

**EFFECTS OF AN EDUCATIONAL INTERVENTION PROGRAM IN THE
OUTCOME OF NORMAL CHILDBIRTH: A CASE STUDY OF
KAKAMEGA COUNTY, KENYA**

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**A Thesis Submitted to the School of Public Health, Biomedical Science and
Technology in Partial Fulfilment for the Requirements of the Award of Doctor
of Philosophy in Public Health of Masinde Muliro University of Science and
Technology**

September, 2024

DECLARATION

This thesis is my original work prepared with no other than the indicated sources and has not been presented elsewhere for a degree or any other award.

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CERTIFICATION

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DEDICATION

I dedicate this thesis to all women who have laboured and endured the childbirth pain and those who desire to have natural births.

ACKNOWLEDGEMENTS

I thank the Almighty God for his mercy and provision. My sincere gratitude to my supervisors; Dr. Evans Raballah, Prof Mary Kipmerewo and Dr. Maximilla Wanzala, for their endless patience and intellectual support in the research and writing of this thesis. I appreciate the support of the School of Public Health, Biomedical Sciences and Technology and the Department of Public Health of Masinde Muliro University of Science and Technology. My research assistants who were of great help during data collection period in the selected health facilities of Kakamega County. Special thanks to the two coordinators Paul Mosoti and Peterson Aseli who ensured that data from all the facilities was recorded on time. I thank all the pregnant mothers who participated in the study and the administration of the respective health facilities. Finally, I appreciate my family for enduring my absence and supporting me during the entire period of research and thesis writing.

ABSTRACT

Women experience severe childbirth pain, which is one of the most agonizing pains experienced by women in their lifetime. As such, there are attempts to effectively manage childbirth pain. However, limited studies have been done on childbirth pain interventions and hence their effectiveness in the context of Kenyan health system. The study sought to find out the impact of an educational intervention program on normal childbirth among women attending maternal health services in Kakamega County since its maternal and neonatal mortality rates compare with national statistics hence need for reduction of these outcomes. Specifically, the study sought to determine the effect of the educational intervention program on the intensity of childbirth pain, self-efficacy during labour, specific maternal and neonatal outcomes as well as women's experiences with childbirth pain at the health facilities in Kakamega County. A mixed method approach was adopted where both quantitative and qualitative data was collected. A quasi-experimental design was used for the quantitative data while phenomenological design was utilised for the qualitative data on women's experiences with child birth pain. The target population were pregnant women attending antenatal services at the health facilities within Kakamega County. Fisher *et al* formula was utilised with a total of 400 as the sample size. Inclusion criteria entailed mothers who had low risks and went through spontaneous vaginal delivery. Simple random sampling was used to choose the facilities as well as mothers in the intervention N=184 and the control N=191 groups. The intervention group received two sessions of 3 hours each of the training between the 31st–33rd weeks of gestation. Ethical standards were adhered to and informed consent was obtained from all the participants. Data collection tools included structured questionnaires, Mac Gill pain questionnaire, visual analogue scale, childbirth self-efficacy inventory questionnaire and an audio tape recorder for describing women's experiences with pain. Data analysis was done by means, Mann-Whitney –tests, chi square, multivariate logistic regression; independent t tests. 19 mothers had in-depth interviews and thematic analysis was utilised to analyse their qualitative data. The intervention group significantly demonstrated lower perceived pain both on the visual analogue scale ($P<0.001$) and the McGill pain questionnaire ($P<0.001$). Mothers in the intervention group had higher post-test scores for Outcome Expectancy (OE) and Efficacy Expectancy (EE), $P<0.001$, reported less fear and anxiety than in control group $P<0.001$ and felt capable and more in control during childbirth. On the contrary mothers in the control group had more maternal and neonatal complications ($P<0.001$) and a negative birth experience compared to those in the intervention group. In the qualitative analysis mothers in the intervention had positive birth experiences and more coping strategies compared to their counterparts. The study concludes that an educational intervention program based on self-efficacy theory was effective in lowering pain perception, enhancing self-efficacy, improving maternal and neonatal outcomes as well as recording positive experiences among mothers. The study therefore recommends that this program should be incorporated into antenatal care specifically in the third trimester to prepare mothers adequately for the adverse process of labour by increasing their knowledge, coping mechanisms to childbirth pain and improving their psychological status before labour to achieve better maternal neonatal outcomes.

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LIST OF ABBREVIATIONS AND ACRONYMS

ANC	Antenatal care
ANOVA	Analysis of variance
APGAR	Appearance, pulse, grimace, activity, respirations
CI	Confidence Interval
C/S	Caesarean Section
DV	Dependent Variable
EE	Efficacy Expectancy
ERCS	Elective Repeat Caesarean Section
KCHR	Kakamega County Health Records
MOH	Ministry of Health
NBAC	Next Birth after Caesarean
NNC	Neonatal care
OE	Outcome Expectancy
PTSD	Post Traumatic Stress Disorder
SDG	Sustainable development goals
SPSS	Statistical Package for Social Science
SVD	Spontaneous Vaginal Delivery
VAS	Visual Analogue Scale
VCD	Video Compact Disc
VE	Vaginal Examination
VRS	Verbal Response Scale
WHO	World Health Organisation

OPERATIONAL DEFINITION OF KEY TERMS

Childbirth refers to completion of pregnancy where one or more babies, placenta and membranes are expelled through vaginal delivery or caesarean section. In this study it only referred to spontaneous vaginal delivery and was used interchangeably with the word delivery or parturition.

Childbirth pain in this study referred to the pain experienced by women during labour and delivery. In this study was used interchangeably with labour pain.

Educational intervention program referred to an organized schedule consisting of arranged classes where mothers were taken through to enhance their knowledge and self-efficacy in childbirth. It focused on improving knowledge and performing coping behaviours to enable them to become self-efficacious and have increased capability to bear with the childbirth pain.

Effect in this study meant impact specifically of the educational intervention program on the specific objectives of the study.

Experiences in this study referred to what women encountered during childbirth in relation to childbirth process.

Foetal outcomes in this study referred to the state of the foetus at birth; this was in relation to birth asphyxia, stillbirth, APGAR scores, alive or dead.

Intensity of pain referred to the magnitude of the pain felt during normal childbirth by the mothers.

Low risk mothers- referred to mothers who did not have any complications of pregnancy at the time of recruitment. They were to be free from hypertension, diabetes and any form of complication of pregnancy

Maternal outcomes referred to the results of labour process in this study it was limited to, prolonged labours, postpartum haemorrhage, mode of delivery any interventions that were given to mothers during childbirth.

Non-pharmacological methods of pain relief referred to use of other methods which are not drugs with the aim of increasing pain threshold and coping with pain during childbirth

Normal childbirth in this study was a process where the baby is expelled through the vagina during delivery with minimal interventions equated to natural birth or physiological birth.

Pharmacological methods of pain relief referred to use of synthetic drugs to relieve childbirth pain

Self-efficacy referred to the confidence that mothers had in executing or performing certain task in this study it was confidence of the pregnant women in coping with childbirth pain.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Pregnancy and childbirth are important aspects of the woman, her family as well as the community and recognized globally as a biological phenomenon. They are associated with psychological, physical and social changes that are very significant but challenging in the lives of women. Childbirth remains a painful experience for the majority of women worldwide. Many pregnant women equate delivery to pain owing to the fact that there is significant pain during labour and the delivery process (Catsaros and Wendland, 2020; Gagnon, 2021). In relation to the intensities of pain, women express their intensified pain through various ways. These include: crying and screaming, scattering items, removing clothes, shouting, prayer and advocating for caesarean section amongst others. These expressions are considered as pain coping strategies. Lack of coping strategies leave the women traumatised both psychologically and physically (Navarro-Prado *et al.*, 2023). In view of the above coping strategies are needed to help women cope with pain in normal childbirth.

Currently, childbirth self-efficacy is known as an important process of women's reliance in their ability to manage childbirth. There is a plethora of literature suggesting that women want to continue being in charge during childbirth (AlDughaishi *et al.*, 2023). Previously, women have alluded that health care providers spent little time with them without practicing any of the methods of pain relief and consequently they were not in control during labour. This implies that mothers are not well prepared for the process of labour due to ineffective information that is currently being conveyed during antenatal care services. Indeed, majority of

the women are anxious about labour pain and how they can be eased of this pain (Chen *et al.*, 2023). This calls for structured antenatal educational program to address this gap. Hence the proposed intervention in this study sought to address the identified gap.

Maternal and neonatal outcomes can be influenced by severe pains during labour resulting to negative effects for both the mother and the newborn. Previous investigations have established significant correlations between postpartum depression and the strength of childbirth pain (Dekel *et al.*, 2020). In addition, too much pain aggravates the mother's fear and anxiety during childbirth, which in turn stimulates the sympathetic nervous system, which culminates into increased pain, prolonged labour, and dissatisfaction with the childbearing experience (Mortazavi *et al.*, 2021). Moreover, prolonged labour causes anxiety, fear, and fatigue, which are critical in reducing a mother's self-confidence and self-esteem and increase the chances of prenatal morbidity and mortality, and interventions such as use of oxytocin, analgesia, caesarean sections and instrumental deliveries (Çankaya and Şimşek, 2021). To date, reducing maternal and neonatal morbidity and mortality has remained a global public health challenge. A step-in reduction of maternal mortality or morbidity is a positive step towards achieving sustainable development goal 2030 and this educational program enhances this goal.

Women's perceptions and experiences of childbirth has been documented .Feelings of loss of control, being helpless and feelings of madness with severe and persistent pain have been recorded in Kenya .Similar findings were found in Iran where Stress and pain were the major issues identified in normal vaginal delivery among the

primi-parous women, women had fear of damage to their babies, damage to their genitals, stressful context of labour, nauseating feelings, dyspnoea, amnesia, fatigue and imminent death and their feelings were expressed by screaming (Khamsehchian *et al.*, 2020). From the above evidence, there is need to come up with supportive measures to assist mothers go through the process of birth with empowerment and to enhance positive experiences.

The cultural, social, environmental factors, societal expectations and family support are critical in coping with childbirth pain (Navarro-Prado *et al.*, 2022). Findings from previous studies have, identified human and non-human factors that affect pain perception during labour. The human factors include parity, attendance of a pregnancy course, birth partner, knowledge about the birthing process, meaning that women ascribe to pain, attitude, expectations, emotions, motivation, knowledge, learning, memory and emotional support, while the non-human factors consist of pharmacological and non-pharmacological methods of pain relief (Thomson *et al.*, 2019; Nguyen *et al.*, 2021).

Accumulating evidence suggests that some educational interventions have proven to be effective in relieving or coping with pain, fear and anxiety during labour, promoting self-efficacy as well as enhancing positive experiences among women. The antenatal educational program in China improved self-efficacy and reduced pain perceptions among first time mothers (Wan-yim .ip *et al.*, 2009). In the United States, Mindfulness Childbirth Education during antenatal care proved to have significant maternal psychological health benefits to include better childbirth related appraisals, less postpartum depression signs and limited use of pharmacological

agents during childbirth (Babbar *et al.*, 2021). Similarly, in Turkey a 6week antenatal period impacted positively on maternal self-efficacy and enhanced maternal role adjustments (Gün Kakaşçı *et al.*, 2021). Fear of childbirth anxiety and depression was significantly reduced in women who attended antenatal education in Spain and Taiwan (Aguilera-Martin *et al.*, 2021; Kuo *et al.*, 2022).

In India, spontaneous onset of labour, increased vaginal births, short periods of labour and less need for interventions were positive outcomes associated with antenatal education (Karkarda *et al.*, 2023). Positive childbirth experiences and enhanced maternal health was achieved through childbirth education programs in Saudi Arabia (Alkhumizi and Alhamidi, 2023). In Ethiopia, high level of knowledge on the procedures of labour and childbirth was associated with decreased negative emotion and reduction of experienced pain (Haso *et al.*, 2021). Fewer cases of bleeding and seizures were documented during labour for mothers who went through family oriented antenatal care in Tanzania (Shimpuku *et al.*, 2019). Sufficient information on labour and coping strategies impacted positively on women's experiences during childbirth in Nigeria. The above evidence necessitates the incorporation of structured antenatal education programs to improve maternal and neonatal outcomes.

However, little attention has been given to the aspect of fear, anxiety and pain during childbirth in majority of health care facilities in Kenya. Evidence from previous studies in the Kenyan public hospitals have revealed that majority of women have experienced longer and more painful labour than anticipated. In addition, most women do not receive any childbirth education during the routine antenatal period

(Oluoch-Aridi *et al.*, 2021). A previous study carried out in a tertiary hospital in Kenya among health care workers revealed that majority of the health care providers in maternal health had inadequate knowledge on labour pain management. Poor protocols and guidelines were also cited as health system barriers (Ouma, 2022). Lack of knowledge on birthing process and ways of coping resulted in perception of high intense pain among mothers, with most women describing their pain as agonizing, harrowing and torturing (Waweru –Siika, 2019). In view of the above evidence, mothers need to be prepared well on the procedures and coping strategies to enable them have positive experiences of childbirth.

Kakamega County is one of largest Counties in Kenya with one of the highest numbers of deliveries recorded annually, approximating 64,000 births. Majority of these births occur through spontaneous vaginal deliveries (SVDs). Most health facilities in the public domain do not have organised classes where pregnant women are taught on the labour process, ways of coping with pain and being in control during labour. In the year 2021, out of 63127 deliveries in Kakamega County, 4409 were caesarean sections, 1856 mothers experienced prolonged labours, 579 had postpartum haemorrhage, 2,460 babies had birth asphyxia (KCHR, 2021). To reduce such adverse outcomes of childbirth, support strategies are imperative.

The current study adapted an educational program that was used in China (Wan-yim .ip *et al.*, 2009). The previous study utilised a randomised control trial, the study was among first time mothers and it was purely quantitative. However, the current study used both quantitative and qualitative approach to gain more understanding of the women's experiences, all mothers were recruited whether primi-gravidas or multi-

gravidas since pain perception differs between individuals and multiparas would follow the educational instructions better since they had prior experience, and the interaction time with mothers was more in the current study to enhance competency. Recent investigations have shown that majority of women prefer non-pharmacological and non-invasive methods of pain relief during labour (Hu *et al.*, 2021). The efficacy enhancing educational programme is therefore a viable option for most women in the Kenyan context.

Addressing the challenge of childbirth pain, fear and anxiety is a significant concern not only to women of reproductive age but also to the childbirth health specialists. In the current study, an educational intervention program entailed the introduction of structured childbirth education during antenatal care. Pregnant mothers in the intervention group were prepared physically and psychologically for the process of labour in their third trimester of pregnancy. This was done by educating mothers on the birthing process, procedures, and expectations. Various non-pharmacological methods of coping with pain were also taught and rehearsed. The aim was to promote self-efficacy and reduce anxiety and fear during childbirth. Cognitive restructuring of childbirth pain was also explained. This program was offered in addition to the routine antenatal care that was attended by the mothers in the health facilities. The control group went through the routine standard antenatal care which is provided by the hospitals. Comparisons were made with regard to the intensities of pain, maternal self-efficacy, maternal and foetal outcomes, and experiences of childbirth between the intervention group and the control group.

The antenatal educational program was effective in reducing pain, anxiety, lowering caesarean births and improving self-efficacy among mothers in industrialised and regional countries (Hong *et al.*, 2021). However, little is known about the impact of this program on childbirth in low- and middle-income countries (LMICs) like Kenya. The knowledge gained in this study potentially provides information on how best to address the issue of intense pain in childbirth and reduce some of the morbidities like prolonged labours and increased maternal requests for caesarean birth for fear of extreme childbirth pain.

1.2 Problem Statement

Several studies have shown that the pain of labour and childbirth is one of the most severe and distressing events in a woman's life. It is often a stressful event that creates fear, anxiety and uncertainty for many women around the world (Gagnon, 2021). In view of the above, most strategies have been put in place more so in the industrialised countries to include structured antenatal educational programs to prepare mothers for the adverse process of labour and to enhance maternal outcomes and positive childbirth experiences (Aquilera martin *et al.*, 2021). However in Kenya and in Kakamega county, most health facilities do not have antenatal care classes where mothers are educated on the process of labour and equipped with the necessary skills to cope with childbirth and instead are left to labour naturally without any pain strategies leading to negative birth experiences (Buback *et al.*, 2022; Ouma, 2022). The current study adapted a theory based educational program that was utilised in China among first time mothers (Wan-yim .ip *et al.*, 2009). Unlike the previous investigation the current study utilised mixed method approach where both quantitative and qualitative aspects on the objectives of the study were

explored, the qualitative aspect was added in the current study to explore women's perceptions and experiences with the program, in addition the current study included both first time mothers and those who had experienced birth before as experience was useful in enhancing education. Lastly the current study determined maternal and neonatal outcomes which were not explored in the previous study and therefore gives a new insight on the influence of a theory-based intervention on maternal and neonatal outcomes. The setting and populations studied also varied hence the need for the current study. Although the preparation for labour is well established component of maternal care, its evidence base is limited. Guidelines do exist in the current policy but a well-established program to address women's concern during labour and childbirth are lacking in most government facilities where majority of pregnant women seek care. The current WHO recommendations and guidelines for a positive pregnancy experience outlines, nutritional interventions, maternal and foetal assessment, interventions for common physiological problems and health systems interventions to improve the utilization and quality of antenatal care (WHO, 2018). The aspect of childbirth preparation is lacking which makes mothers to be fearful, anxious and opt for caesarean births due to lack of education on childbirth and coping skills. The 21st and 22nd recommendations by WHO for intra-partum or labour care for a positive childbirth experience advocates for relaxation and manual techniques for pain relief in labour to include breathing techniques, massage, music, mindfulness among other measures, however the policy does not guide how or what should be done to prepare mothers for childbirth and at what time of the gestation. This study addresses this gap in policy by providing a well-established program based on self-efficacy theory to be taught on self-efficacy and coping strategies during the third trimester of pregnancy to help them cope with childbirth.

