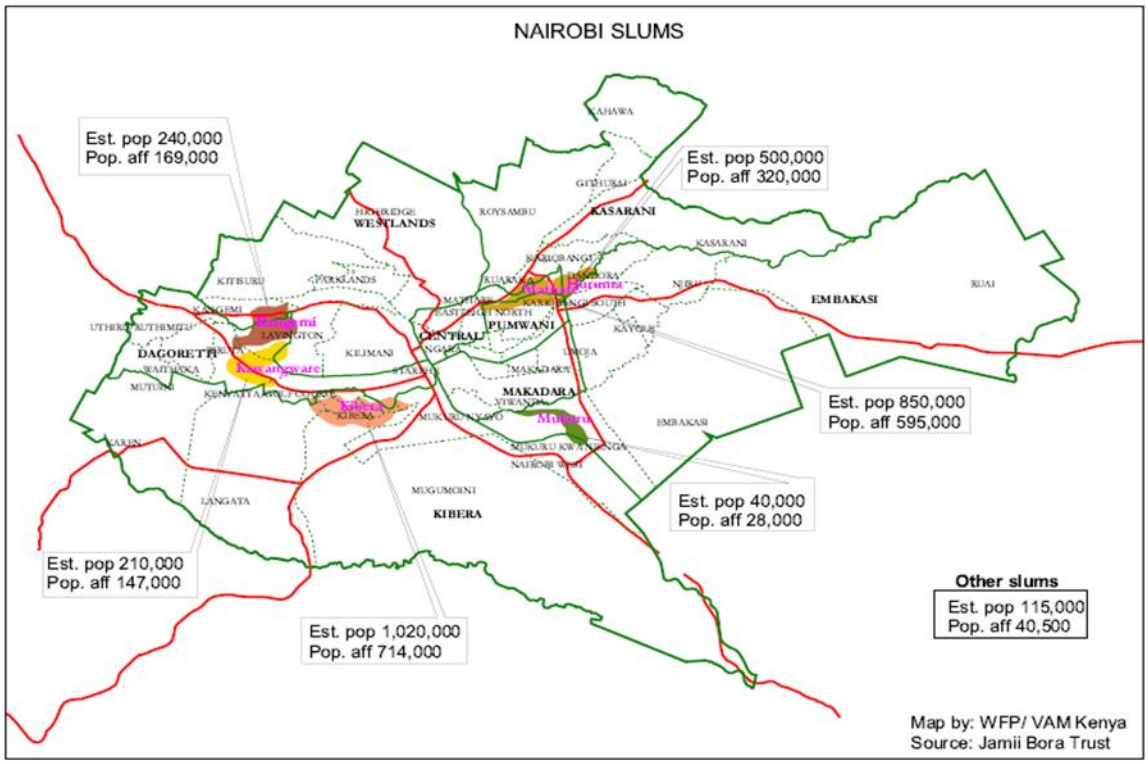
English Version

How are you....., name..... This is CHP.....
reminding you to go for post-natal visit on the appointment date on your card.
Remember the review is helpful to you and your baby's health. Thank you.

Kiswahili Version

Habari .....Jina..... huyu ni CHP..... nakukumbusha
tarehe yako ya kniniki. Tarehe imeandikwa kwa kitabu chako cha kliniki. Tafadhali enda, huduma za kliniki ya wamama waliojifingua kwani ni ya faida kwako na kwa mtoto wako . Asante.

Appendix 7: Maps of the study area



Appendix 8: List and links of videos of key practices

Short videos on proper breastfeeding, keeping baby warm, neonate bathing, cord care, neonatal danger signs, and maternal danger signs.