Previous investigations have established significant correlations between postpartum depression and the strength of childbirth pain (Dekel *et al.*, 2020). In addition, too much pain aggravates the mother's fear and anxiety during childbirth, which in turn stimulates the sympathetic nervous system, which culminates into increased pain, prolonged labour, and dissatisfaction with the childbearing experience (Mortazavi *et al.*, 2021). Moreover, prolonged labour causes anxiety, fear, and fatigue, which are critical in reducing a mother's self-confidence and self-esteem and increase the chances of prenatal morbidity and mortality, and interventions such as use of oxytocin, analgesia, caesarean sections and instrumental deliveries (Çankaya and Şimşek, 2021).

The educational intervention program aims at educating pregnant women about the birthing process, reducing anxiety, fear, and pain and building self-efficacy about childbirth. This will improve childbirth outcomes among women of reproductive age.

1.3 Objectives of the Study

1.3.1 Broad objective

To determine the effects of an educational intervention program in normal childbirth among pregnant women attending health facilities in Kakamega County.

1.3.2 Specific objectives

- i. To determine the effect of an educational intervention program on the intensity of childbirth pain among mothers who will go through normal childbirth at the health facilities in Kakamega County.

- ii. To evaluate the impact of an educational intervention program on women's self-efficacy during normal childbirth at the health facilities in Kakamega County.
- iii. To examine the influence of an educational intervention program on maternal and neonatal outcomes through normal childbirth at the health facilities in Kakamega County.
- iv. To establish the effect of an educational intervention program on women's experiences with childbirth pain at the health facilities in Kakamega County.

1.4 Research Question

- i. Will an educational intervention program influence women's perceptions and experiences with childbirth at the health facilities within Kakamega County?

1.5 Hypotheses

H01: There will be no statistically significant difference in the intensities of childbirth pain felt between mothers who will go through an educational intervention program and those who will go through the standard care.

H02: There will be no statistically significant difference in self-efficacy during labour between mothers who will go through an efficacy enhancing educational intervention program and those who will go through standard care.

H03: There will be no statistically significant difference in maternal and neonatal outcomes between mothers who will go through an efficacy enhancing educational intervention program and those who will go through the standard care.

1.6 Justification of the Study

A lot of evidence has been documented on women's experiences with childbirth pain. In contrast there is limited evidence on the efficacy of childbirth pain interventions and thereafter the experiences of pain among women in the Kenyan setting. The current study sought to address this gap-in-knowledge. This study is also in line with the sustainable development goal 3 that advocates for good health and well-being at all stages of life. Importantly, target one of the sustainable development goal 3 is concerned about reducing maternal mortality. Addressing pain in labour would help reduce prolonged labours associated with intense pain consequently reducing post-partum haemorrhages, which are a major cause of morbidity and mortality among women. Decreasing labour pain intensity during childbirth is promoting the physical, mental, sexual and reproductive health of childbearing women. This will also give women a sense of pride and confidence to motherhood. Moreover, this would help mothers go through the natural physiologic birth with ease and reduce anxiety, fear and childbirth pain.

Reduced stress and pain in labour would enhance safe maternal and new-born transitions and adaptations after birth as well as better maternal and neonatal outcomes (Gün Kakaşçı *et al.*, 2021). This would reduce maternal and neonatal morbidities and mortalities related to unaddressed intense childbirth pain. Currently addressing pain in childbirth is a significant moment with the intention of alleviating pain and relieving distress. Although the association between childbirth and pain is known, it remains unclear the modalities of pain relief and its appropriateness during childbirth (Hu *et al.*, 2021). This study sought to address the above gap through an educational intervention program during the antenatal period where mothers in the

intervention group were prepared physically, emotionally and psychologically to undergo the stressful process of childbirth. The WHO currently advocates for antenatal care that promotes positive pregnancy experiences that are described as expectant mothers having successful transition to positive childbirth and attaining positive motherhood that promotes their autonomy self-esteem and skills (WHO, 2016).

1.7 Significance of the Study

Findings derived from this study will help health institution to implement and advocate for childbirth education classes for pregnant women going through normal childbirth. The health care personnel especially midwives working at the antenatal unit need to prepare mothers adequately, physically and psychologically for the process of labour with the aim of reducing anxiety and fear related to childbirth pain as well as promoting self-efficacy during labour. This will improve the quality of maternal and neonatal health; improve antenatal care attendance and consequently skilled birth attendance. These are positive steps towards reduction in maternal and neonatal morbidities and mortalities and realization of the sustainable development goal 3 by the year 2030.

1.8 Delimitation of the study

Pregnant women attending ANC care and subsequently intrapartum care in the facilities within Kakamega County were studied. The study sought to find out the intensities of childbirth pain as experienced by women during childbirth, their self-efficacy during childbirth and specific maternal and neonatal outcomes. A qualitative aspect of women's experiences during childbirth was also explored. The effect of

the intervention was assessed by comparing the findings from the standard care and those that went through the efficacy enhancing educational program.

This study used a quasi-experimental design for the quantitative data and a phenomenological approach for the qualitative data. The study focused on pain intensities at its highest moments and not at every stage of labour. The maternal efficacy was measured by individual scores where those who achieved half the total marks were regarded as efficacious. Maternal outcomes were restricted to bleeding associated with prolonged labour, failure to progress, caesarean sections and prolonged labours. Neonatal outcomes were limited to APGAR scores and whether the neonate was born alive or dead. This study aimed to promote the practice of normal labour and birth which is slowly and gradually being replaced by caesarean sections on maternal request for fear of childbirth pain (Khomehchian *et al.*, 2020). This was enhanced through the educational intervention program with the major focus on the birthing process, self-efficacy and non-pharmacological ways of pain relief in labour. This will help to avoid unnecessary interventions in labour and decrease the rate of caesarean births that has more maternal morbidities and mortalities. A step towards decreasing women's pain in labour would promote positive childbirth experience and a desirable memory (Ghanbari-Homaie *et al.*, 2021). This will consequently enhance the skilled birth attendant among women of reproductive age as it will improve on the pull factors for hospital delivery.

1.9 Limitations of the study

Some of the limitations in this study included attrition, that is, loss of participants to follow-up. Some women also developed complications and ended up with caesarean

births and other complications, however these did not affect the intended sample size and analysis of the study since there was an added 20% of the calculated sample size. The study findings may be limited to the low and income earning countries including Kenya and may not be generalized to the developed countries since their setting is different.

1.10 Theoretical Model

1.10.1 Self-efficacy theory

The theoretical model that underpin the development of this intervention was based on constructs from self-efficacy theory of motivation that was invented by the psychologist Albert Bandura, (Bandura, 1977). He described self-efficacy as an individual's reliance on their competence to utilize authority not only over their own behaviour but also over occurrences that influence their lives. An individual's sense of competency can give a foundation for inspiration, good health and personal achievements. Beliefs in individual's self-efficacy originate from four main sources of guidance that include experiences, verbal persuasion, role-modelling and physiological feedback. Numerous benefits to daily life have been linked with high self-efficacy, such as ability to recover or adjust easily to distress; healthy way of life, enhanced employees' accomplishment and attainment of educational goals.

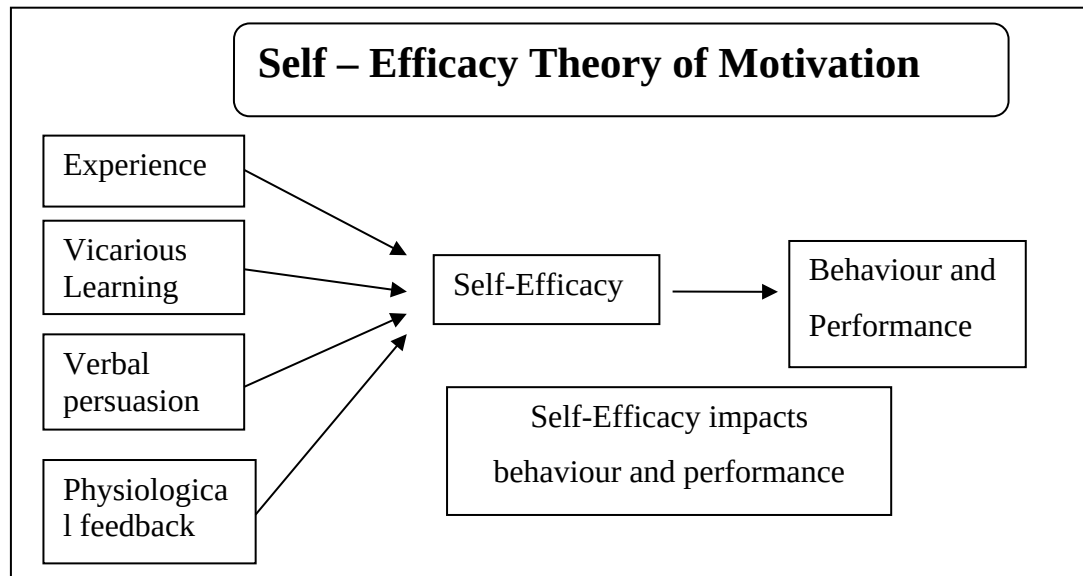


Figure 1.1: Self-Efficacy Theory of Motivation (Lopez-Garrido, 2023).

1.10.2 Mastery experiences

The interpreted results of an individual’s earlier achievement impact more in this domain. Mastery experiences refer to the success, new knowledge or skill one gains when they encounter hardship. An individual’s capability to be proficient in whatever it takes to positive results gives the most genuine proof hence, giving the most impact on efficacy. A strong trust in one’s ability is built by success. Personal efficacy is undermined by failures, more so if they happen prior to a confirmed sense of self-efficacy. Practise is one of the ways to acquire competency and enhance an individual’s achievement in a given task. In the current study mothers practiced non-pharmacological techniques of pain relief until they mastered the methods for their use during childbirth.

1.10.3 Vicarious experiences

Self-efficacy can also be obtained from social models. Vicarious experiences provided by social models are the second important source of self-efficacy. Earlier

evidence implies that observing individuals who are self-achievers through hard work increases the observer's trust that they also have the ability to become proficient in similar tasks (Bandura, 1977). Looking at individuals victoriously accomplishing an activity is what entails vicarious experiences. Individuals who have efficacious role models in their lives more so those who show a high level of competency impacts positively on individual reliance about self by captivating positive beliefs from models. In this study a VCD audio-visual was provided, showing two mothers go through successfully the process of childbirth. Mothers who have delivered before also shared their successful labour stories and participants were encouraged to think about their grandmothers, mothers and friends who have successfully gone through childbirth. These encouraged those who were fearful and doubting themselves that they are capable just like others who went through the process of labour.

1.10.4 Verbal persuasion

An individual is convinced that they possess the competencies to triumph if they receive constructive verbal feedback while undertaking a complex activity. Uplifting or demoralization concerning one's achievement, impact on self-efficacy (Redmond, 2010). Building of self-efficacy through verbal persuasion is more effective when administered in earlier ages though it works at any age. In this study pregnant women were persuaded that they are capable of withstanding childbirth pain through various ways that they were taught. This was done early enough in the third trimester before the onset of labour.

1.10.5 Emotional states

Emotional, mental and physical health of an individual can affect their personal perception and potential in a given circumstance. A person who is sad or worried finds it difficult to achieve optimum health. It is easier to boost self-efficacy if one is in a state of good health and well-being (Shortridge-Baggett and perspectives, 2000).

Recent investigations agree with earlier studies that, it is not the sheer magnitude of psychological and physical response that is significant but rather how they are viewed and clarified (Lopez-Garrido, 2023). Individuals who are efficacious are likely to perceive their state of affective arousal as a trigger and enabler of achievement, while those who are afflicted with uncertainties consider their activation as impairing. Therefore, by learning how to address worry, uncertainties and lifting the mood when experiencing adverse circumstances, individuals can enhance their competencies in executing specific tasks. In the current study, pregnant mothers were allayed of anxiety, fear and uncertainty related to childbirth by reassurance and teaching on the basic biology of childbirth as well as non-pharmacological ways of pain management.

1.10.6 Imaginal Experiences/Visualization

Imaginal experiences is the recent fifth way to self-efficacy as proposed by Maddux (Maddux, 2013) it is envisaging oneself acting competently in a given circumstance. An attempt to portray one's goals as achievable is imaginary experiences or visualization. It's imagining oneself in a prime position of attaining anything that their mind sets on. To promote an individual's self-efficacy, their centre of attention

should be on painting a picture that puts achievement as the most likely consequence (Maddux and Kleiman, 2016).

Previous studies proposed that painting oneself or others in an appropriate position increases the competencies in the individual as he or she is now more vulnerable after presenting themselves at the end to trust in themselves (Maddux and Kleiman, 2016). In the present study mothers were encouraged to imagine how joyful it would be after withstanding childbirth pain to hold and breastfeed their infant. That every pain they experienced moved them closer to the end of labour.

Labour and childbirth are stressful events in women's life time that require innovative and ameliorative means to manage. High efficacy is therefore required to overcome the stress by building resilience and internal strength. Self-efficacy theory was therefore suitable for this study to enable mothers develop competencies required during childbirth.

Ip *et al.*, (2009) reiterated that less effort has been done to incorporate self-efficacy into prenatal care despite the numerous benefits in other aspects of life like education, exercise and improvement of employee performance. This is happening with the fact that self-efficacy is necessary for women to cope with childbirth. The current study addressed the above gap in literature.

1.10 Conceptual Framework

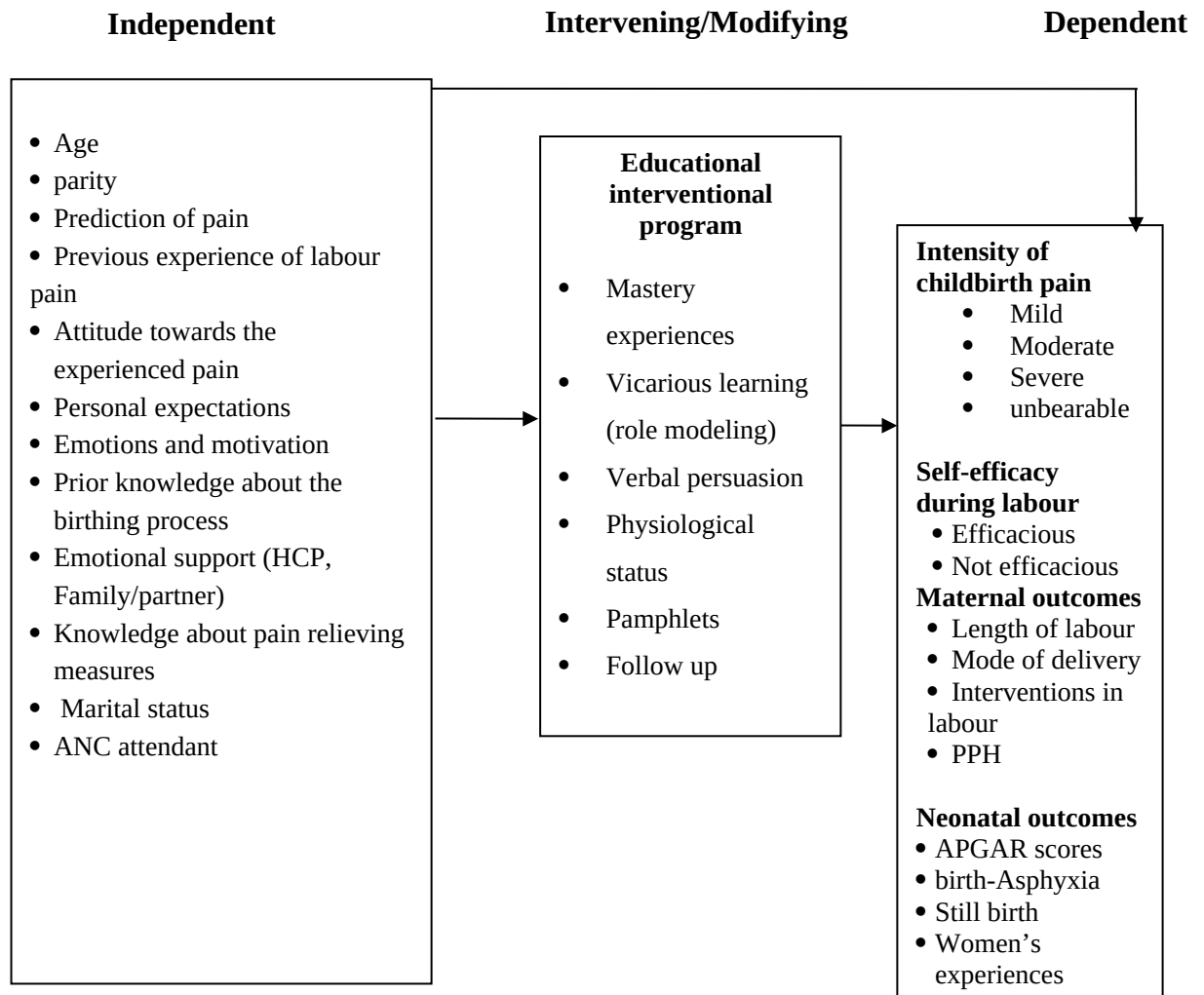


Figure 1.2: Conceptual framework adapted from self-efficacy theory (Maddux, 2013)

The conceptual framework was based on the theoretical framework developed by Maddux 2013 who improved on Albert Bandura's self-efficacy theory. The conceptual framework had the independent, intervening/modifying and dependent variables. Evidence has shown that several factors influence pain perception in childbirth. These factors are independent variables and include; cultural beliefs about labour, age, parity, prediction of pain, previous experience of labour pain, prior

knowledge about the birthing process among others that have been listed under independent variables. These factors affect either positively or negatively the dependent variables which include, intensity of childbirth pain felt by women, efficacy during childbirth, and specific maternal and neonatal outcomes and the experiences. The independent variables of mothers who went through the standard care directly have an influence on the dependent variable like the intensity of childbirth pain without the intervening or modifying variable. The intervening variable which was an educational intervention program aimed at promoting efficacy and pain coping strategies among women. It used the main domains of the self-efficacy theory like mastery experiences, vicarious learning and verbal persuasion. This may have influenced the intensity of childbirth pain felt, self-efficacy during labour, maternal and neonatal outcomes. The intervention group went through an efficacy enhancing educational intervention program and their outcomes compared with the control group to determine the effect of the intervention.

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CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviewed literature on childbirth pain, factors affecting pain perception, factors associated with efficacy, impact of pain on maternal and foetal outcomes, and women's experiences with pain.

2.2 Child Birth Pain

Pain experience is the most compounded human sensational encounter. This is because of the impact it has on mental, social and physiological elements that influence the magnitude and period of experienced pain. Internationally, pain is described as a compound sensory and psychological experience, that at all times is individualistic and associated with actual or possible tissue injury (Cabral *et al.*, 2023). With the exception of a few women, childbirth is an agonizing event for the majority of women. Childbirth pain emanates from some physiologic origin and is also influenced by the psychological state of an individual. If a mother goes through the pain with a psychological perception, response towards it would be different (Chen *et al.*, 2023). Pain is an occurrence that has neither been comprehended nor discovered totally yet its quantification or assessment could be really hard. For this reason, personal encounter with pain is considered as an authentic point for its understanding and the person experiencing it can describe it. Pain is an occurrence to an individual and it exists when an individual verbalizes about it (Chilee *et al.*, 2020).

2.3 Factors that affect pain perception in childbirth (intensity of pain)

2.3.1 General and personal factors

Several factors have been identified to affect pain perception in general, these include, sex, anticipation of pain, and tradition. In pregnancy and labour, identified factors such as complicated pregnancy, inadequate knowledge and bad incident of the earlier pregnancies as factors that can intensify labour pain at the same time a usual pregnancy, motivation, satisfaction and composure can reduce labour pain and hence make a conducive environment for childbirth (Nguyen *et al.*, 2021; Navarro-Prado *et al.*, 2022). For this reason, happy and relaxed women who are not facing real pains tend to experience increased pain threshold (Tabib *et al.*, 2021). Personal perception towards the experienced pain, anticipation, inspiration emotions and education one has, all impart variability in the magnitude and quality of experienced pain. Factors like inspiration, views, education, recollection, reasoning, perception are connected to the psychological element of experienced pain (Leutenegger *et al.*, 2022).

Previous studies done in the Kenyan context have revealed that most women are anxious, lack knowledge on the birthing process and ways of coping with pain hence experienced high intensity pain (Oluoch-Aridi *et al.*, 2021; Ouma, 2022). The current study sought to address the above concerns by alleviating anxiety, fear and increasing knowledge about the birthing process, addressing the previous bitter experiences and motivating them to have self-efficacy during childbirth. This in turn would have reduced labour pain perception among women.

2.3.2 Non-pharmacological approaches of pain relief in childbirth

Additionally, non-pharmacological techniques like emotional support from others help women to withstand labour pain. Support from spouses, health care providers, support staff, friends and family members provide emotional support to labouring women. Other non-pharmacological methods of pain management utilized by women during childbirth include breathing techniques, bathing, changing positions and moving about to relieve their discomfort. Some women endure childbirth pain by means of prayer to the Almighty to decrease their pain (Chilee *et al.*, 2020; Haso *et al.*, 2021; Cabral *et al.*, 2023). In the current study the efficacy enhancing intervention program entailed teaching on non-pharmacological ways of coping with pain in order to empower pregnant women during childbirth. Studies have shown that ANC does not adequately address childbirth pain and ways of relieving it (AlDughaishi *et al.*, 2023).

2.3.3 Effect of health care providers support and the sex of the child on perception on childbirth pain

Health care providers specifically midwives contribute significantly in relieving childbirth pain mainly by relating positively with labouring women and also by expressing kindness and motivating women in labour (Khomehchian *et al.*, 2020). In some cultures, sex of the child will influence the perception and intensity of pain. This was observed in Iran where delivery of a girl child was associated with more pain compared to the delivery of a boy (Navarro-Prado *et al.*, 2022). This can be attributed to the fact that their culture prefers male over female children.

2.3.4 Effects of parity, birth partner and attendance of a pregnancy course on perception of childbirth pain

Previous studies have associated parity, attendance of a pregnancy course, birth partner, and prenatal health of the mother, maternal efficacy and knowledge about birth process and the lower perception of pain during birth. In the same study, being a first-time mother and having high levels of anxiety was associated with high intensity pain (Romanenko *et al.*, 2022). Contradictory results were recorded in Poland where there was insignificant statistical variation in the assessment of pain that was detected among those who attended the pregnancy course and those who did not in terms of pain perception (Kuciel *et al.*, 2021). This could be ascribed to the fact that the study was done during the pandemic of COVID-19 and all mothers were fearful regardless of the intervention as fear and anxiety has been associated with intense pain. The current study determined how an educational program and the independent variables above would influence the perception of pain among women during childbirth.

2.3.5 Effect of women's knowledge on childbirth and pain perception

Previous investigations show that, parturient who had higher self-reported estimate of pre-existing knowledge about childbirth experienced lower intensity on the procedures of labour and childbirth pain (Haso *et al.*, 2021). High level of knowledge on the procedures of labour and childbirth is related with the strength of fright and awful emotions. On condition that overall mood is connected with the quality and strength of pain, it is practical that being confident with the procedure of childbirth would decrease negative emotions predominantly anxiety that would result in reduction of the experienced pain (Haso *et al.*, 2021).

First time mothers' understanding about childbirth was an important determinant of the beneficial components in decreasing the intensity of childbirth pain. This underscores the significance of being knowledgeable about labour and childbirth. Hu and colleagues, generated similar findings that stresses on the importance of education in preparation for childbirth (Hu *et al.*, 2021). AlSomali, and colleagues (AlSomali *et al.*, 2023) proposed that it would be, important to arrange a set of classes relying on an educational approach to labour and delivery. This would majorly aim at decreasing fear and childbirth pain among expectant women in labour. The unpredictability that women anticipate is often much harder to put up with than the labour and delivery itself. This specific cue makes education significant. Learning would not only enhance women's knowledge and comprehension of childbirth but also give psychological support for pregnant women.

Pain is always accompanied with nervousness and requires ameliorative and combative means to solve it (Bakhteh *et al.*, 2022). It is also considered that, gravidity and childbirth are natural occurrence that can elicit various emotions in an individual. Demographic information can affect women's ability to acquire information and planning being in control of their delivery (Bostan *et al.*, 2022). Lack of knowledge on the birthing process and various ways of coping during childbirth has been documented in the previous studies (Oluoch-Aridi *et al.*, 2021; M. Y. AlDughaishi *et al.*, 2023). The current study sought to increase knowledge about the birthing process and various non-pharmacological ways of coping with pain as well as being efficacious with less fear and anxiety.

2.3.6 Effect of the ‘Meaning’ ascribed to childbirth pain and its perception

Several authors have reported that the predicting element of a woman’s episode of pain during childbirth is the meaning she attributes to it. When women transcribe the pain as constructive and deliberate, it is connected with positive cognitions and the possibility of coping is increased. On the other hand, when women transcribe the pain as menacing, it is connected with negative cognition's and emotions makes them helpless and push them to outsource assistance from extrinsic means of pain control. The society plays a significant role in moulding a woman’s experience with pain by determining interpretation of the circumstances surrounding pain, and as a result vary its meaning (Chilee *et al.*, 2020; Navarro-Prado *et al.*, 2022; Zou & Wallis, 2022; Sheffield and Liddell, 2023).

The society and other surrounding factors where pain is experienced mould the meaning ascribed to pain. We can enhance women’s experiences of childbirth pain and at the same time help to reduce their necessity for pain interventions by concentrating on the perception of labour pain as a constructive and important pain. Empowering women to use their intrinsic power to cope and concentrating on their cognitions and the society around them can also succeed (Navarro-Prado *et al.*, 2023). Prior evidence has shown that most women are worried of childbirth pain and always remember this experience as negative and traumatizing (Chilee *et al.*, 2020). These negative feelings and thoughts have been passed on from one generation to another and as such childbirth pain has been loathed by many women and currently most women are requesting for caesarean sections (Khomehchian *et al.*, 2020).

In the educational intervention program, mothers were taught on the positive aspect of childbirth pain, that indeed it is necessary as it brings about a positive outcome who is the baby. The pain does not last forever and women who have gone through the natural physiologic birth heal faster, have fewer complications and are able to adapt well in the immediate post-partum period compared to those who have gone through caesarean births. This could have helped women to view childbirth pain in a positive light and encouraged more to go through natural childbirth.

2.3.7 Pharmacological and contemporary agents used in childbirth pain

The pharmacological ways of pain relief include; entonox, pethidine, ramifentanil, transcutaneous electrical nerve stimulation and epidural. These methods are seldom used since evidence has shown that they have negative outcomes on the mother and foetus. Moreover, some of the methods are expensive and unavailable in most public health facilities where majority of women go for labour and birth (Thomson *et al.*, 2019; Nguyen *et al.*, 2021). Other modalities for pain management in labour have also been investigated to include acupuncture, hypnosis, relaxation, reflexology, herbal medicine, homeotherapy, massage, music, white noise audio analgesia, using water in labour. However, their efficacy has not been established therefore more research is needed to proof their efficacy and safety for use during childbirth (Geltore and Angelo, 2020). Evidence shows that majority of women prefer non-pharmacological and non-invasive ways of pain management in labour (Hu *et al.*, 2021). The efficacy enhancing educational programme is therefore a viable option for most women going through natural physiologic childbirth due to the fact that it promotes non-pharmacological ways of pain relief.

2.4 Expression of childbirth pain among women

Women have expressed labour pain in various ways, when childbirth pain increases; women demonstrate pain through wailing and sobbing, scattering items, removing clothes, shouting and advocating for caesarean section (Khomehchian *et al.*, 2020; Gagnon, 2021). Such manifestations help women to bear with labour pain. At times some women ignore labour pain and are impassive (Navarro-Prado *et al.*, 2022). Sheffield and Liddell (Sheffield and Liddell, 2023) in their study revealed that disregard of the present pain easement measures by women and traditional bias explains the less need for labour pain relief. Additionally, there is a strong trust amid some Ghanaian traditional class that, it is embarrassing if others realize one cannot withstand labour pain. Because of this belief women who are unable to bear labour pain are regarded as psychologically weak (Sheffield and Liddell, 2023).

In Kenya, women perceived health care workers to have a non-caring attitude towards their pain (Buback *et al.*, 2022). Others felt that delivery should be recorded and shown to their husbands to witness how difficult it is to deliver babies through their screaming and shouting. Women also expressed their views that husbands do not understand the subject of labour and delivery but only order women to deliver their desired gender of the baby (Navarro-Prado *et al.*, 2022). The above literature reveals that culture greatly influences the expression of childbirth pain among women. Being stoic does not necessarily mean absence of pain. There is also need for male involvement in childbirth to enhance their comprehension of childbirth processes and experiences. Health care workers need to individualize pain management strategies since reaction to childbirth pain differs from person to person. The health care providers also need to understand the cultural orientation of women

during childbirth and offer methods that are culturally acceptable and safe. An efficacy enhancing educational intervention program is the best option.

2.5 Women's views on childbirth pain

Khamehchian, and colleagues (Khamehchian *et al.*, 2020) reported that being expectant and giving birth were issues of importance to women. Women described the childbirth process and expressed that the expectations should be real. Fewer women have expressed a more anticipating attitude towards childbirth and an overall acceptance that pain and other accompanying challenges are related with childbirth. These findings compare with Chilee and colleagues (Chilee *et al.*, 2020) who also found that few women regarded labour pain as a physiological event and anticipated to face it as initiated by God. The women also felt that pain bonds them with their baby and gives them the right of possession to the child. They related pain with care alluding that achieving something without pain can make one to be careless. The perception of labour as a natural unavoidable process assists women to put up with the pain. This does not imply that labour pain relief should be ignored since women still express pain in the usual physiology of labour; hence the need to enhance coping strategies. The educational intervention program addresses these needs.

2.6 Self-efficacy during childbirth

Currently, childbirth self-efficacy is known as an important process of women's reliance in their ability to manage childbirth. Additionally, childbirth self-efficacy has a significant impact on the woman's overall experience with childbirth by practicing coping behaviours and resilience to cope with any uncertainties associated with birth (Soh *et al.*, 2020). A recent study in Indonesia examining the association

between self-efficacy with birth complications revealed that mothers who had poor self-control and low self-efficacy had more risks of developing childbirth complications relative to those who had high self-efficacy. Moreover, the findings of the study suggest that antenatal health care providers should prepare mothers from pregnancy to childbirth to enable them to have high efficacy during childbirth (Ramie and Mahdalena, 2023). In Uganda, less satisfaction with prenatal care, lack of social support to women during delivery, use or intention to use herbal medicine by pregnant women was associated with low self-efficacy during birth (Shimpuku *et al.*, 2019).

Previous studies found out that women who attended antenatal course had scanty information availed to them concerning techniques such as relaxation and breathing exercises and as a result they are uncertain of using them the way they would have wanted. Although most women take part in numerous antenatal training courses, however, they were still doubtful about many aspects of labour; it was this doubt that was informing their fear for labour. The women in these studies complained that the antenatal educators did not spend much time with them probably only 5 minutes and gave very scanty information about techniques to relieve pain in labour. Neither did the health care providers do any actual practicing of those techniques to the women. It is documented that indeed many of the women reported attending lively antenatal care in readiness for labour. Contrary, the report revealed inadequate knowledge was acquired on pain relief during childbirth (Chilee *et al.*, 2020; Khomehchian *et al.*, 2020). This suggests that the method of relaying information in the present times is unproductive. Therefore, there is need to develop an effective education program to

help women mitigate labour pain and consequently improve maternal and neonatal outcomes.

2.6.1 Socio-demographic factors affecting self-efficacy

There is inconclusive data pertaining to sociological and demographic elements and childbirth self-efficacy. Previous investigations from Turkey to identify factors relating to childbirth self-efficacy among expectant women demonstrated that income status, individual experiences like foetal loss, prenatal education and women's perceived efficacy had an effect on childbirth self-efficacy (Bostan *et al.*, 2022). Other studies in Singapore have also revealed a significant association between ethnicity, parity, previous birth mode, fear of childbirth and psychological well-being and childbirth self-efficacy (Soh *et al.*, 2020). Moreover, perceived spousal support was also identified as a factor that affected birth self-efficacy positively and it was recommended that midwives should support this idea during pregnancy and childbirth (Bostan *et al.*, 2022; Kucukkaya *et al.*, 2023).

Increased self-efficacy outcome have been linked with better psychosocial adjustment after childbirth and powerful identification with the responsibility of motherhood. Childbirth self-efficacy among women may be inclined more to their state of overall self-confidence, their current coping strategies and firm backing role models. Additionally, internal individual factors may be more convincing than women's demographic factors acquainted with the earlier evidence that pregnancy anxiety was firmly linked with decreased childbirth self-efficacy (Naghdipour Mirsadeghi *et al.*, 2022). Investigations on the role of social support on self-efficacy have not been robust. Shakarami and colleagues (Shakarami *et al.*, 2021), found out

that multi-parous women recorded decreased states of childbirth self-efficacy levels when spouse support was absent in comparison with primi-paras. Earlier experience with childbirth was an added advantage since they were able to remember the significance of a support person to depend on, more so in a demeaning childbirth environment. All women fear being abandoned in labour, additionally absence of support decreases self-efficacy as well as increasing anxiety (Mbwali *et al.*, 2022). In view of the above first-time mothers probably get into labour ward believing they will acquire the necessary care and support from childbirth providers, as such their dependence on a supportive spouse may not always be verbalised.

2.6.2 Effects of childbirth knowledge on self-efficacy

The link between childbirth knowledge and self-efficacy is largely unknown. Prior childbirth experience and increased childbirth education impart positively on self-efficacy (AlSomali *et al.*, 2023). Studies postulate that the past birth knowledge is transferable and that explains why first-time mothers may record decreased childbirth self-efficacy indicators (CBSEI) scores. Shchartz and colleagues (Schwartz *et al.*, 2015) asserts that more evidence is required to link childbirth education with self-efficacy to increase women's confidence during childbirth since knowledge is variable. The current study addressed this gap.

2.6.3 Obstetric factors and self-efficacy

There is scanty data connecting obstetric factors and childbirth self-efficacy. Current studies have linked parity with self-efficacy. High fear of childbirth and low self-efficacy was recorded in Iran among the primi-parous women (Shakarami *et al.*, 2021). A past good birth experience has been related with high self-efficacy while

women who have experienced adverse events like a past caesarean section record decreased self-efficacy (Çankaya andŞimşek, 2021).

2.6.4 Birth mode choice and self-efficacy

Previous studies have reported associations between those who prefer repeat elective caesarean section (ERCS) and decreased self-efficacy scores. Current data support such relationships between self-efficacy and the option of birth mode. Evidence has shown that improving information and awareness about various birth options result to increased numbers of spontaneous vaginal birth (Çankaya and Şimşek, 2021).

2.6.5 Effect of role models on self-efficacy

A study by Gagnon (2021) revealed that women approached childbirth believing in themselves and their potential to give birth. Women showed the feelings of trust and competency to deal with pain and other challenges. There was general acceptance that their good birth experiences were associated to their positive views towards childbirth and life as a whole. Women thought that it was natural to give birth since their grandmothers and mothers had given birth and they had basic view that it would be easy (Gagnon, 2021).