Video links from global health media

https://globalhealthmedia.org/videos/attaching-your-baby-at-the-breast/

https://globalhealthmedia.org/videos/kumkinga-mtoto-dhidi-ya-baridi/

https://globalhealthmedia.org/videos/mshikamano-wa-kunyonyesha/

https://globalhealthmedia.org/videos/ishara-hatari-kwa-watoto-wachanga/

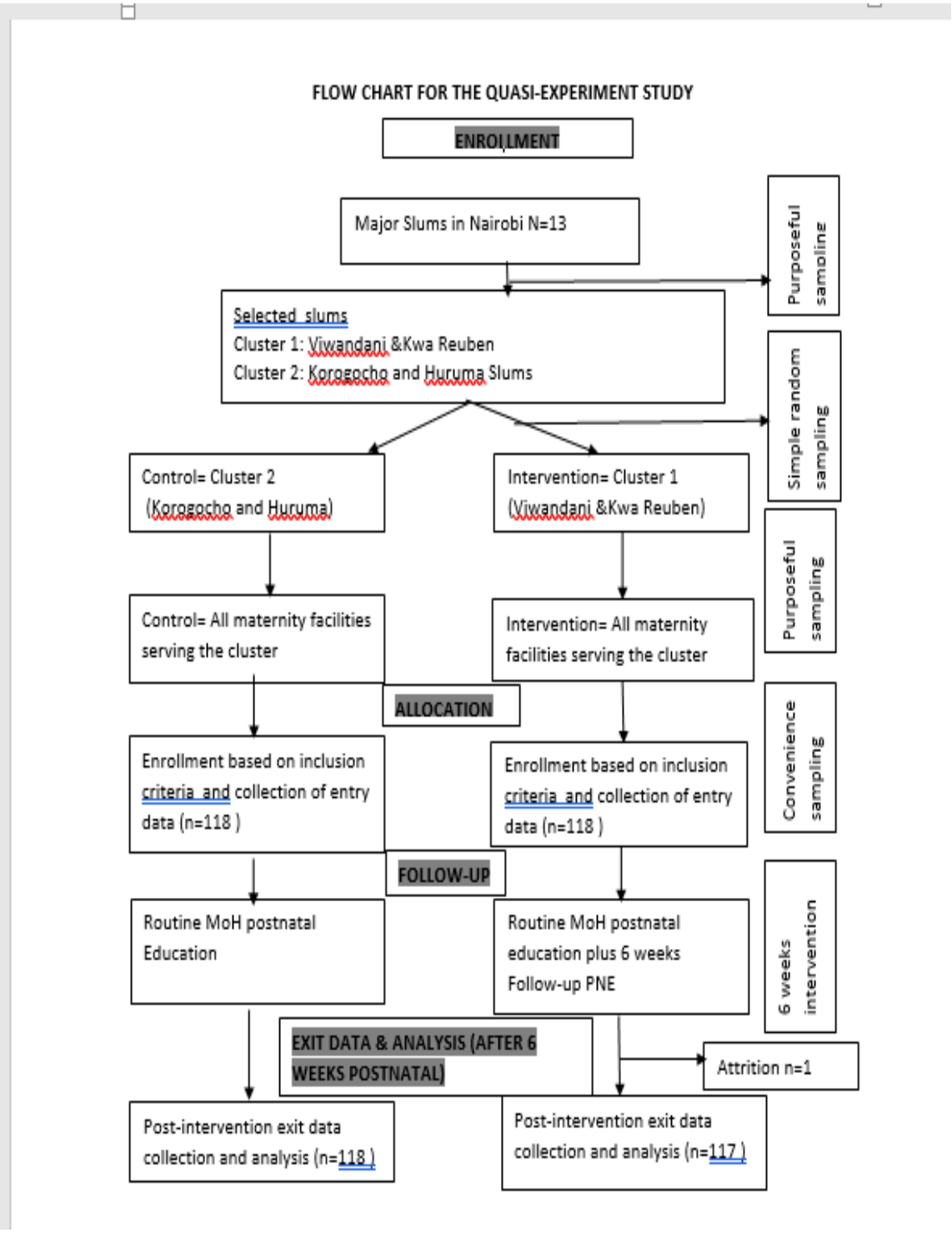
https://globalhealthmedia.org/videos/caring-for-yourself-and-your-baby-after-birth/

https://globalhealthmedia.org/videos/danger-signs-after-birth/

Appendix 9: Distribution of the target population

CLUSTER A				CLUSTER B			
Viwandani facilities	**Estimated deliveries (2019 records)**	**Mukuru kwa Reuben facilities**	**Estimated deliveries**	**Korogocho facilities**	**Estimated deliveries**	**Huruma facilities**	**Estimated deliveries**
Cana	1218	Reuben health center	941	Korogocho health center	287	Jumuia	23
Medilink	306			Mwangaza tumaini	631	Huruma nursing	1406
Olive link	726			Provide international	140	Uzima white	135
						Radiant	140
Total	2250		941		1058		1704
	Grand total (2019)		3191		Grand Total 2019)		2762
	6 months estimate		1596				1381
	Primiparas estimation (16% KDHS 2014)		255				221
	Normal birth 79%		202				175
	Discharged within 48 hrs 87%		175				152

Appendix 10: Study flow chart



Appendix 11: Postnatal education informational wall hanging

SELF AND BABY CARE TIPS

PART 1 SAVE YOUR LIFE!!!

Go to the health facility IMMEDIATELY WITHOUT WAITING (Day or night) if you notice the following maternal danger signs

1) Vaginal bleeding is heavy or has increased (soaking a pad/hour or blood clots the size of an egg or bigger) (may mean you have post partum **hemorrhage)**
2) Convulsions or fits (may mean you have a condition called **eclampsia)**
3) Pain in the chest, fast or difficult breathing (may mean you have a blood clot in your **lung or a heart problem)**
4) Fever and too weak to get out of bed feeling sick (may mean you have an infection)
5) Severe headache with swelling, blurred vision, fast or difficult breathing. may mean you have high blood pres sure or post birth preeclampsia
6) Leg; Calf- pain, redness or swelling painful or warm to touch; may mean you have a **blood clot inside the leg.**

Go to the health facility as soon AS POSSIBLE if you have any of the following maternal danger signs:

1) Swollen, red or tender breasts or nipples (you may have breast feeding problem)
2) Problems urinating, or leaking or fecal incontinence (you may have **Obstetric Fistula)**
3) Increased pain or infection in the perineum (you may have an **infection)**
4) Redness, swelling, pain, or pus in wound site in the perineum or CS scar (you may have **infection in the area of the wound)**
5) Smelly vaginal discharge (you may have an **infection)**
6) Extreme tiredness, paleness (you may have **anemia)**
7) Severe sadness/hopelessness/ not wanting the baby, suicidal thoughts - idea, plan or attempt (you may have **postpartum depression)**

Record of my symptoms

I gave birth on/ Nilizaa tarehe.....
1). Today..... ... (Date)..... I am feeling.....
2). Today..... (Date)..... I am feeling.....
3). Today..... (Date)..... I am feeling.....
4). Today..... (Date)..... I am feeling.....
4). Today..... (Date)..... I am feeling.....
My action / Hatua yangu .....

PART 2 SAVE YOUR BABY: DANGER SIGNS FOR THE NEONATE

The Mother And Family Should GO IN A HEALTH FACILITY IMMEDIATELY, Day Or Night. They Should Not Wait If The Baby Has Any Of These Signs:

1) Difficulty in breathing or in drawing, grunting or wheezing, looking blue around the mouth
2) Fits/ zeisures
3) Fever- feels hot
4) Feels cold - poor body temperature control
5) Bleeding anywhere
6) Not feeding, poor sucking
7) Yellow palms and soles of feet (Jadice)
8) Diarrhoea

The mother and family should GO TO THE HEALTH CENTRE AS SOON AS POSSIBLE if a baby has any of the following signs:

1) Difficulty feeding (poor attachment, not suckling well)
2) is taking less than 8 feeds in 24 hours
3) swollen or pus coming from the eyes, ears or skin pustules
4) Irritated cord with pus or blood, Swelling
5) Yellow eyes or skin (jaundice).
6) Ulcers or thrush (white patches) in the mouth - explain that this is different from normal breast milk in the mouth.
7) Lethargic/floppy

Record of my Baby symptoms

I gave birth on/ Nilizaa tarehe.....
1). Today (Date)..... the baby is showing the following symptoms:.....
1). Today (Date)..... the baby is showing the following symptoms:.....
1). Today (Date)..... the baby is showing the following symptoms:.....
1). Today (Date)..... the baby is showing the following symptoms:.....
1). Today (Date)..... the baby is showing the following symptoms:.....
My action / Hatua yangu.....