2.6.6 Effect of perceived labour pain and self-efficacy

Pain is always viewed as an important component in the experience of birth. It is definitely one that women concentrate on more than other aspects of childbirth. Previous studies have explored the experiences of pain during birth and the connectedness with assurance about the expected occurrence of labour, delivery and women's' views. Prior studies have shown that decreased pain sensations and less

utilization of drugs during childbirth was associated with increased self-efficacy (Gün Kakaşçı *et al.*, 2021). In addition, there is an association between increased self-efficacy scores and lesser pain sensations (AlSomali *et al.*, 2023).

Past evidence has revealed an association between increased pain perception and decreased low childbirth efficacy. Nevertheless, earlier studies did not find a relationship between mid-trimester pain and childbirth self-efficacy (Schwartz *et al.*, 2015). However, there is an association between second trimester pain and childbirth anxiety. Whether anxiety precedes doubt or doubt prevails and contribute to the association of feeling increased magnitude of pain during pregnancy has not been determined (Koc *et al.*, 2021). The signs may be a request for assistance to endure labour and birth, or as an outcome of anticipated perceptions of inadequate result coping capabilities aggravating usual problems normal of pregnancy. Health professionals should distinguish physical effects and other causes of uncommon discomforts of pregnancy. Beneficial approaches to help women may include strategies that enhance personal resilience (McDonald *et al.*, 2016). Assistance could also be given through a depended health care provider that the woman identifies who directs them during childbirth. Health professionals can also educate women on normal childbirth and help to enhance constructive anticipations and reassurance (Kuo *et al.*, 2022). Women in the present study were grouped in the intervention group (went through an educational intervention program), their scores in self-efficacy compared with control group (those who went through the routine antenatal care) to delineate the impact of supportive strategies.

2.6.7 Effect of psychological factors on self-efficacy

Chen and colleagues (Chen *et al.*, 2023) related melancholy, anxiety, and self-efficacy. These observations are consistent to those of Schwartz and colleagues (Schwartz *et al.*, 2015) who found out that childbirth anxiety, self-efficacy and depressive signs are associated. Considering the negative outcomes of unfavourable perinatal psychological well-being of mothers and their new-borns, enhancing self-efficacy may decrease the incidents of depression. There is a strong association between depression and low self-efficacies in breastfeeding mothers (Gün Kakaşçı *et al.*, 2021). As such, there is need for advocacy for midwives to adopt care approaches where psychosocial matters can be regularly evaluated considering the adverse outcomes on women's self-efficacy for childbirth and other motherly responsibilities. Such modalities should encourage improvement and where recommended, timely transfers for extra care to be initiated. Childbirth anxiety and decreased CBSEI scores in extremely worried women have been documented as causes of posttraumatic stress disorder (PTSD) (Aguilera-Martín *et al.*, 2021).

Childbirth associated trauma is a significant key health challenge considering the extent and long-lasting consequences for the society and family. Ramie and Mahdalena, (Ramie and Mahdalena, 2023) reported that childbirth anxiety scores are associated with decreased levels of first stage labour outcome expectancy scores. It was also highly correlated to low levels of first stage labour outcome expectancy and self-efficacy. Moreover, the anxious women recorded increased outcome expectancy scores, showing that education on childbirth or acquiring support prior and during childbirth improved women's childbirth self-efficacy. In addition, tackling childbirth

anxiety by way of midwifery psycho-education remarkably enhances women's birth confidence (Aguilera-Martín *et al.*, 2021).

2.7 Effect of intense childbirth pain on maternal and foetal outcomes

Anxiety related to childbirth pain is one of the most significant reasons that make women desire for caesarean section. Evidence has shown that panic and worry related to childbirth pain is a major reason for women opt for caesarean sections (Rasool *et al.*, 2021). The women's encounter with labour makes them anticipate the pain with fear, anxiety and always in low moods. This occurs mainly when the progress of labour is slow (Rúger-Navarrete *et al.*, 2023). The demand for proper labour pain relief cannot be exaggerated because labour pain makes the woman exhausted and this could influence her potential to deliver during the second stage of labour (Gagnon, 2021). Khomehchian and colleagues (Khomehchian *et al.*, 2020) reported that feelings of fear, desperation, exhaustion and deprivation of energy are realized over time as the magnitude of the contractions and the pain intensified. All these have potential negative impacts on maternal and neonatal outcomes. Additionally, women expressed the thoughts of despair and were scared to death. Adequate pain control has a potential of alleviating the adverse psychological experiences of women resulting from high tension reactions such as fear or panic from intense labour pain (Bakhteh *et al.*, 2022).

Childbirth pain is influenced by physiological, mental, societal, traditional and surrounding factors. It is awful in nature and quickly intensifies with time (Nguyen *et al.*, 2021). Too much pain increases the mothers' worries and uncertainties during childbirth and at the same time trigger the sympathetic nervous system. These are in

response increased production of catecholamines, such as epinephrine and norepinephrine, consequently leading to leading to increased pain, delayed labour stages, and dissatisfaction with the delivery experience (Rúger-Navarrete *et al.*, 2023). Delayed labour culminates into apprehension worry and exhaustion that culminates in decreased maternal self-reliance and pride. There is an association between prolonged labours and utilization of pharmacologic agents of pain relief. Prolonged labour is also associated with high chances of injury, prenatal deaths, use of oxytocin and increased rates of prenatal mortality and rate of caesarean and instrumental delivery (Rasool *et al.*, 2021). The relationship between lifelong stress and childbirth outcomes demonstrates the importance of modalities to decrease this factor (Hildingsson *et al.*, 2022). Currently, a variety of analgesic and supportive methods are utilised for alleviating labour pain. But due to some problems associated with pharmacological agents on maternal and neonatal health, they are hardly used. Recent evidence suggests use of non-pharmacological methods of pain relief in labour with supportive care being fronted as being effective (Cabral *et al.*, 2023).

A study in conducted on Iranian women on the impact of birth plans integrated into childbirth preparation classes on maternal and neonatal outcomes revealed that the spontaneous vaginal birth rates were higher in women possessing birth plans compared with those without, additionally their lengths of first and second stages of labour were shorter, they were more satisfied with the process of childbirth and initiated breastfeeding much earlier than the control group (Mohaghegh *et al.*, 2023).

Maternal self-control and self-efficacy reduced the risks of developing complications of childbirth in Indonesia (Ramie andMahdalena, 2023). The effects of antenatal

education on maternal and neonatal outcomes have been documented by several authors; for example, in Turkey, more vaginal births, lower depression, anxiety and stress symptoms were recorded in the antenatal education group compared to the controls. In Korea lower caesarean births and decreased use of analgesia was documented, though there was no difference in the groups in anxiety and depression (Hong *et al.*, 2021). In Tanzania, a family oriented antenatal education program recorded fewer caesarean sections, less neonatal complications, less bleeding and seizures during labour and birth (Shimpuku *et al.*, 2019).

2.8 Women's experiences with labour pain

Women have previously categorised the magnitude of labour pain as it increased with time from the beginning of contractions to full dilatation of the cervical opening as sharp, severe, terrible or unbearable (Chilee *et al.*, 2020). When labour begins the pain comes irregularly with signs of abdominal cramps, pelvic discomfort and backache. Other studies have also reported that the only experience that women can remember about childbirth is severe pain (Khomehchian *et al.*, 2020). Few women rated childbirth pain as a positive experience while majority of them regarded it as the worst encounter they have ever undergone (Ghanbari-Homaie *et al.*, 2021).

In addition, a previous research on women's experience of pain during labour in Iran indicated that most mothers described delivery pain as hard to endure, unbearable and indescribable, and that childbirth pain was the most agonizing pain that they have ever tolerated (Romanenko *et al.*, 2022). The findings of this particular study also indicated that the number of patients who rated their pain as unbearable was greater compared to a few numbers who evaluated it as feeble or mild. Moreover, a

study in Kenya evaluating women's anticipation and encounter with labour indicated that majority (80%) had longer and unbearable pain and also expressed their pain as agonizing, harrowing and torturing (Ouma, 2022). It is probable that these findings are due to lack of childbirth education during pregnancy. To this end, a study on sensation of childbirth pain in Kenyan rural women revealed that few mothers (29.8%) received any childbirth education from health care workers during the routine antenatal period. In turn, a majority of the women (73.8%) rated their pain as severe to unbearable (Oluoch-Aridi *et al.*, 2021). It is hoped that findings from this current study would help in advocating and implementing an educational program to help mothers cope well with high intensity pain through the non-pharmacological ways of pain relief and increasing knowledge on self-efficacy during childbirth.

2.9 Effect of Educational intervention programs

Accumulating evidence suggests that some educational interventions have proven to be effective in relieving or coping with pain, fear and anxiety during labour, promoting self-efficacy as well as enhancing positive experiences among women. The antenatal educational program in China improved self-efficacy and reduced pain perceptions among first time mothers (Wan-yim .ip *et al.*, 2009). In the United States, Mindfulness Childbirth Education during antenatal care proved to have significant maternal psychological health benefits to include better childbirth related appraisals, less postpartum depression signs and limited use of pharmacological agents during childbirth (Babbar *et al.*, 2021). Similarly, in Turkey a 6week antenatal period impacted positively on maternal self-efficacy and enhanced maternal role adjustments (Gün Kakaşçı *et al.*, 2021). Fear of childbirth anxiety and depression

was significantly reduced in women who attended antenatal education in Spain and Taiwan (Aguilera-Martin *et al.*, 2021; Kuo *et al.*, 2022).

In India, spontaneous onset of labour, increased vaginal births, short periods of labour and less need for interventions were positive outcomes associated with antenatal education (Karkarda *et al.*, 2023). Positive childbirth experiences and enhanced maternal health was achieved through childbirth education programs in Saudi Arabia (Alkhumizi and Alhamidi, 2023). In Ethiopia, high level of knowledge on the procedures of labour and childbirth was associated with decreased negative emotion and reduction of experienced pain (Haso *et al.*, 2021). Fewer cases of bleeding and seizures were documented during labour for mothers who went through family oriented antenatal care in Tanzania (Shimpuku *et al.*, 2019). Sufficient information on labour and coping strategies impacted positively on women's experiences during childbirth in Nigeria. The above evidence necessitates the incorporation of structured antenatal education programs to improve maternal and neonatal outcomes.

However, little attention has been given to the aspect of fear, anxiety and pain during childbirth in majority of health care facilities in Kenya. Evidence from previous studies in the Kenyan public hospitals have revealed that majority of women have experienced longer and more painful labour than anticipated. In addition, most women do not receive any childbirth education during the routine antenatal period (Oluoch-Aridi *et al.*, 2021). A previous study carried out in a tertiary hospital in Kenya among health care workers revealed that majority of the health care providers in maternal health had inadequate knowledge on labour pain management. Poor

protocols and guidelines were also cited as health system barriers (Ouma, 2022) Lack of knowledge on birthing process and ways of coping resulted in perception of high intense pain among mothers with most women describing their pain as agonizing, harrowing and torturing (Waweru –Siika,2019). In view of the above evidence, mothers need to be prepared well on the procedures and coping strategies to enable them have positive experiences of childbirth.

2.10 Summary of the Literature Review

From the above literature review, it is evident that childbirth pain affects a great number of women globally. Most of the women experience extremely painful to unbearable pain and express this in form of crying, yelling, praying to God, while some are stoic due to their cultural influences. Several factors have been identified to affect pain perception in labour either positively or negatively to include, attitude, expectations, motivation, parity, presence of a spouse, attendance of an antenatal class, bitter experience, abnormal pregnancy, knowledge about child birth among others.

Many studies suggest that most women want to be in control during labour, this can be achieved by attending well organized antenatal childbirth classes to prepare them adequately for the stressful process of labour by educating them on the birthing process and self-efficacy during labour. However, from the above literature, most women did not attend any antenatal childbirth classes and few women who attended the antenatal childbirth classes were not sure about many features of labour. Women alluded that health care providers spent little time with them without practicing any of the methods of pain relief and consequently they were not in control during

labour. This implies that there is ineffective delivery of information in the present antenatal care to prepare women for labour. In view of the above, this study aimed at evaluating the impact of an educational intervention program on women's encounter with child birth pain and assesses their self-efficacy levels during labour. As such, women who are not efficacious during childbirth would gain from enhanced support in being capable of learning childbirth coping interventions. In this study, women were assisted by identifying and addressing their fears, individualizing care, determining knowledge and support gaps reinforcing their potential through enhanced knowledge. Vicarious learning and verbal persuasion were also utilised with the hope of improving women's readiness to approach childbirth and its challenges with pain being a significant factor.

CHAPTER THREE

MATERIALS AND METHODS

3.1 Introduction

This section of the study entails the methodology of the study that was followed, study instruments, the intervention of the study as well as ethical principles.

3.2 Study Area

Kakamega County is the most populous County after Nairobi according to the 2019 census with a population of 1,867,579 people with the majority being in the reproductive age. The County has a fertility rate of 3.7 in spite of a decline at the national level from 3.9 to 3.4 from 2008 to 2014 (KDHS, 2022). The maternal mortality rate in Kakamega County is 316 per 100,000 deaths and 19 per 1000 new-borns while nationally its 362 per 100,000 live births and 29 per 1000 new-borns. The rate of teenage pregnancies is also high at an average of 12,900 per year. The County recorded 65,019 estimated pregnancies with 67,127 deliveries majority of the deliveries being physiological through SVD. In view of the above study area characteristics, Kakamega County was considered to be the suitable site for the current study.

Kakamega County has a total of 16 hospitals, 12 government hospitals, and 4 faith-based hospitals, 47 health centres, 38 government and 9 faith-based, 123 dispensaries and 43 clinics majority being private. It has twelve sub-counties that include Kakamega East, West, North, South, Kwisero, Likuyani, Lugari, Matete, Matungu, Mumias East, West and Navakholo. The study was conducted specifically at one level 5 and 4 level 4 health facilities in the sub-counties that offer antenatal, labour

and postnatal services. The facilities were Kakamega County Referral Hospital (KCRH), Butere, Malava, Iguhu, Makunga and Lumakanda Sub-County hospitals. The map on appendix V111 page 113 shows the Kakamega County.

3.3 Study Design

The mixed methods approach was used in this study where both the quantitative and qualitative methods of data collection were used. In the quantitative methods a quasi-experimental design was utilised. This involved the manipulation of the independent variable to observe the effect on dependent variable. Quasi-experimental designs are commonly utilised to describe the causality (impact of independent variable on the dependent variable) in circumstances where investigators are unable to randomly assign the participants to groups or for varied explanations the control group is unavailable for experimentation (Sharma, 2022). In the qualitative approach, phenomenological design was used to explore women's lived experiences with childbirth pain. Phenomenological approach to qualitative research describes the live experiences of people and generates theories or models of phenomena being studied (Sharma, 2022). There was need for qualitative aspect of the study to explore women's experiences and perceptions both in the intervention group and the control group to be able to compare the experiences in the two groups to evaluate the perceptions in regard to the influence of the educational intervention program.

Eligible Mothers at the ANC, Sampled Randomly N=400
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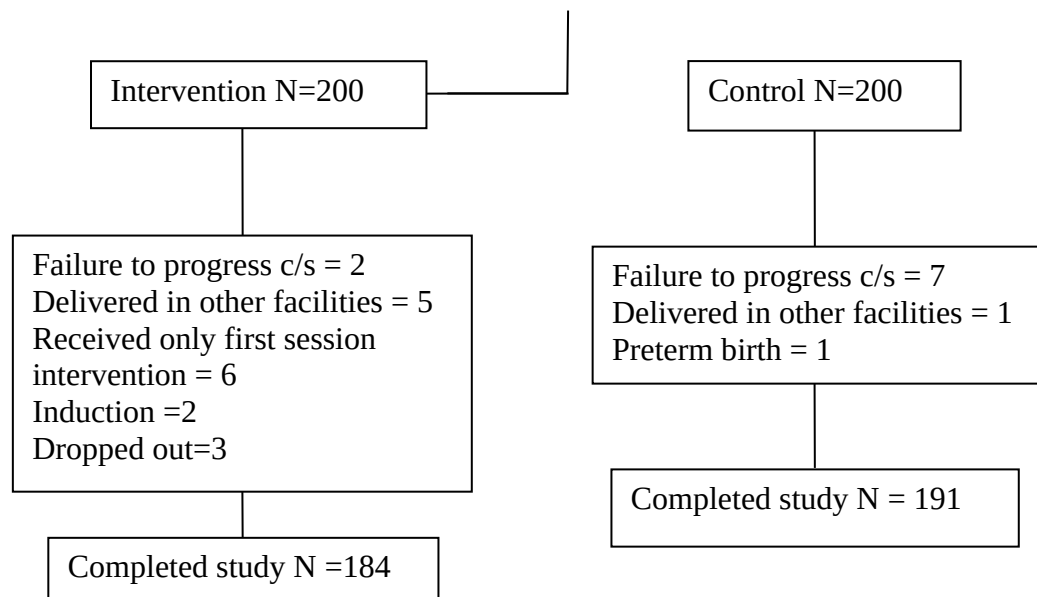


Figure 3.1: Flowchart showing recruitment of pregnant women to intervention and control groups

3.4 Study Population

The study population consisted of pregnant mothers attending antenatal care services at the health facilities in KCRH, Butere, Malava, Iguhu, Makunga and Lumakanda in Kakamega County. Approximately 65,000 mothers attend antenatal care in the county (KCHR, 2021).

3.4.1 Inclusion criteria

The primary inclusion criterion was that participants had low risk pregnancy. The study targeted women with normal pregnancies without complications. Since the intervention was done in the third trimester of pregnancy, mothers ANC records were evaluated as well as physical examination to rule out any complications. Women with birth plans similar to the facility's plan where they had antenatal care because

they were to be monitored, aged 18 years or older, single pregnancies, gestational age between 28th and 32nd weeks because the intervention was performed in the third trimester and targeted women that were about to go into labour. Women whose recommendation was SVD delivery.