PART 3 ULEZI BORA KWA MTOTO WANGU.

1) **Exclusive Breastfeeding with breast milk** only for six months /kunyonyesha pekee kwa miezi sita.
Good for the baby and good for Mom!! Prevents diarrohoes, builds immunity! its economical, ready on the go, helps bond, lessens risk of breast cancer.
2) **Keep the baby warm** - a baby should wear 1-2 layers more than an adult. If cold, Put a hat on the baby's head.
3) **Care for the umbilical cord.** Keep it dry, apply chloexedine and Do not put anything else on the stump. Wash hands before cord care
4) **Keep the baby clean.** It is not necessary to wash the baby every day, but wash baby's face and bottom daily and when needed e.g after a bowel movement. Make sure the room is warm when undressing the baby.
5) You should **see a health worker on day 3 and between 7 and 14 days and 4-6 weeks after birth.**
At the 6 week visit the baby will be immunized.
6) Let the baby sleep on his/her back or side.
7) Keep the baby away from smoke.
8) It is not recommended to expose the baby to direct sun. cover the eyes and torso with a light protective clothing

1) **Maternal nutrition**- I will have an intake of greater amount, frequent , healthier balanced diet, enough water.
2) I will need to maintain **Personal hygiene,** clean the vagina and wash my hands before and after.
3) I need to get **Adequate rest and sleep** and avoid hard physical labour for the next 6 ....weeks
4) I need to **frequently empting of bladder** to make healing better
5) I will do **Pelvic floor/Kegel exercise** by tightening my pelvic floor muscles as often as possible
6) I will do **Mild physical exercise** daily e.g walk
7) I will **avoid sexual, intercourse** until the perineal wound heals and will remember the .importance of condom use to prevent STI and HIV transmission
8) I will be keen on **Birth Spacing** to allow me to heal and care for my baby and ....therefore will seek an appropriate family planning method
9) I will ensure a **conducive home environment** for promoting the health of my baby .....and myself. For example, warmth, good ventilation and hygiene for both mother and baby.
10) I and my baby will be sleeping under an insecticide-treated bednet.

Record of my important contacts / Rekodi ya number muhimu za mawasiliano

My Healthcare Provider/Clinic: ..... Phone Number: .....
Health facility Closest To Me: ..... Phone number.....
My CHV ..... Phone Number.....

Appendix 12: Self-affirmation pamphlets

PART 4

My Affirmations

Being a new mum can sometimes make me doubt myself or have "Scary Thoughts" which may be negative, repetitive, unwanted and/or intrusive thoughts or images. But I belief that :

1) I have been called to motherhood—the most powerful calling in the world
2) I am doing the best I can and everything will be okay.
3) I trust my motherly intuition.
4) I am capable of amazing things if I believe it to be true and act on those feelings.
5) I am brave and courageous.
6) I will make the most of today.
7) In the eyes, mind and heart of my baby, I am a good mom. My love and connection helps my baby above all else.
8) I am loved.
9) Taking care of myself makes me a better mom. I give myself permission to rest
10) I am powerful beyond measure and able to conquer my challenges.
11) Everything is exactly the way it needs to be in order to learn the lessons I need the most.
12) I am the exact mum my child needs to blossom.
13) I am grateful for time with my baby today.
14) My family appreciates and loves me, even when they forget to tell me so.
15) Today I will let go of any guilt weighing on my shoulders. I am not perfect but I am what my baby needs.
16) One bad day does not make me a bad mom. One bad day makes me human.
17) Today I am excited and full of energy
18) I possess the qualities needed to be fully happy.
19) Happiness is a choice and I embrace it.
20) My thoughts are filled with positivity
21) Today, I abandon my old habits and take up new, more positive ones.
22) Many people look up to me and recognize my worth; I am admired.
23) I am blessed with an incredible family and wonderful friends.
24) I acknowledge my own self-worth; my confidence is increasing.
25) Everything that is happening now is happening for my good.
26) Though these times are difficult, they are only a short phase of life. This too shall pass and I will be better
27) Today and every day I am enough.
28) I radiate beauty and I appreciate my mum body as a badge of honor
29) My obstacles are moving out of my way; my path is carved towards greatness.
30) I wake up today with strength in my heart and clarity in my mind.
31) My fears of tomorrow are simply melting away.
32) I am at peace with all that has happened, is happening, and will happen.
33) Being a good mom takes courage, and today I'm feeling brave.
34) Not loving every moment of motherhood doesn't mean I don't love being a mom.
35) I am not alone, and it is okay to ask for help
36) I don't need to get it right all the time but I am learning
37) My confidence as a mother grows every day and I become better and better every day
38) I am valued as a mother
39) My baby is safe and well and will grow up well
40) I have the resources I need to bring up my baby

If you continue to worry about the way you are feeling be sure to bring this to the attention of your healthcare provider.

PART 5

Uthibitisho Wangu

Kuwa mama mpya wakati mwingine kunaweza kunitia shaka mwenyewe au kuwa na "Mawazo ya Kutisha" ambayo yanaweza kuwa mabaya, ya kurudia, yasiyotakikana na / au mawazo ya picha mbaya.

Lakini mimi ninaamini hivi
1) Nimeitwa kuwa mama-wito wenye nguvu zaidi ulimwenguni
2) Ninafanya kila niwezalo na kila kitu kitakuwa sawa.
3) Ninaamini intuition yangu ya mama.
4) Nina uwezo wa vitu vya kushangaza ikiwa naamini kuwa ni kweli na kutenda kulingana na hisia hizo.
5) mimi ni jasiri.
6) Mbele ya macho, akili na moyo wa mtoto wangu, mimi ni mama mzuri. 7)Upendo wangu na uhusiano wangu kwa mtoto wangu husaidia mtoto wangu juu ya yote.
8) Ninapendwa.
9) Kujitunza kunanifanya niwe mama bora. Najipa ruhusa ya kupumzika
10) Nina nguvu kupita kiasi na ninaweza kushinda changamoto zangu.
11) Kila kitu kiko jinsi inavyotakiwa kuwa ili kujifunza masomo ninayohitaji zaidi.
12) Mimi ndiye mama halisi mtoto wangu anahitaji kukua vyema.
13) Ninashukuru kwa wakati ninayokua na mtoto wangu.
14) Familia yangu inanithamini na inanipenda, hata wanaposahau kuniambia hivyo.
15) Leo nitaachilia hatia yoyote yenye uzito kwenye mabega yangu. Mimi si mkamilifu lakini mimi ndiye mtoto wangu anahitaji.
16) Siku moja mbaya hainifanyi mama mbaya. Siku moja mbaya inanifanya niwe mwanadamu.
17) Leo nimefurahi na nimejaa nguvu
18) Nina sifa zinazohitajika kuwa na furaha kamili.
19) Furaha ni chaguo langu na ninaikumbatia.
20) Mawazo yangu yamejazwa na mema21) Leo, ninaacha tabia zangu za zamani na kuchukua mpya, nzuri zaidi kama mama.
22) Watu wengi wananitegemea na kutambua thamani yangu;
23) nimebarikiwa na familia nzuri na marafiki wa ajabu.
24) Ninajidhamini na ujasiri wangu kama mama unaongezeka.
25) naamini kua Kila kitu kinachotokea sasa kinatokea kwa faida yangu.
26) Ingawa nyakati hizi ni ngumu, ni kipindi kifupi tu cha maisha. Hii pia itapita na nitakuwa mama bora zaidi
27) Leo na kila siku ninatosha.
28) Ninaangaza uzuri na ninafurahia mwili wangu kama mama kama beji ya heshima ya uzazi
29) Vizuizi vyangu vinaondoka kwenye njia yangu; njia yangu inaniekeza kwa ukuu.
30) Ninaamka leo nikiwa na nguvu moyoni mwangu na uwazi akilini mwangu.
31) Hofu yangu ya kesho inayeyuka tu.
32) Nina amani na yote yaliyotokea, yanayotokea, na yatatokea.
33) Kuwa mama mzuri huhitaji ujasiri, na leo ninajisikia shujaa.
34) Kutopenda kila wakati wa kua mama haimaanishi sipendi kuwa mama.
35) Siko peke yangu, na ni sawa kuomba msaada
36) Sina haja ya kuwa sahihi wakati wote kwani ninajifunza na ninakua bora
37) Kujiamini kwangu kama mama hukua kila siku na ninakuwa bora na bora kila siku
38) Ninathaminiwa kama mama
39) Mtoto wangu yuko salama na mzima na atakua vizuri
40) Nina rasilimali ninahitaji kumlea mtoto wangu