3.4.2 Exclusion criteria

Exclusion criteria entailed failure to consent to participate in the study. Pregnancy complications and caesarean section, adverse birth outcomes such as premature birth, congenital birth defects or stillbirth were also excluded from the study due to the emotional stress they were undergoing.

3.5 Sample Size Determination

The sample size was determined using Fischer *et al.*, 1998 formula.

$$n = \frac{z^2 pq}{e^2}$$

Where n=Desired sample size

$z = 1.96$ (standard normal deviation)

p = known character of the study population. Utilization of hospital deliveries in Kakamega County is 70 % (KCHR, 2021).

$p = 0.70$

q = contact usually set at $1 - p$ (0.30)

d = degree of accuracy was set at 0.05

$$\frac{1.96^2 \times 0.7 \times 0.3}{0.05^2} = 323. \text{ Hence the sample size was 323.}$$

Twenty percent (20%) of the sample was added to cater for the attrition rate. This is because the population under study is vulnerable to any complications of pregnancy.

At the beginning of pregnancy, the risk is higher and 40% is recommended (Ip et al 2009) but since the intervention was done in the third trimester, most mothers who did not have major complications were selected and therefore 20% attrition rate. 20% of 323 are 65, so the sample size was 398, approximated at 400

3.6 Sampling Procedure

Kakamega County Teaching Referral Hospital was purposively selected as the only referral hospital serving western region of Kenya. All the eleven level 4 health facilities were listed and given numbers. Simple random sampling technique was used to select five level 4 health facilities from the eleven sub-Counties since all the facilities could not be studied therefore the 5 plus 1 referral were a representation of the county. The simple random technique was used as hospitals were assumed to be homogenous and offered same maternal services across the board and therefore any of the level 4 health facilities stood a chance of being selected. The study was not interested in the evaluation of rural or urban facilities but rather focussed on the intervention of the study. The selected level 4 health facilities were Butere, Malava, Iguhu, Makunga and Lumakanda to add to the KCRH. A total of 400 participants were required and the numbers in each facility were predetermined based on the delivery statistics. Those facilities with theatres were given more participants compared to those without because more clients attended those facilities. The KCRH 70, Butere 70, Malava 66, Iguhu 66, Lumakanda 64, and Makunga 64. The antenatal attendance register had information details concerning maternal socio-demographics and gestational age. It was therefore used to select eligible mothers and numbers assigned to them according to the attended week. The enrolment of cases and controls was done in alternate weeks, i.e. week one could be controls, week 2 cases,

and week 3 controls and so forth until the required sample size was met in each facility. The study categorized half of the mothers to be in the intervention and the other half to be in the control group in each facility. In every week a specific number of mothers were enrolled using simple random sampling technique. All the eligible mothers were of low risk pregnancy and each stood a chance of being selected to participate in the study regardless of their age, parity or educational status hence use of simple random technique. The cases and controls were separated by weeks to minimise the contamination effect. After selection, mothers were contacted through their registered telephone numbers and planned for physical contact where the purpose of the study was communicated and proper screening for eligibility criteria was done. Replacements were done from the register for those who did not meet the inclusion criteria, or those who were not available on phone. Participants were grouped in numbers of 10-15 for easier follow up based on their gestation period. All mothers were given pamphlets that had various educational needs based on whether they were in the intervention or control.

3.7 Study variables

3.7.1 Dependent variables

The dependent variables in this study were the intensity of childbirth pain, self-efficacy among women during labour, maternal as well as foetal outcomes of labour and women's experiences with childbirth pain.

3.7.2 Independent variables

The independent variables in this study included, age, marital status, parity, education status, religion, prior knowledge about the birthing process. Other

independent variables of significance included, ANC attendance, residence, prior knowledge on pain relieving measures, emotional support, emotions and motivation, personal expectations about labour pain, attitude towards the experienced pain, previous experience of labour pain, prediction of pain.

3.7.3 Intervening variables

This included an efficacy enhancing educational intervention program with the aim of increasing knowledge on basic biology of childbirth, means of coping with pain in labour and ways of enhancing self-efficacy during labour. This was done through teaching, mastery experiences, vicarious learning, verbal persuasion, and decreasing fear, anxiety and uncertainty regarding childbirth. The findings were compared between mothers who went through the efficacy enhancing educational program and those who went through the routine standard care to evaluate the impact of the program.

3.8 Data and Information Collection

3.8.1 Training of research assistants

A total 12 research assistants were trained on how to collect data among the participants; these were the Kenya Registered Community Health Nurses. The training involved data collection procedures and how to use the various tools for data collection; for example, reading questions and proper recording of responses on the questionnaire for consistency among interviewers. The intervention program as well as the ethical principles was made familiar to the research assistants.

3.8.2 The standard care group

Antenatal mothers seeking care at the selected health facilities were selected according to the inclusion criteria using simple random technique. The total sample size for this study was 400. Half were in the intervention group and another half in the standard group. Hence, a total of 200 mothers were categorised to be in the standard group. This formed group 1 that was the control group that went through normal routine antenatal care that is offered at the health facilities.

3.8.3 The intervention group

This comprised of mothers seeking antenatal care services at the selected health facilities that were categorised to be in the intervention group. A total of 200 mothers were recruited in the intervention group. This group of mothers went through normal routine antenatal care and additional educational program. The intervention group received two sessions of about 2 hours each of the educational intervention programme between the (31–33) weeks of gestation. All mothers were followed-up and evaluation on outcome measure was conducted before labour for efficacy part and within 48 hours after delivery for other objectives.

3.8.3.1 The intervention

The educational intervention programme purposed to increase self-efficacy among pregnant women, with the anticipation that they would successfully achieve behaviours for coping with stress and pain in childbirth. It comprised of two sessions 2 hours each interactive educational session. Both week days and weekends were utilized to enable working mothers to participate during weekends. Each session was designed in groups of 10-15 mothers for enhanced interaction and discussion.

Performance accomplishments, vicarious experience and verbal persuasion were utilised in the learning based on the self-efficacy theory by Bandura (Bandura, 1977).

Day 1 (Activity 1): Increasing knowledge and motivating participants

This was done through enhancing knowledge and inspiring participants to partake diligently in this process of childbirth preparedness. Mothers attending the antenatal educational program were taught that birth is a normal, natural, and healthy process and were empowered to approach it with confidence. The content of the information included the bio-psychological phenomena of childbirth (labour pain, causes of labour pain, true signs of labour, stages of labour, procedures to expect during childbirth). This was done using power point presentations, charts and pictures.

Day 1(Activity 2): Coping strategies and their demonstrations

The approaches for coping with childbirth pain, and their association with self-efficacy for childbirth were taught. A variety of coping behaviours were taught to include deep inhalation and relaxation technique, distraction, cognitive restructuring of pain, walking, massage and prayer to help participants to control emotional tensions and pain during labour. A demonstration of coping behaviours mentioned above was done. Expectant mothers were required to practice the learnt coping strategies with use of recall aids like notes, photographs and pneumonics.

Day 2 (Activity 3): Return demonstration

All participants were expected to practise the coping strategies and do a back demonstration of the learnt coping strategies.

Day 2 (Activity 4): Vicarious learning

The participants learnt through role models by visualizing a video. Two different expectant women demonstrated coping strategies of pain during labour process.

Day 2 (Activity 5): Mastering of coping competencies

Expectant mothers did verbal contrast to practise the learnt coping strategies with use of recall aids at home and following the teaching sessions i.e. photograph and pneumonics. Pamphlets' summarizing major coping strategies for directing self-rehearsals were given. A practical log for everyday recordings as a way of self-evaluation of their positive result after practice in the belief that competence was achieved through arranged practice was encouraged.

Day 2 (Activity 6): Verbal persuasion

Participants were motivated and appraised for their continued practice. Group discussion on areas of concern during childbirth, sharing experiences what to anticipate during the process of labour (pain, common procedures: vaginal examination (VE), nutrition, positions) was enhanced.

These mothers were followed up and evaluated at the end of pregnancy on the objectives of the study. The control group received usual routine antenatal care which did not have arranged educational childbirth classes. These mothers were followed up and thereafter comparisons were made between the two groups with regard to the study objectives to determine the impact of the educational intervention program.

3.8.4 Data Collection Tools

3.8.4.1 Data Collection Tools

This study utilised both structured and open-ended questionnaires, MC Gill pain questionnaire, Visual Analogue Scale, Childbirth Self Efficacy Inventory and a Likert scale. They were used as explained in the data collection procedure below. An audio recorder was used to record the experiences with pain among women.

3.8.4.2 Reliability of the Tools

Mc Gill pain questionnaire, which has been used severally in studies to measure pain, was modified to suit the current study by removing some aspects of the quality aspect of the pain since mothers were not able to comprehend quality of pain. Childbirth Self Inventory (CBSEI) has been used in Saudi Arabia as well as China and found reliable. The visual analogue scale has been used widely to measure pain in childbirth as well as other areas of pain (Ip *et al.*, 2009; AlSomali *et al.*, 2023). These tools were adapted for the current study.

3.8.4.3 Validity of the Instruments

Content validity of the questionnaire and childbirth self-efficacy inventory was ascertained by experts in the field of care and the supervisors to ensure that the tools truly measured the objectives of the study.

3.8.4.4 Quality assurance

To reduce possible errors and biases, Research assistants were trained to ensure proper understanding of the research procedure, tools and the intervention. Any ambiguities of the questionnaires were rectified through a pilot study prior to the

commencement of actual data collection. Evaluation of the filled-up questionnaires on a day to day basis for completeness and accuracy was done. The same teaching materials were used on participants in the intervention group.

3.8.4.5 Pretesting of the Tools

The pretesting of the research instruments was done at the Vihiga County Hospital using ten mothers attending the hospital's prenatal and perinatal care units. The goal was to identify any discrepancies in the tools and also to estimate the time required for each respondent to complete the questionnaire. Ten mothers were used to represent 10% of the sample to be interviewed in the facility.

3.8.5 Data Collection Procedure

This data was collected between December 2022 and April 2023. All the four objectives were evaluated on the two groups of women and then comparisons were made between the results in the standard care group and the in the intervention group to determine the impact of the educational intervention programme.

Objective 1: *To determine the effect of an educational intervention program on the intensity of childbirth pain among mothers who will go through normal childbirth at the health facilities in Kakamega County.*

a) Intensity of pain

The Visual Analogue Scale (VAS) was utilized to evaluate the intensity of pain among the two groups of women. On a scale of 0-10, mothers' were asked to point and indicate their high intensity pain experienced during labour. This was further

categorized as follows; a range of 0-3 was categorised as mild pain, 4-6 (moderate pain) and 7-10 was severe pain. Individual scores from each participant were recorded then a group mean was calculated. The two means were compared and further analysis was done to establish the association between social demographics factors and the intensity of pain.

The McGill pain questionnaire also evaluated the strength of pain among women based on verbal response as well as looking for aggravating or relieving factors. Women were required to describe their moment of high intensity pain during labour, on a scale of 0-5, where a score of zero meant no pain and a score of five was evaluated as unbearable pain (No pain, painful, very painful, extremely painful and unbearable pain. Individual scores were obtained, then group scores and comparisons made between the intervention group and the standard care group.

In the same questionnaire, mothers were required to state which factors made their pain worse (aggravating factors) and which factors made their pain less intense. This was an open-ended question for mothers in both groups. The findings were compared between the intervention group and the control group.

SELF-EFFICACY

Objective 2: *To evaluate the impact of an educational intervention program on women's self-efficacy during normal childbirth at the health facilities in Kakamega County.*

This objective was determined by the Childbirth Self Efficacy Inventory (CBSEI-16) which was designed by Bandura. The CBSEI-16 has two main items, that is, Outcome Expectation (OE) scores and the Efficacy Expectation (EE) scores. The OE scores on beliefs that executing the behaviour will result to a specific outcome for the individual, while EE scores pertain to the personal perception of trust in their capability to execute or perform a certain behaviour. The CBSEI-16 scale and a five point Likert scale were utilised. The CBSEI-16 scale was utilized to evaluate the childbirth self-efficacy scores before and after the intervention among the two groups of women. It has two items the OE and the EE scale. For the OE Part expectant mothers were to imagine how labour will be and feel having strong and frequent contractions and during pushing of the baby, and how each of the behaviours indicated would help with coping with whole labour process. On a scale of 0-10, mothers were to point and indicate between 1 not helpful at all to 10 very helpful. On the other hand, for the EE scores, mothers were required to imagine being in labour with strong and frequent contractions and during pushing of the baby to indicate how sure or certain they were capable to use the behaviour to help them cope with the entire process of labour by circling a number between 1, not at all sure, and 10, completely sure or certain. The total items to respond to were 16, the total score being 160 highest and 16 lowest. Childbirth self-efficacy was determined by summing up both OE and EE scores. A high efficacy was total score of 80 and above while low efficacy was a total score of below 80. The OE and EE scores had each a highest score of 80. The OE and EE scores were collected before and after the intervention and compared between the intervention and control groups. A five-point Likert scale (0-5) was used to assess the capability, control, fear and anxiety among mothers.

Objective 3: *To examine the influence of an educational intervention program on maternal and neonatal outcomes through normal childbirth at the health facilities in Kakamega County.*

After delivery, all files of mothers under study were taken and evaluated for the following;

Maternal outcomes

a) Length of labour

The length of labour for each participant was evaluated. This was done by examining the history in the file as well as on the individual partograph when true labour started and the time it took for the whole process of labour. For a primi-para time should not exceed 18 hours whereas for a multi-para time should not exceed 12 hours. Beyond the stated time, it was termed prolonged labour. Comparison of this outcome was made between the control and the intervention group to determine which group experienced more prolonged labours.

b) Final mode of delivery

All mothers were expected to deliver by SVD as per the inclusion criteria. The current study established how many ended up with other modes of delivery such as caesarean sections, vacuum delivery or forceps. This was compared between the two groups to determine which one had other modes of delivery other than normal vaginal delivery.

C) Specific complications/interventions that are not emergencies

1. Failure to progress- Mothers who started well, with spontaneous onset of labour but could not progress well and an intervention had to be used for successful birth of the baby; this may include augmentation with oxytocin. Use of analgesia during labour was also be evaluated. This was compared between the two groups to find out which group had more interventions and or complications.

2. Postpartum haemorrhage related to prolonged labour. This was compared between the two groups to see which had more cases of haemorrhages.

Neonatal outcomes

The current study specifically analysed APGAR scores of the neonates, fresh stillbirths, and babies born with asphyxia. These outcomes were evaluated by looking at the files to see the actual documented records on APGAR scores, whether baby born alive or dead and number of asphyxiated babies among mothers in the intervention and the standard group care.

Objective 4: *To establish the effect of an educational intervention program on women's experiences with childbirth pain at the health facilities in Kakamega County.*

A total of 19 women, 7 from the control and 12 from the intervention were asked to describe their experience with childbirth from the time they stated experiencing pain up to the end of delivery using in-depth interviews. They were asked to state how they coped with the experience of childbirth especially coping with pain. Their voices were recorded. Their narratives continued until a saturation point was reached

where no new information was forth coming. Emerging themes were coded and recorded from each transcription and analysed using Clarke and Brawns method of thematic analysis, provided in the Appendix IV.

3.9 Data Analysis

Both quantitative and qualitative methods of data analysis were utilised. Quantitative data collected was analysed quantitatively using the Statistical Package for Social Scientists (SPSS) version 26. Data from filled up and valid questionnaires were entered into an excel data base and processed. Coding of the questions or items and responses was done. Specific responses were computed based on their frequencies and proportions from the study participants. Descriptive statistics were presented in tables. Frequencies were tabulated for categorical variables, while mean, median, range and standard deviation were utilised for the continuous variables

For objective one, the means of the pain scores in the two groups was compared using an independent t-test. Multivariate logistic regression was utilised to determine the factors associated with severe and unbearable pain

For objective two, the means of the childbirth self-efficacy scores OE and EE both pre and post scores in the two groups was compared using an independent t-test. The mean scores for the two groups on the various aspects on the Likert scale was obtained and tested for significance using an independent t-test.

For objective 3, the Chi square (χ^2) test for proportions and the independent t-test were used to determine the statistical difference between the two groups. The

confidence interval was set at 95% ($p \leq 0.05$). P values of ≤ 0.05 were considered statistically significant.

For objective 4; the emerging themes were coded and analysed thematically. The audio recorded data was reviewed by 3 researchers, translated from Kiswahili to English and back to ensure that meaning was not distorted. Earlier concepts that emerged were discussed and coding was done to identify characteristics of words or statements that were associated with the objective of the study. All codes were examined and comparison made to clarify associations and sorted into sub-themes then themes. Analysis framework for coding and analysing qualitative data is provided in the Appendix V.

3.10 Ethical Considerations

Ethical clearance was sought from the Institutional of Research and Ethics Committee (IREC) of Masinde Muliro University of science and technology, National Commission for Science and Technology (NACOSTI), Kakamega County office and the specific health facilities. Study participants were briefed about the study objectives and informed consent was obtained. Participation was on voluntary basis and any decline did not affect their normal standard of care. Future benefits of the study were communicated to the participants. Anonymity was practised where names of the participants were not used but rather the numbers were assigned to the participants based on the facility and letters C or I accompanied the number to put them either in control or intervention. Privacy and confidentiality were adhered to by ensuring mothers were interviewed in private rooms and their information was kept private. The facilities provided well-lit rooms for teaching and discussions. The data

collected was kept under lockable cabinets for safe custody. The results of the study and recommendations would be communicated to the specific hospitals management team and the county office dealing with health. Appendixes VI, VII, VIII provide the approval documents.

CHAPTER FOUR

RESULTS

4.1 Socio- demographic characteristics of the study participants

The socio-demographic characteristics of the study participants are summarized in Table 4.1. Three hundred and seventy-five mothers participated in the study (375), 25 mothers were lost due to various reasons as indicated in figure 3.1 in the methodology section. The median age was 24 years, majority were married (73.1%), Christians (93.9%), having attained secondary education (45.3%), not employed (56.6%), attended more than four antenatal visits (79.2%), multi-para (52.2%) and had planned pregnancies (56.8%). There was no statistical difference between the intervention group and the control group, indicating that the groups were homogenous at the onset of the study.

Table 4.1: Socio-demographic characteristics of the study participants

	Study Groups		
Parameter	Control	Intervention	<i>P</i> value
Age Median (IQR)	24.00 (8)	25.00 (9)	0.113 ^a
Marital status			
Single: n (%)	54(28.3)	44(23.9)	0.143 ^b
Married: n (%)	137(71.7)	137(74.5)	
Separated: n (%)	0 (0)	3(1.6)	
Divorced: n (%)	0(0)	0(0)	
Widowed: n (%)	0(0)	0(0)	
Religion			
Christian; n (%)	176 (92.1)	176 (95.7)	0.151 ^b
Muslin; n (%)	15 (7.9)	7 (3.5)	
Hindu; n (%)	0 (0)	1 (0.5)	
Others; n (%)	0 (0)	0 (0)	
Education level			
None; n (%)	0(0)	4 (2.2)	0.100 ^b
Primary; n (%)	58(30.4)	52 (28.2)	
Secondary; n (%)	92 (48.2)	78 (42.4)	
Tertiary; n (%)	41 (21.5)	50 (27.2)	
Employment status			
Student; n (%)	29 (15.2)	23 (12.5)	0.628 ^b
Not employed; n (%)	107 (56)	105 (57.1)	
Casual; n (%)	14 (7.3)	10 (5.4)	
Permanent; n (%)	4 (2.1)	8 (4.3)	
Self-employed; n (%)	37 (19.4)	38 (20.7)	
No. of ANC visits			
Less than 4; n (%)	39 (20.4)	39(21.2)	0.853 ^b
Four and above; n (%)	152(79.6)	145 (78.8)	
Parity			
Primi–para; n (%)	75 (39.3)	73 (39.7)	0.995 ^b
Multi-para; n (%)	100 (52.4)	96 (52.2)	
Grand multi-para; n (%)	16 (8.4)	15 (8.2)	
Pregnancy planning			
Planned; n (%)	104 (54.5)	109(59.2%)	0.349 ^b
Not planned; n (%)	87 (45.5)	75 (40.8%)	

Data presented as n (%) unless otherwise stated. ^aStatistical difference determined by Mann-Whitney tests; ^bStatistical significance determined by Pearson Chi-Square tests.

4.2 Objective 1: Effect of an educational intervention programme on the intensity of childbirth pain

The Visual Analogue Scale (VAS) was utilized to evaluate the intensity of pain among the two groups of women, those who went through normal antenatal care plus an educational intervention program and those in the control group who just received normal antenatal care. On a scale of 0-10, mothers were to point and indicate their high intensity pain experienced during labour. This was further categorized as follows; a range of 0-3 was categorised as mild pain, 4-6 moderate pain and 7-8 was severe pain and 9-10 as excruciating or unbearable pain. Table 4.2 shows the means of the two groups as compiled using the visual analogue scale. The group without the educational intervention program had a mean of 9.03(0.77) interpreted as excruciating or unbearable pain compared to a mean of 7.53(0.77) in the intervention group, interpreted as severe pain, $P<0.001$. This shows an overall significant positive effect of the educational intervention program on childbirth pain. That mothers in the intervention group experienced lesser pain compared to those in the control group.

In order to validate the above observations, the study further assessed the intensity of pain using the McGill pain questionnaire. Women were required to describe their moment of high intensity pain during labour, on a scale of 0-5, where a score of zero meant no pain and a score of five was evaluated as unbearable pain (No pain, painful, very painful, extremely painful and unbearable pain. The results presented herein, reveal that those mothers who did not have an educational intervention program had a mean score of 4.33(0.043) indicating extremely painful and excruciating pain. Those who went through an educational intervention program had a mean of 3.88(0.48) indicating very painful pain, $P<0.001$, suggesting a significant

relationship between the educational intervention program and the perceived strength of pain.

Table 4.2: Effects of education intervention on intensity of childbirth pain

Parameter	Control	Intervention	P value
Visual pain	9.03 (0.077)	7.53 (0.077)	<0.001
Pain strength	4.33 (0.043)	3.88 (0.48)	<0.001

Data presented as mean (std error of mean). Statistical significance was determined by independent t tests.

To validate the quantitative aspect of the intensity of pain the qualitative aspect revealed the following. One mother in the intervention group reported;

“My experience was fairly good, the pain was severe but manageable, I practiced what I was taught, and it really helped. I gave birth well” (KCTRH109).

While that in the control group reported the following;

“I had worries the pain was too much, I could not do anything, you become like a mad woman” (MLVC14)

This clearly indicates that those in the intervention group practised the methods of coping that they were taught and were able to manage their pain well compared to those in the control

Further analysis on the factors associated with severe pain and/or the unbearable pain are presented in Table 4.3 from the visual analogue scale. These analyses revealed that the non-intervention increased severe pain [OR=3.099, 95% CI (1.080-8.887), $P=0.035$], and unbearable pain [OR=27.930, 95%CI (9.354-83.399), $P=<0001$], while permanent employment reduced unbearable pain [OR=0.038 95% CI (0.003-0.549), $P=0.016$]. None of the other factors significantly impacted on the severity of pain.

Table 4.3: Factors Associated with severe and unbearable pain on the visual analogue scale

Factor	Odds ratio	95% CI	P value
Severe pain			
No intervention	3.099	1.080-8.887	0.035
Primi para	1.023	0.146-7.148	0.982
Multi para	1.565	0.354-6.920	0.555
ANC visit <4 visits	0.993	0.373-2.638	0.988
Occupation			
Student	2.085	0.432-10.049	0.360
Unemployed	1.694	0.607-4.723	0.314
Casual labourer	0.643	0.117-3.543	0.612
Permanent employment	0.480	0.088-2.626	0.397
Education level			
No education	0.438	0.026-7.434	0.568
Primary	0.670	0.190-2.359	0.533
Secondary	1.137	0.353-3.655	
Unbearable pain			
No intervention	27.930	9.354-83.399	<0001
Primi para	1.253	0.148-10.604	0.836
Multi para	0.950	0.183-4.939	0.951
ANC visit <4 visits	0.993	0.346-2.851	0.989
Occupation			
Student	0.625	0.116-3.363	0.584
Unemployed	2.241	0.732-6.859	0.157
Casual labourer	1.407	0.230-8.600	0.711
Permanent employment	0.038	0.003-0.549	0.016
Education level			
No education	0.580	0.024-13.947	0.737
Primary	0.313	0.081-1.214	0.093
Secondary	0.715	0.209-2.444	0.593

Data are presented as odd ratios (OR) and 95% confidence interval (CI) determined by multinomial logistic regression analyses

4.3 Objective 2: Influence of a training intervention program on childbirth self-efficacy

The Childbirth Self Efficacy Inventory (CBSEI-16) scale was used to determine self-efficacy among pregnant women both in the intervention and the control group. **Table 4.4** shows the means of the two groups as compiled using the CBSEI-16 scale. The pre-test (before birth) results indicate that Outcome Expectancy (OE) mean in the control group was [mean $\pm$ std err. (25.47 $\pm$ 0.470)], and in the intervention group (25.27 $\pm$ 0.492), $P=0.769$, were comparable. Similarly, the pre-test Efficacy Expectancy (EE) mean in the control group (21.21 $\pm$ 0.399) and the intervention group (21.16 $\pm$ 0.407), $P=0.935$, were also comparable. A training intervention program was offered to the intervention group. All mothers were followed up and a post-test (after birth) given at the end of the 36th week of gestation. The results of the post-test OE score Control (38.66 $\pm$ 0.693) were lower than post-test OE scores in the intervention group (68.88 $\pm$ 0.456), $P<0.001$. However, post-test EE scores for control (32.24 $\pm$ 0.498) were more than two-fold lower than those of post-test EE scores Intervention (74.92 $\pm$ 0.255), $P<0.001$. Collectively, these results suggest that the training programme increased the self-efficacy of the mothers.

Table 4.4: Influence of a training intervention program on childbirth self-efficacy

Parameter	Control	Intervention	P value
OE Score (Pre)	25.47 (0.470)	25.27 (0.492)	0.769
OE Score (Post)	38.66 (0.693)	68.88 (0.456)	<0.001
EE Score (Pre)	21.21 (0.399)	21.16 (0.407)	0.935
EE Score (Post)	32.24 (0.498)	74.92 (0.255)	<0.001

Data presented as mean (std error of mean). Statistical significance was determined by independent t-tests.

To explain further the difference in the efficacy scores above, the qualitative aspects of mothers revealed that those who were in the intervention practised various methods of coping and therefore felt more capable compared to their counterparts. A participant in the intervention had these to say:

“I came with my phone, I was able to play games and watch movies, the hope to see my child gave me strength. During pushing I used breathing and relaxing techniques” (IGHI07).

On the contrary a participant in the control said;

“I just kept quiet, just slept on the bed I did not attempt to do anything” (MLVC13).

4.3.1 Effects of training intervention on the psychological state of pregnant women

In addition, the impact of the education programme was also evaluated in terms of the psychological states of pregnant mothers. This was evaluated with special emphasis on their response to anxiety and fear. Table 4.5 shows the mothers response to anxiety, fear and other psychological factors. The results show that mothers in the intervention group felt more in control during labour and were more capable to withstand pain, and their birth process proceeded as largely as was expected than those in the control ($P<0.001$, for all variables). In contrast, participants in the

control group were more scared and anxious relative to those in the intervention group ($P < 0.001$, respectively).

Table 4.5: Effects of training intervention on the psychological states of pregnant women

Response	No intervention	Intervention	P value
Scared	3.64 (0.082)	2.38 (0.062)	<0.001
Anxious	3.85 (0.077)	2.52 (0.123)	<0.001
Being in control	2.98 (0.065)	3.94 (0.060)	<0.001
Capable to withstand pain	3.01 (0.070)	4.36 (0.049)	<0.001
Birth as expected	3.43 (0.083)	4.54 (0.057)	<0.001

Data presented as mean (std error of mean). Statistical significance was determined by independent t tests.

To further validate the quantitative results on the above objective the qualitative results from mothers was recorded both in the intervention and control. One mother in the control stated;

“I was so anxious and tensed, it reached a point I was so exhausted, I could not manage” (LMKC23).

Another mother in the intervention stated;

“I had courage. I did not fear because you educated and encouraged us. The hope to see my child kept me pushing on. The pain was severe but I was able to go through it knowing it will end” (MKGI1).

This demonstrates that mothers in the intervention were less anxious and fearful compared to mothers in the control.

4.4 Objective 3: Influence of an educational intervention programme on maternal and neonatal outcomes

The impacts of the educational intervention programme on maternal and neonatal outcomes are presented in Table 4.6. Results presented here indicate that maternal and neonatal complications were less in the intervention group relative to the control group. About 12% of mothers had prolonged labour in the control group compared to 2.2% in the intervention group ($P<0.001$). Mothers who experienced progression failure were 8.9% in the control compared to 1.1% in the intervention group ($P=0.001$). Additionally, 11% of mothers in the control group were augmented compared to 2.7% in the intervention group ($P=0.004$).

With regard to neonatal outcomes higher APGAR scores were higher in the intervention group at 1 and 5 minutes compared to the controls ($P<0.001$). Furthermore, the intervention group had less cases of birth asphyxia 1.6% compared to 5.8% in the control ($P<0.001$).

Table 4.6: Influence of an educational intervention programme on maternal and neonatal outcomes

Outcome	No intervention	Intervention	<i>P</i> value
Maternal outcomes			
Length of labour			
Normal n (%)	168 (88)	180 (97.8)	<0.001 ^a
Prolonged n (%)	23 (12)	4 (2.2)	
Complications			
No complication n (%)	168 (88.0)	180 (97.8)	0.001 ^a
Progression failure n (%)	17 (8.9)	2 (1.1)	
Postpartum n (%)	6 (3.1)	2 (1.1)	
Other interventions			
None n (%)	170 (89.0)	178 (96.7)	0.004 ^a
Augmentation	21 (11.0)	5 (2.7)	
Neonatal outcomes			
APGAR Score			
1 minute	8.06 (0.061)	8.79 (0.040)	<0.001 ^b
5 minutes	9.02 (0.045)	9.76 (0.039)	<0.001 ^b
10 minutes	9.92 (0.029)	9.97 (0.12)	0.077 ^b
Birth outcomes			
Alive and well n (%)	180 (94.2)	181 (98.4)	0.035 ^a
Born with Asphyxia n (%)	11 (5.8)	3 (1.6)	

Data presented as n (%) or mean (std error of mean) as stated. ^aStatistical differences determined by Chi-square tests; ^bStatistical differences determined by independent t-tests.

The qualitative aspect from mothers both in the intervention and control supports the above findings. A participant from the control group verbalised the following;

*‘My labour was prolonged and I bled profusely after birth, was very scared I was going to die; I received a lot of fluid through my vain’
(IGHC7)*

Another one from the intervention confirmed;

‘My baby came out well, he was able to cry immediately, my labour was manageable and I gave birth well’ (LMKI11)

This confirms that mothers in the intervention had favourable maternal and neonatal outcomes compared to their counterparts

4.5 Objective 4: The effect of an educational intervention program on women's experiences with childbirth pain

The current study explored the effects of the educational intervene program on women's experiences with normal childbirth with emphasis on pain experience. Both mothers who attended the program and those who were in the control were asked to narrate how their labour started till the end of delivery. "Please tell us how your labour started till the delivery of the baby". The summary of qualitative analysis is provided in the appendix section V111, 1X. In both groups 4 common themes were identified.

4.5.1 Recognition of labour signs

All mothers in the intervention and the control group were able to recognize the signs of labour to include, lower abdominal pains, back pain, breaking of the waters, thick discharge among others

"Pain was there from 8-9 months but this time it was persistent accompanied with thick mucoid discharge" (KCTRHI25)

"I felt heaviness in the lower part and lower back pain knew I was in labour" (IGHC 03)

4.5.2 Informing the significant others and need for company

Mothers in both groups had the urge to tell people around them about the beginning of labour or how they were feeling. These were their spouses, mothers, mother in-law, sister in-law, neighbour, cousin or the person who will accompany them to the health facility.

“I told my mum about it because I had to go with her to the facility”

(MLVI02)

“I told my husband about the broken waters; he had to start preparing”

(IGHC05)

4.5.3 Characteristics of pain and decision to reach the health facility

Most mothers described their pain as on and off, increasing in frequency and intensity as time went by. Most mothers did not go immediately to the health facility but waited until the pain increased to certain intensity.

“The pain was coming and disappearing, I went on with my chores until it was worse, I had to be taken to the hospital” (BTRC09).

“The pain was on and off, I was just breathing through my mouth then suddenly it was severe I had to go to the facility” (LMKIO4).

4.5.4 Coping strategies with pain

However, there were some differences in the coping strategies of pain between the two groups. Mothers were asked to describe the methods they adopted to cope with pain during labour. “Which methods did you use to cope with labour pains?” Mothers in the intervention group had various ways of coping to include, walking, body relaxing, encouraging self, breathing techniques, distractions, thinking and hoping to see the baby and massage among others.

“I was able to have a breath, walk around, read what was on the wall, when the pain was too much I just had deep breaths, this was like an exam so you have been practicing along and the last day you have to pass the exam” (MKGI 06).

“I came with my phone, I was able to play games and watch movies, the hope to see my child gave me strength. During pushing I used breathing and relaxing techniques” (IGHI07).

On the contrary mothers in the control group had few methods of coping such as walking around and massages were the two common methods.

“I was rubbing my back I just endured; there was nothing I could do” (BTRC 18).

“I just kept quiet, just slept on the bed I did not attempt to do anything” (MLVC13).

Mothers in both groups also described their experience with childbirth pain. Mothers in the intervention group had different ways of thinking about childbirth, deep sense of calmness, relaxed, inspired and motivated with a positive outlook. They felt capable and empowered to go through the process of childbirth.

“My experience was fairly good, the pain was severe but manageable, I practiced what I was taught, and it really helped. I gave birth well KCTRH109).

“I had courage. I did not fear because you encouraged us. The hope to see my child kept me pushing on. The pain was severe but I was able to go through it knowing it will end” (MKG11).

However, those in the control group felt powerless, feelings of fear and anxiety,

exhaustion, feelings of madness, felt high intense pain, not in control and majority had negative experiences

“I had worries the pain was too much, I could not do anything, you become like a mad woman” (MLVC14).

“I was so anxious and tensed, it reached a point I was so exhausted, I could not manage” (LMKI23).

“With time my strength diminished and I was powerless” (BTRC02).

Those mothers in the intervention group were also asked to relate the educational intervention program with their experience with childbirth pain. Majority agreed that the program assisted them to cope with pain they felt more capable though the pain

was severe, changed their thoughts about birth mode and felt others should also be taught the same as it assisted them to cope well.

‘The teachings really helped me, initially I had wanted to go for a caesarean section but after the teachings I changed my mind and opted for a vaginal delivery’ (KCRHI03).

“The teachings gave me strength and encouragement. I did not feel helpless at any one point during childbirth; others should also be taught the same” (LMKI27).

CHAPTER FIVE

DISCUSSION

5.1 Objective 1: Effect of an educational intervention program on the intensity of childbirth pain

The study established the effect of an educational intervention program on the intensity of childbirth pain. The current study established that mothers who undertook an educational intervention program experienced lesser pain as revealed by both the visual analogue scale and the McGill pain questionnaire compared to those who did not go through the intervention. This could be attributed to the fact mothers who went through the intervention were more knowledgeable on the childbirth process and practised various non-pharmacological methods of pain relief compared to their counterparts in the control group. This is because the intervention targeted to increase knowledge on childbirth and performance of various non-pharmacological ways of pain relief. In addition, uncertainties fear and anxiety issues were also addressed by the intervention.