Ikiwa unaendelea kuwa na wasiwasi juu ya hisia na mafikira yako kama kusikia huzuni, kulia, kutotaka mtoto au fikira za kujitoa uhai hakikisha elekea kwa mhudumu wako wa afya.

Appendix 13: NACOSTI Research License

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 108666

Date of Issue: 16/February/2021

RESEARCH LICENSE

This is to Certify that Ms. Immaculate Kanini of Kenyatta University, has been licensed to conduct research in Nairobi on the topic: Effectiveness of Post-Discharge Educational Intervention in Improving Postnatal Practices among Primiparas Mothers in Informal Settlements in Nairobi County, Kenya, for the period ending : 16/February/2022.

License No: NACOSTI/P/21/9804

108666

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013

The Grant of Research Licenses is Guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014

CONDITIONS

1. The License is valid for the proposed research, location and specified period
2. The License any rights thereunder are non-transferable
3. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research
4. Excavation, filming and collection of specimens are subject to further necessary clearance from relevant Government Agencies
5. The License does not give authority to transfer research materials
6. NACOSTI may monitor and evaluate the licensed research project
7. The Licensee shall submit one hard copy and upload a soft copy of their final report (thesis) within one year of completion of the research
8. NACOSTI reserves the right to modify the conditions of the License including cancellation without prior notice

National Commission for Science, Technology and Innovation
off Waiyaki Way, Upper Kabete,
P. O. Box 30623, 00100 Nairobi, KENYA
Land line: 020 4007000, 020 2241349, 020 3310571, 020 8001077
Mobile: 0713 788 787 / 0735 404 245
E-mail: dg@nacosti.go.ke / registry@nacosti.go.ke
Website: www.nacosti.go.ke

Appendix 14: Kenyatta University Ethical Review Approval

KENYATTA UNIVERSITY
DIRECTORATE OF ETHICS REVIEW COMMITTEE

Fax: 8711242/8711575
Email: chairman.kuerc@ku.ac.ke
Nairobi, 00100

P. O. Box 43844,

Tel: 8710901/12

Website: www.ku.ac.ke
Our Ref: **KU/ERC/APPROVAL/VOL.1**

Date: 20th January, 2021

Imaculate Wambui Kamau
P.0 Box 43844-00100
NAIROBI

Dear Ms. Kamau,

RE: APPLICATION NUMBER: PKU/2173/I1317 EFFECTIVENESS OF POST-DISCHARGE EDUCATIONAL INTERVENTION IN IMPROVING POST-NATAL PRACTICES AMONG PRIMIPARAS MOTHERS IN INFORMAL SETTLEMENTS IN NAIROBI ,KENYA

This is to inform you that ***KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE*** has approved version 4 of the study protocol together with the attached consent forms dated 12.09.2020. Your application approval number is **PKU/2173/I1317.** The approval period is ***20th January, 2021 TO 20th January, 2022.***

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by ***KENYATTA UNIVERSITY DIRCTORATE OF ETHICS REVIEW COMMITTEE.***
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to ***KENYATTA UNIVERSITYDIRECTORATE OF ETHICS REVIEW COMMITTEE*** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to ***KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE*** within 72 hours

v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to ***KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE***.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://oris.nacosti.go.ke and also obtain other clearances needed.