According to the self-efficacy theory mastery experiences though practise in the intervention group could have enabled these women to acquire various competencies to cope with ease and therefore increased their pain threshold. These results corroborate findings of study conducted in China among first time mothers that proved an educational intervention program was effective in increasing pain threshold among mothers who went through the educational intervention program than those in the control group during the early and middle stages of labour (Ip *et al.*, 2009).Comparatively, Mindfulness Childbirth Education in the United States had a positive impact on pain reduction in labour and less use of pharmacological agents

(Babbar *et al.*, 2021). In the current study however use of pharmacological agents was not evaluated since it is hardly used unlike in the former study where most mothers request for pharmacological agents in labour.

Further proof for effective interventions in childbirth pain was demonstrated in Iran, where Transcutaneous Electrical Nerve stimulation (TENS), aromatherapy from Lavandula and natural physiologic birth without intervention were evaluated, the report indicated that childbirth pain was significantly less in the two interventions compared to natural physiologic birth (Mohavedi *et al.*, 2022).

The strength of pain was also evaluated using the McGill pain questionnaire, the results reveal that those who were in the intervention group described their strength of pain from painful to very painful compared to those in the control group who received standard care who described their strength from very painful to unbearable pain. This could be attributed to the fact that those who went through the intervention program were psychologically prepared that pain was part of the delivery process and viewed it as necessary and useful pain as it culminates in the birth of the baby. Mothers in the intervention group had also practised various methods of pain relief which they could have utilised and therefore higher pain threshold than their counterparts who may have viewed pain as pathological and destroying and had less methods of coping with pain. The results in current study compare with those of studies done in Ethiopia where high level of knowledge on the procedures of labour and childbirth was associated with decreased negative emotions and a reduction in experienced pain (Haso *et al.*, 2021).

Furthermore, the support for childbirth education has also been fronted by recent investigations, which revealed that motivated and relaxed women experienced less intense pain (Navarro-Prado *et al.*, 2023). Previous studies conducted in the Kenyan context have revealed that most women are anxious, lack knowledge on the birthing process and ways of coping with pain hence experienced high intensity pain (Waweru-Siika, 2015; Oluoch-Aridi *et al.*, 2021). This is a plausible explanation on why the mothers in the control group experienced high intensity pain both on the visual analogue scale and the McGill pain questionnaire. There is therefore need to come up with effective labour pain measures to support women during childbirth.

The outstanding factor in this study that influenced the perception of severe and unbearable pain was being in the no intervention group. Mothers in the control group did not receive any organised lessons to increase their knowledge on childbirth and demonstrate coping mechanisms prior to labour. It is also assumed that they were more anxious, fearful and felt less efficacious compared to their counterparts in the intervention group who were taught otherwise. Contrary to these findings, Kuciel and colleagues (2021) in Finland noted that attendance of pregnancy classes did not affect pain perception (Kuciel *et al.*, 2021). Important to note in this particular study is that, the number of women attending a pregnancy course was extremely low and as such may not have yielded significant difference in pain perception since it was during COVID-19 pandemic period. Unlike in this current study where majority of mothers were recruited into the program and therefore the results were significant. This implies that the educational intervention program was effective in equipping mothers with necessary knowledge on childbirth and coping skills that resulted in reduced pain intensity during childbirth.

In pregnancy and labour, identified factors such as complicated pregnancy, parity, inadequate knowledge, bad incident of the earlier pregnancies, motivation, satisfaction composure and general anxiety as factors that can impart variability in the magnitude and quality of experienced pain (Romanenko *et al.*, 2022). This study also explored the socio-demographic factors and pain perception. Parity was another factor of importance that influenced the perception of pain in this study. Multi-paras were more likely to experience severe pain compared to the primi-gravidas, on the contrary the primi-gravidas had an increased chance of experiencing unbearable pain compared to the multi-paras. The difference in the intensities of pain disregarding the intervention could be attributed to the fact that multi-paras had prior experience and may have been more confident compared to the first-time mothers. Additionally, having prior experience of childbirth for multi-paras may have influenced their desire to be more knowledgeable and competent in the methods taught since they could relate more with the actual experience compared to first time mothers who just imagined the pain scenarios. However, there was no statistical significance on the influence of parity and experience of pain. These results are consistent with those in Iran where parity and partner did not affect pain perception (Nguyen *et al.*, 2021). There is however need to separate do more education and practise among primi-paras since their pain threshold was low compared to the muliti-paras.

In addition, attendance of antenatal care visits was not a predictor of pain perception in the current study, this could be attributed to the fact that most mothers who visited antenatal care clinics were not adequately taught on childbirth issues. Therefore, they lacked knowledge on pain management and related issues in childbirth. Comparatively, previous findings in the Kenyan setting indicate that most women do

not receive any childbirth education during the routine antenatal period. Majority of women did not practice any methods of pain relief and health care providers left them to labour naturally (Buback *et al.*, 2022). Similar findings were reported by former researchers in England who found that most women who attended antenatal care were still uncertain about many aspects of labour and pregnancy. Women wanted re-assurance and preparation for childbirth including pain management. They alluded that health care providers spent little time with them without practicing any of the methods of pain relief and consequently they were not in control during labour (Spiby *et al.*, 2022). The current antenatal care needs to be reorganised so that important aspects of care like childbirth education and intrapartum care that have been given little attention yet significant are set aside and taught as special programs in order to impact positively on women's self- efficacy and increase pain thresholds during childbirth

Occupation in the current study had a significant influence on severe pain and unbearable pain. Mothers who were students and the unemployed category had increased chances of experiencing severe and unbearable pain. This could be attributed to the fact that they were more anxious and worried about infant care especially the students, the unemployed may have worried about the needs of the infant as evidence has shown that fear and worry is linked to high intense pain (Shakarami *et al.*, 2021). According to the self-efficacy theory, the high arousal of physiological states like fear and anxiety decreases the ability to demonstrate self-efficacy in an individual. The permanently employed were less likely to experience the unbearable pain. This can be assumed that income influences accessibility to information, therefore they were better informed about birthing process and

procedures. Another explanation could be those who had permanent employment had a steady source of income and therefore were not worried about the needs of the baby as they could afford them compared to those who did not have a steady source of income and were worried about the multiple needs of the new baby. Additionally, the permanently employed could have felt more capable and looked more forward to seeing, touching and holding their babies with what they had bought. These thoughts are in line with Maddux 2013 who postulated that imagery experiences or visualization boosts one's self efficacy as individuals are able to see themselves at the end of a particular task or experience. Relaxation and self-confidence has been associated with low intense pain (Cabral *et al.*, 2023).

Lastly, on the education status, mothers who had higher level of education were more likely to experience severe and unbearable pain. This could be attributed to the fact that educated mothers have a lot of expectations including interventions such as pharmacological pain relief. A study done in England confirmed that level of education and occupation are some of the socio-demographics whose influence has not been fully established since pain perception among women may be inclined more to their state of overall self-confidence, their current coping strategies and firm backing role models. Additionally, internal individual factors may be more convincing than women's demographic factors acquainted with the earlier evidence that pregnancy anxiety was firmly linked with increased childbirth pain (Shakarami *et al.*, 2021).

5.2 Objective 2: Impacts of a training intervention program on childbirth self-efficacy

The second objective of the study determined the effect of the educational intervention program on maternal self-efficacy during childbirth. The current study established that at the beginning of the study childbirth self-efficacy in the two groups was comparable. There were no differences in the mean OE and EE scores for pre-test in the intervention and control groups. However, post-test comparison shows that mothers in the intervention group had high levels of childbirth self-efficacy compared to those in the control group. This is ascribed to the fact that those in the intervention group were taught various coping skills and had a chance to practise these techniques. Therefore, they were empowered to use these methods during the process of labour. Enhanced knowledge offered concerning childbirth processes, procedures and expectations could have also boosted their confidence. This was in line with the self-efficacy theory of motivation where mastery experiences were explored and verbal persuasion was employed and mothers were persuaded early before labour that they were capable and will make it through labour.

Contrary those in the control who went through normal standard care may not have been educated more on coping strategies and were incapable of applying any of those methods during childbirth consequently could have felt less efficacious and more vulnerable to the stresses of childbirth. Similar observations have been made in Saudi Arabia where a structured antenatal education was important in providing high quality information and competencies that enhanced maternal self-efficacy during childbirth (AlSomali *et al.*, 2023). This previous study had less participants 94 compared to 375 in the current study. The current study also included multi-paras but

the former study was only conducted in primi-paras. The CBSEI scores in the former study may be of higher values since they utilised a longer version compared to the shorter version utilised in the present study. Additionally, in Turkey, a 6-week antenatal education impacted positively on childbirth attitude, maternal role adjustment and improved level of self confidence among women (Gün Kakaşçı *et al.*, 2021).

More evidence for effective measures to boost self-efficacy in childbirth was reported in Switzerland where skilled breathing and relaxation measures during antenatal education imparted positively on self-efficacy, enhanced self-confidence and perception of being in control during labour (Leuteneggerr *et al.*, 2022), in support of this previous study ,the impact of single prenatal relaxation class promoted knowledge of childbirth physiology and changed way of perception about childbirth and encouraged motivated the practise of the acquired techniques that in turn yielded deep sense of tranquillity and related enhanced confidence and decreased fear (Tabib *et al .*,2021)

Currently improved technology and use of social media platform in Jordian, Middle East to enhance the effectiveness of childbirth education showed that those who were enrolled in the program had improved coping abilities during birth relative to those who were in the control group (Hatamleh *et al.*, 2023). In addition, spiritual counselling has been proven to be effective in enhancing childbirth self-efficacy as a non-pharmacological method (Rabieepoor *et al.*, 2023). Moreover, perceived spousal support is also a critical factor that influences birth self-efficacy positively. For this

reason, it is recommended that midwives should consider this idea during pregnancy and childbirth (Kucukkaya *et al.*, 2023).

The present study also established that mothers who were in the intervention group had less fear and anxiety compared to those in the control group. This is, at least in part, due to the fact that those in the intervention group were taught more about childbirth procedures, methods of coping with pain and what to anticipate during birth. The program also reassured mothers that childbirth was a normal procedure and they should approach it with confidence rather than fear. Any concerns that mothers had were also addressed including increasing knowledge on the physiology of childbirth. This could have given the mothers in the intervention group confidence and they developed more resilience towards childbirth. Improving the physiological states of a person by addressing fear and anxiety before an activity or procedure and ensuring that they are decreased enhances self-efficacy according to the self-efficacy theory.

Those in the control did not have the opportunity to be trained on the process of childbirth and as such were not well equipped with coping strategies during birth. Therefore, as shown by the data presented here, they were more uncertain, more fearful and anxious. Similar findings were reported in Spain in a systemic review to investigate psychological, educational and complementary measures to reduce fear of childbirth among pregnant women. It was affirmed that antenatal education, psycho-education, social support and counselling were effective in reducing fear of childbirth (Aguilera-Martín *et al.*, 2021). However, in the same review cognitive behavioural therapy and some alternative measures needed more investigation as the

evidence was not compelling. The current study employed cognitive restructuring of pain, where mothers were taught to perceive childbirth pain as useful pain since it assisted in cervical dilatation and descent of the baby. It was not destructive or pathological as most mothers thought, but its single effect was not assessed. The results of relaxation techniques were contradictory in the former study, the current study utilised relaxation techniques as well but its single effect was not analysed therefore individual impact may not have been recorded.

Comparatively, a systemic review in Iran on the effect of interventions in relieving fear of childbirth in pregnant women revealed that psychotherapy and education decreased fear of childbirth. Emphasis on pregnancy training and antenatal preparation courses as requirements to empower expectant women to prevent fear of childbirth has been proposed (Bakhteh *et al.*, 2022).

In Taiwan similar results have been recorded using an integrated childbirth education program where fear, anxiety and depression were reduced (Kuo *et al.*, 2022). However, contradictory results were recorded in Turkey where fears of childbirth scores were not significantly different between the intervention group and the control group (Yörük and Acikgoz, 2023). This could be attributed to the fact that all participants were nulliparous and had fear of the unknown despite others going through the antenatal classes that addressed the aspect of fear of childbirth. Fear of childbirth has been singled out as the most common reason why women worldwide prefer caesarean sections. Caesarean births are associated with more bleeding, prolonged healing time, more complications compared to natural births. It is imperative that women of reproductive age should be more educated about child

birth and any fears they have around childbirth dispelled. Inadequate information about childbirth influences the choice of birth mode. With sufficient information women of low risk can choose natural births which are safe and associated with less morbidity and mortality.

5.3 Objective 3: Influence of an educational intervention programme on maternal and neonatal outcomes

The third objective investigated the relationship between antenatal educational intervention program and maternal and neonatal outcomes. Findings indicate that mothers who were in the educational intervention program had less maternal and neonatal complications compared to those in the control group. This could be accredited to the fact that mothers in the intervention group had more self-control and efficacy during childbirth as the programme was designed to empower mothers with knowledge and self-efficacy during childbirth. Adequate Knowledge about childbirth could have enabled mothers to be calmer and allow the physiological process to occur without much resistance in the body and mind hence fewer complications. A comparative study in Indonesia to establish the relationship between maternal self-control and efficacy with childbirth complications revealed that maternal self-control and self-efficacy reduced the risk of developing complications during childbirth (Ramie and Mahdalena, 2023). In the current study the specific complications were established contrary to the previous study that recorded frequencies of the occurrence of the complications.

In the current study, the control group had more cases of caesarean sections. There were few cases of caesarean section recorded in the intervention group compared to the control group. This could be due to the fact that those in the intervention group were empowered with coping skills and had no fear of childbirth relative to the control. This findings compare with those of a recent study in Iran where birth plans integrated into antenatal classes yielded more vaginal births (Mohaghegh *et al.*, 2023). In Turkey, an investigation on the impact of antenatal education on the mode of delivery, showed that those who underwent the education were more likely to give birth through SVD, than those who did not go through the education (Çankaya and Şimşek, 2021). Similarly, in Korea an association between antenatal education and pregnancy outcomes recorded lower rates of caesarean births and decreased use of epidural analgesia in women who had an antenatal education (Hong *et al.*, 2021).

The findings of the presented study demonstrate that there were higher cases of prolonged labours in the control group than in the intervention group. This could be credited fact that the control group had few coping strategies and increased fear that could have led to prolonged labours. Comparatively a recent study in Iran revealed that there were shorter first and second lengths of labour in the group that had birth plans integrated into childbirth classes (Mohaghegh *et al.*, 2023). The current study did not differentiate the first and second stages of labour but rather the whole process of labour. The effect of hypno-birthing training on birth outcomes recorded lower rates of interventions, shorter periods of delivery and increased vaginal delivery rates (Buran and Aksu, 2022).

The current study also established that there was less bleeding in the intervention group compared to the control. This could be attributed to the fact that few mothers had prolonged labour in the intervention as compared to the controls since the study was keen on haemorrhages related to prolonged labours. Similar findings were reported in Tanzania where few cases of bleeding or seizure during labour were documented for mothers who had gone through family oriented antenatal educational program to boost maternal infant birth outcomes (Shimpuku *et al.*, 2019).

Agreeable findings were also recorded in India, on the impact of prenatal breathing techniques on labour outcomes. Mothers in this previous study rehearsed the techniques before labour and during labour. The study recorded spontaneous onset of labour, increased vaginal births, short periods of labour and less need for interventions like augmentation (Karkada *et al.*, 2023). Unlike the current study, the previous study was done among first time mothers only and it was necessary that the mothers practise the techniques daily.

With regard to neonatal outcomes higher APGAR scores were recorded in the intervention group at 1 and 5 minutes compared to the controls. Furthermore, the intervention group had less cases of birth asphyxia compared to the control. Mothers in the intervention group may have utilized more relaxation and breathing techniques that improved maternal oxygenation states and improved neonatal outcomes. Comparable observations were made in Tanzania where less neonatal complications were recorded in the education group (Shimpuku *et al.*, 2019). In Indonesia similar results were recorded where few childbirth complications were documented (Ramie and Mahdalena, 2023). The previous studies though did not record specific

complications of the neonate but Veringa-Skiba and colleagues (2022) recorded higher APGAR scores at 1 minute in the group that had mindfulness childbirth and parenting compared to the enhanced care as usual (Veringa-Skiba *et al.*, 2022).

Contrary to the findings in the current study, there was no recorded difference among the groups on neonatal outcomes for those who had transcutaneous electrical stimulation, aromatherapy of lavandula and natural delivery in Iran (Mohavedi *et al.*, 2022). Similarly, no predefined neonatal outcomes were also recorded in Switzerland on the impact of skilled breathing and relaxation measures on maternal and neonatal outcomes (Leutenegger *et al.*, 2022) More studies need to be done to elucidate the association between antenatal education programme and specific neonatal outcomes.

5.4 Objective 4: The effect of an educational intervention program on women's experiences with childbirth pain

The fourth objective established the effect of the educational intervention program on women's childbirth experience with emphasis on childbirth pain. Women's experience with childbirth pain was explored, common themes were identified both in the intervention and the control group to include; recognizing signs of labour, telling significant others and decision to reach the health facility and the characteristics of pain. This is common teachings done at the Antenatal care clinics and mothers were aware of these signs and when to reach the facility. The experience that women in the current study had was twofold, negative experience for those in the in-control group who did not receive prenatal childbirth teachings and positive experience for those in the intervention group that attended childbirth education and teaching.