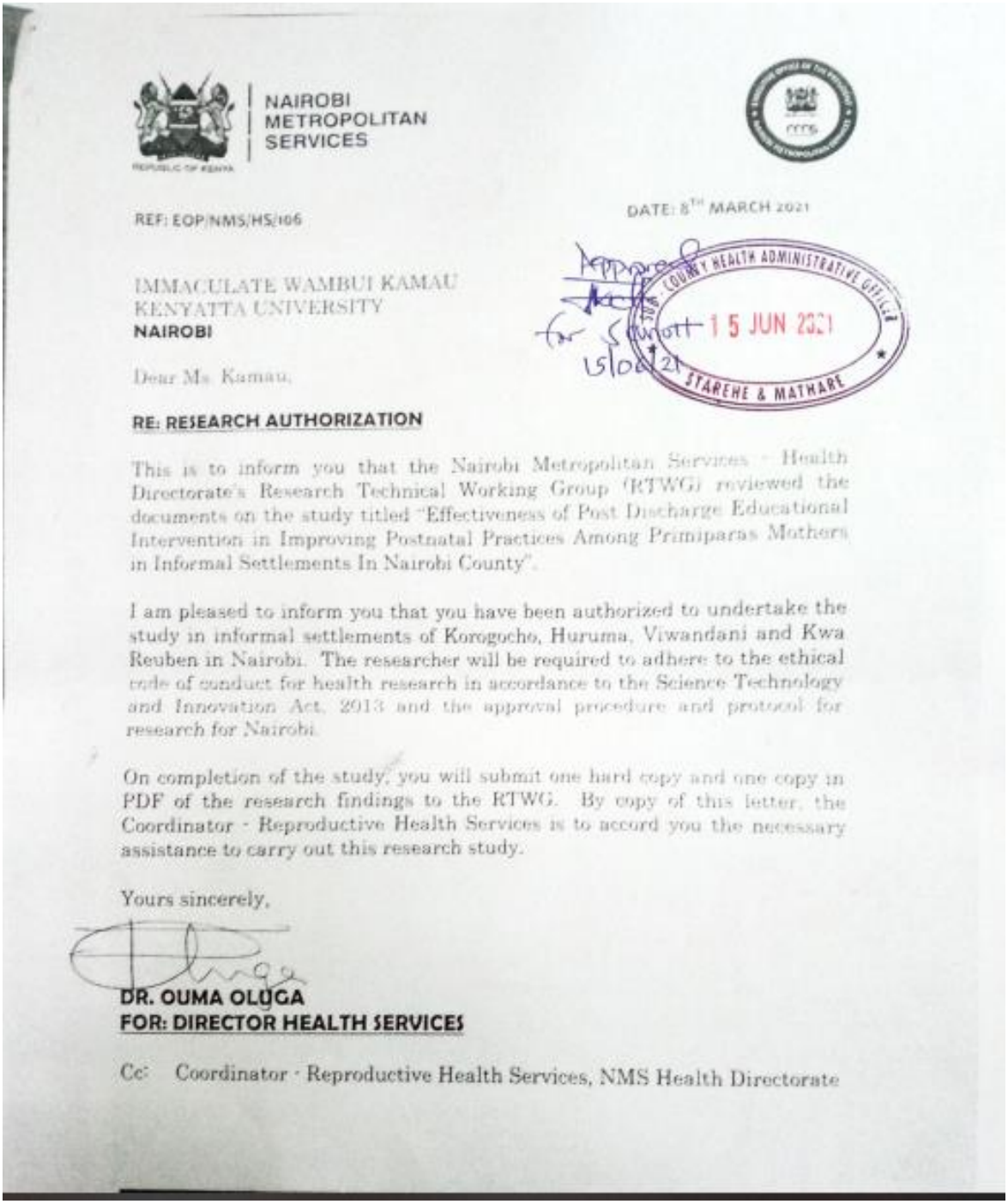
Yours sincerely

KENYATTA UNIVERSITY
OFFICE OF THE CHAIRMAN
20 JAN 2021
ETHICS REVIEW COMMITTEE
P.O. BOX 43844 - 00100 NAIROBI

Prof. Judith Kimiywe

DIRECTOR- KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE.

Appendix 15: Nairobi Metropolitan Services letter of authorization



NAIROBI METROPOLITAN SERVICES

REPUBLIC OF KENYA

REF: EOP/NMS/HS/106

DATE: 8TH MARCH 2021

COUNTY HEALTH ADMINISTRATIVE OFFICER
15 JUN 2021
STAREHE & MATHARE

IMMACULATE WAMBUI KAMAU
KENYATTA UNIVERSITY
NAIROBI

Dear Ms. Kamau,

RE: RESEARCH AUTHORIZATION

This is to inform you that the Nairobi Metropolitan Services - Health Directorate's Research Technical Working Group (RTWG) reviewed the documents on the study titled "Effectiveness of Post Discharge Educational Intervention in Improving Postnatal Practices Among Primiparas Mothers in Informal Settlements In Nairobi County".

I am pleased to inform you that you have been authorized to undertake the study in informal settlements of Korogocho, Huruma, Viwandani and Kwa Reuben in Nairobi. The researcher will be required to adhere to the ethical code of conduct for health research in accordance to the Science Technology and Innovation Act, 2013 and the approval procedure and protocol for research for Nairobi.

On completion of the study, you will submit one hard copy and one copy in PDF of the research findings to the RTWG. By copy of this letter, the Coordinator - Reproductive Health Services is to accord you the necessary assistance to carry out this research study.

Yours sincerely,

DR. OUMA OLUGA
FOR: DIRECTOR HEALTH SERVICES

Cc: Coordinator - Reproductive Health Services, NMS Health Directorate

NAIROBI
METROPOLITAN
SERVICES

REPUBLIC OF KENYA

REF: EOP/NMS/HS/106

DATE: 8th MARCH 2021

SUB COUNTY MEDICAL OFFICER OF HEALTH
RUARAKA SUB COUNTY
25 JUN 2021
SIGN...
P.O. BOX 30108 - 00100 NAIROBI

Received
ATT: 20 / facility / Korogocho
Please accord the necessary support

IMMACULATE WAMBUI KAMAU
KENYATTA UNIVERSITY
NAIROBI

Dear Ms. Kamau,

RE: RESEARCH AUTHORIZATION

This is to inform you that the Nairobi Metropolitan Services - Health Directorate's Research Technical Working Group (RTWG) reviewed the documents on the study titled "Effectiveness of Post Discharge Educational Intervention in Improving Postnatal Practices Among Primiparas Mothers in Informal Settlements In Nairobi County".

I am pleased to inform you that you have been authorized to undertake the study in informal settlements of Korogocho, Huruma, Viwandani and Kwa Reuben in Nairobi. The researcher will be required to adhere to the ethical code of conduct for health research in accordance to the Science Technology and Innovation Act, 2013 and the approval procedure and protocol for research for Nairobi.

On completion of the study, you will submit one hard copy and one copy in PDF of the research findings to the RTWG. By copy of this letter, the Coordinator - Reproductive Health Services is to accord you the necessary assistance to carry out this research study.

Yours sincerely,

DR. OUMA OLUGA
FOR: DIRECTOR HEALTH SERVICES

Cc: Coordinator - Reproductive Health Services, NMS Health Directorate

Appendix 16: Global Health Media Project letter of authorization

Global Health Media Project

Bringing Care to Life

Director:
Deborah Van Dyke, NP, MPH

29 April, 2021

To whom it may concern,

Immaculate Kamau has our permission to use our 4 videos, as is, with no modifications, in her PhD study at Kenyatta University, School of Public Health.

The study is a quasi-experimental study on supportive post discharge educational support for primiparas with an aim of assessing whether it improves the adoption of the recommended maternal and neonatal practices and maternal self-efficacy. She intends to use Community health volunteers(CHV's) to visit mothers at home within the first 7 days to reinforce their knowledge and confidence. Our videos will be used during those visits.

The videos are:

- Warning Signs in Newborns (available in English and Swahili)
- Danger Signs after Birth (available in English)
- Attaching Your Baby at the Breast (available in English and Swahili)
- Keeping the Baby Warm (available in English and Swahili)

Immaculate has kindly agreed to send us her study when it is finished to possibly post on our website.

Sincerely,

Deborah Van Dyke, Director

Global Health Media Project
Waitsfield, VT USA

Global Health Media Project, 30 Common Road, Waitsfield, VT 05673-7331, USA • +1 802.496.7556 • deb@globalhealthmedia.org
A non-profit 501(c)(3) organization, founded in 2009. All gifts are tax deductible.

Appendix 17: Pictorials