Those in the control group without childbirth education had feelings of loss of control, being helpless and feelings of madness with severe and persistent pain. Similar findings were found in Iran where Stress and pain were the major issues identified in normal vaginal delivery among the primi-parous women. In the previous study, women had fear of damage to their babies, damage to their genitals, stressful context of labour ward by screaming women, nauseating feelings, dyspnoea, amnesia, fatigue and imminent death (Khomehchian *et al.*, 2020). Though the previous study was done only in primi-parous women, the current study also included multiparous women as pain differs from pregnancy to pregnancy because past experiences may have an influence. From the above findings, there is need to come up with supportive measures to assist mothers go through the process of birth with empowerment and to enhance positive experiences.

In the current study women in the control group had few coping measures during childbirth hence experienced negative childbirth experiences. A study in Iran confirmed that lack of pain relief options or interventions was associated with negative childbirth experience (Ghanbari-Homaie *et al.*, 2021). In the present study, most women in the control group had fear compared to those in the intervention. Fear of childbirth has been proven as a risk factor for negative childbirth experience and worse obstetric outcomes (Rúger-Navarrete *et al.*, 2023).

Contrary to the above findings, mothers who went through an educational intervention program had a positive childbirth experience with feelings of capability and empowerment during the process of childbirth. This is because they had various ways of coping with pain and described their experience as manageable. Similar

findings were recorded in Iran where birth plan improved childbirth experience and increased perceived support and control in labour. Comparatively, education on childbirth physiology and various relaxation measures positively influenced childbirth experience by empowering and reducing fear; it also impacted different ways of thinking about childbirth and motivated the practice of learnt relaxation techniques (Tabib *et al.*, 2021).

Another study in Saudi Arabia supports the fact that childbirth education programs boost maternal health and promote a more positive childbirth experience (Alkhunaizi and Alhamidi, 2023). In Nigeria a study on experienced pain and coping measures utilised by women during childbirth revealed that sufficient information on labour and coping measures with the addition of concerned midwives impacted on labour experiences positively (Onasoga *et al.*, 2022). The current study did not look at the impact of health care workers on childbirth experiences among the women studied. The educational program was more individualised and the internal resilience was more vital than the external support. Midwives too should be encouraged to support women during childbirth. Other interventions that have proven to boost maternal childbirth experience include, mindfulness based childbirth and parenting and hypnosis based interventions during childbirth (Catsaros and Wendland, 2020; Veringa-Skiba *et al.*, 2022).

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

1. The study sought to determine the effect of the educational intervention program on the intensity of childbirth pain among women, the findings in this study document reduced childbirth pain intensities in the intervention group compared to the control; the null hypothesis is therefore rejected and concludes that the educational intervention was effective in reducing pain intensities among women in the intervention group.
2. The study sought to evaluate the impact of the educational intervention program on women's self-efficacy. The finding shows that the education program improved maternal self-efficacy during childbirth by providing various coping methods in the intervention group, the null hypothesis is therefore rejected and concludes that the educational program enhanced maternal efficacy in the intervention group.
3. The study examined the influence of the education program on maternal and neonatal outcomes, the findings indicate a positive influence on maternal and neonatal outcomes as evidenced by the less maternal complications and high AGPAR scores, the null hypothesis is therefore rejected and conclude that the educational program positively influenced maternal and neonatal outcomes.

4. The study sought to find out what influence the educational intervention had on women's experiences with childbirth. Findings indicate that the program enhanced positive experiences of childbirth by empowering and enabling mothers to go through childbirth with much ease compared to the controls. The study therefore concludes that the program had a positive influence on women's experiences.

6.2 Recommendations

There is need for the ministry of health division of reproductive health to strive and review the antenatal care policy to include childbirth education based on self efficacy theory as a special program should to be intergrated in the 3rd trimester of pregnancy to:

1. Prepare mothers adequately for childbirth by imparting knowledge on childbirth and pain strategies to lower pain intensities during childbirth.
2. Enhance maternal self efficacy by giving information and providing room for practise of various coping skills and cognitive restructuring of pain.
3. Improve maternal and neonatal outcomes by enabling mothers to be calm and less of fear and anxiety during childbirth to allow natural progression of labour to occur.
4. Enhancing positive childbirth experiences among women of reproductive age by giving necessary education that prepares them psychologically for the process of childbirth.

6.3 Further Research

- Further research needs to be done by incorporating birth companions in the training to support mothers during childbirth and their impact evaluated.

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APPENDICES

APPENDIX I: CONSENT FORM

I'm **Mable Khakasa Wanyonyi.**, a post graduate student pursuing Doctor of philosophy in Public Health at Masinde Muliro University of Science and Technology (MMUST). My research topic is ***An educational interventional program in normal childbirth among pregnant women attending health facilities in Kakamega Count, Kenya.***

Reason for study: To determine effect of an efficacy enhancing educational intervention program on women's self-efficacy during labour and ability to cope with childbirth pain at the health facilities in Kakamega County.

Procedure: Pregnant women attending antenatal care services will be recruited and interviewed on the objectives of the study. The study procedure involves responding to a questionnaire administered by an interviewer and will last about 20 minutes.

Benefits and risks: The information you give may help the County to set up childbirth classes to help mothers cope with childbirth pain hence improve the services being given to the mothers in the hospitals during intrapartum care.

Potential risks: there are no risks anticipated in this study. However, the interview will take some of your time.

Confidentiality: the information given in this study will not be shared outside the study setting and will be utilized only for the reason of the study.

Voluntary participation

Being part of this study is at your own will and you may opt out of this study at any time. This has no influence on the care you will receive in the facility.

Follow up schedule: You will be followed up from the time of recruitment to the time of postnatal care.

Further information: for more information, you can contact the researcher through Telephone number; 0720966656 (Mable Wanyonyi) or the MMUST ethics Committee directly

Consent:

Participants consent: I confirm that I have been fully informed about this research and I'm willing to participate.

Signature of participant.....Date..... Signature of investigator.....

APPENDIX II: QUESTIONNAIRE FOR RESPONDENTS

RESPONDENT NO NAME OF THE
HOSPITAL..... DATE OF
INTERVIEW..... NAME OF INTERVIEWER

SECTION A: SOCIO-DEMOGRAPHIC AND OBSTETRIC CHARACTERISTICS.

1. Age.....

2. Marital status (circle) 1.Single 2 .Married 3.Separated 4.Divorced 5.Widow

3. Religion (circle)..... 1.Christian 2.Muslim 3.Hindu 4.others
specify.....

4. Highest Level of education (circle) 1= No education 2=Primary 3=Secondary
4=College 5.Occupation 1= Student 2= Unemployed/housewife 3= Casual 4=
permanently employed
5= self employed.

6. Number of antenatal care visits- 1=none 2=1 3=2 4=3 5=4
6=>4

7. Attendance of a childbirth educational program.1=yes 2=No.

8. What is your parity? 1=1 2=2 3=3 4= 4 5=> 4

9. Was the pregnancy planned? 1=yes 2=No

SECTION B: OBJECTIVE ONE: INTENSITY OF PAIN

a) Visual Analogue Scale

Place an »x« on the line in the location corresponding to the **HIGHEST** strength of pain you felt during childbirth in the three phases of labour. The line is labelled 0-10. Where zero means no pain and 10 means a lot of pain.

b) The McGill Pain Questionnaire

Sections:

(1) What Did Your Pain Feel Like? describe in one word (cutting, burning, tingling, bounding, pearcing)

(2) How Did Your Pain Change with time? from onset till the baby was born

(3) How Strong was Your Pain? Scale of (1-5)

Which word describes it when at its worst?	Mild	1
	Moderate	2
	Painful	3
	Very painful	4
	Excruciating/unbearable	5

State factors that increased or decreased your labour pain during child birth:

Increased labour pain

-
-
-
-

Decreased labour pain

-
-
-
-

Which methods did you adopt to cope with childbirth pain?

SECTION B: OBJECTIVE TWO - SELF EFFICACY

The Childbirth Self-Efficacy Inventory

Short Form of the Chinese Childbirth Self –Efficacy Inventory

Part I - Outcome Expectancy Subscale.

Think about how you imagine labour will be and feel when you are having frequent and strong contractions and when you are pushing your baby out to give birth. For each of the following behaviours, indicate how helpful you feel the behaviour could be in helping you cope with the whole labour process by circling a number between 1, not at all helpful, and 10, very helpful.

#	Statement	Not at all helpful					helpful					Very
		1	2	3	4	5	6	7	8	9	10	
1	Relax my body/Think about relaxing											
2	Get ready for each contraction Stay on top of each contraction											
3	Use breathing during labour contractions											
4	Keep myself in control/ Keep myself calm											
5	Concentrate on an objects in the room to distract myself/ Focus on the person helping me in labour											
6	Concentrate on thinking about the baby /Think positively											
7	Not think about the pain											
8	Tell myself I can do it / Listen to encouragement from the person helping me.											

Part II – Efficacy Expectancy Subscale

Think about how you imagine labour will be and feel when you are having frequent and strong contractions and when you are pushing your baby out to give birth. For each behaviour, indicate how certain you are of your ability to use the behaviour to help you cope with the whole labour process by circling a number between 1, not at all sure, and 10, completely sure.

#	Statement	Not at all sure					Completely sure				
		1	2	3	4	5	6	7	8	9	10
1	Relax my body/Think about relaxing										
2	Get ready for each contraction Stay on top of each contraction										
3	Use breathing during labour contractions										
4	Keep myself in control/ Keep myself calm										
5	Concentrate on an objects in the room to distract myself/ Focus on the person helping me in labour										
6	Concentrate on thinking about the baby /Think positively										
7	Not think about the pain										
8	Tell myself I can do it / Listen to encouragement from the person helping me.										

(b) Verbal Response Scale Mother's Anxiety and Fear of Labour and Childbirth

Tick the box below the response choice that best corresponds to your opinion.

#	Questions/Statements	1	2	3	4	5
1	Labour and birth met my expectation					
3	I was fearful during labour and birth.					
4	I felt anxious during labour and birth.					
5	I was in control during labour and birth					
6	I felt capable during labour and birth					

SECTION B: OBJECTIVE THREE - MATERNAL AND NEONATAL OUTCOMES

1. Maternal outcomes:

- a) **Mode of delivery**
 - 1. Spontaneous vaginal delivery
 - 2. Assisted vaginal delivery
 - 3. Caesarean section
- b) **Length of labour;**
 - 1. Within normal limits
 - 2. Prolonged labour
- c) **Specific complications**
 - 1. Failure to progress
 - 2. Postpartum haemorrhage related to prolonged labour
- d) **Other interventions specify.....**

2. Neonatal outcomes:

- a) **APGAR scores** specify at 1min.... 5min..... 10 min.....
- b) **Birth outcomes**
 - 1. Alive and well
 - 2. Fresh stillbirth
 - 3. Born with asphyxia

OBJECTIVE 4

Women's experience with pain

A) Describe how your experience was with childbirth from the beginning to the end of labour.

APPENDIX III: GUIDE MANUAL FOR CHILDBIRTH CLASSES CHILDBIRTH PREPAREDNESS THE SELF EFFICACY ENHANCING EDUCATIONAL INTERVENTION MANUAL GUIDE

The self-efficacy enhancing educational programme will purpose to increase self-efficacy among pregnant women, with the anticipation that they would successfully achieve behaviours for coping with stress and pain in childbirth. It will comprise of four sessions one hour each interactive educational sessions. Both week days and weekends will be utilized to enable to participate during weekends. Each session will be designed in a group of seven mothers or fewer for enhanced interaction and discussion. According to the evidence on multidimensional efficacy enhancing interventions based on Bandura's self-efficacy theory, the protocol of SEEPP will be an integration of the first three sources of self-efficacy information (performance accomplishments, vicarious experience and verbal persuasion) that will be included in the five main learning activities.

Activity 1: Increasing knowledge and motivating participants)

This will be done through enhancing knowledge and inspiring participants to partake diligently in this process of childbirth preparedness. Mothers attending antenatal care childbirth classes will be taught that birth is a normal, natural, and healthy process and they will be empowered to approach it with confidence. The content of the information will include the bio-psychological phenomena of childbirth (labour pain, causes of labour pain, true signs of labour, stages of labour, procedures to expect during childbirth).

Activity 2: Coping strategies and their demonstrations)

- The approaches for coping with childbirth pain, and their association with self-efficacy for childbirth. Teaching a variety of coping behaviors including deep inhalation and relaxation technique, distraction, cognitive restructuring of pain,

walking, massage and prayer to help participants to control emotional tensions and pain during labour. Providing a demonstration of coping behaviours, including breathing and relaxation, walking around, massage, prayer, role of birth partner, distraction and cognitive restructuring of pain, to help participants control emotional tensions and pain during labour. Expectant mothers will be required to do verbal contrast to practice the learnt coping strategies with use of recall aids at home amidst and following the teaching sessions i.e. photographs and pneumonics

Activity 3: Return demonstration)

Affirmation of the taught coping competencies by the participants through back demonstrations. All participants will be expected to do a back demonstration of the learnt coping strategies.

Activity 4: Vicarious learning

Learning through role models by visualizing in a video. Two expectant women demonstrating coping strategies of pain going through labour successfully.

Activity 5: Mastering of coping competencies

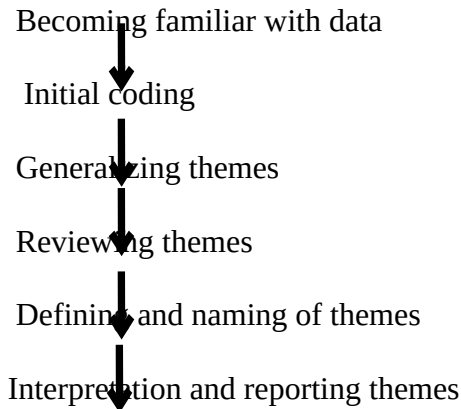
Expectant mothers will be required to do verbal contrast to practise the learnt coping strategies with use of recall aids at home amidst and following the teaching sessions i.e. photograph and pneumonics

Pamphlets' summarizing major coping strategies for directing self- rehearsals and a practical log for everyday recordings as a way of self-evaluation of their positive result after hard work of practice in the belief that competence was achieved through arranged practice the ability to be competent during adverse circumstances.

Activity 6: Verbal persuasion

Convincing the participants through increased motivation and giving the participants a feeling of achievement from the outcome their sustained practice will be enhanced. Group discussion on areas of concern during childbirth, sharing experiences what to anticipate during the process of labour (pain, common procedures: vaginal examination (VE), nutrition, positions). These same mothers will be evaluated at the end of pregnancy on the objectives of the study. The control group will receive usual routine care which does not have arranged childbirth classes. Thereafter comparisons will be made between the two groups with regard to the study objectives to determine the impact of the study.

APPENDIX IV: BRAUN AND CLARKES THEMATIC ANALYSIS METHOD



The above explained;

Familiarizing with data

This involved transcribing the data, reading and rereading and noting down initial codes

Generating initial codes

This involved coding of some common features in the data i.e. coping with pain; data relevant to each code was collected and put under the specific code

Searching for themes

After generating initial codes, the codes were collated into initial potential themes, gathering all data relevant to each initial code

Involved reviewing

Entailed checking of the themes work in relation to the coded extracts to generate a thematic map

Defining and Naming of themes

Analysis to refine the specific for each theme was done and coming up with clear themes

Producing the report- final analysis selecting appropriate extracts-vivid compelling extracts and write up was done.

Discussion of the analysis

APPENDIX V: SAMPLE OF A CODING FRAME

1. Recognition of labour pain

- 1.1 pains in the lower abdomen radiating to the back
- 1.2 Breaking of waters
- 1.3 Thick mucoid blood
- 1.4 Back pain
- 1.5 Heaviness in the lower part of the abdomen
- 1.6 lower back pains
- 1.6 Lower abdominal pains

2. Characteristic of pain and the decision to reach the health facility

- 2.1 On and off
- 2.2 On and off then increasing in severity
- 2.3 pain on and off increasing in frequency
- 2.4 pain was too much could not relax
- 2.5 pain became too much
- 2.6 pain was severe I had to go to the facility
- 2.7 pain was increasing was breathing through the mouth
- 2.8 pain was there I ignored it until it was too much I had to reach the facility
- 2.9 on and off with time it increased

3. Informing significant others and need for company

- 3.1 I told my mother about the pain
- 3.2 I told my husband about the breaking waters
- 3.3. I told my mother –inlaw about my pain
- 3.4. I called the boda boda to take me to the hospital
- 3.5. I called my sister to come and take me to hospital
- 3.6. I informed my friend about what was happening and she came
- 3.7. I told my neighbor since my husband was away
- 3.8 I informed chair of women group that I belong

3.9 .I called my traditional birth attendant to confirm my labour

4. Pain intensities

4.1 CONTROL GROUP

4.1.1 Too much you feel like you are mad

4.1.2 unbearable

4.1.3 Could not bear it anymore

4.1.4 Too much I screamed

4.2 INTERVENTION GROUP

4.2.1 Pain was severe but manageable

4.2.2 Pain was severe but I knew it would end

5. fear and anxiety

5.1 Control group

5.1.1 I felt scared

5.1.2 I was not sure what will happen

5.1.3 I was filled with anxiety

5.2 intervention group

5.2.1 I did not fear because you educated us

5.2.2 I was told what will happen and so was not scared

5.2.3 I knew my baby was well and did not fear the process

6. Maternal and neonatal outcomes

6.1 Control group

6.1.1 Was so exhausted at the end of it all

6.1.2 I bled a lot

6.1.3 My labour was too long

6.1.4 My baby got tired and had to go for caesarean section

6.1.5 My baby could not cry immediately after being born

6.1.6 I felt hopeless when the pain was too much

6.1.7 My baby was not descending well

6.1.8 My cervix was not dilating as it should

6.2 Intervention group

6.2.1 My labour went as I expected

6.2.2 I was happy when my baby cried immediately

6.2.3 I did not take so much time at the facility

6.2.4 My blood loss was minimal compared to the previous delivery

7.coping strategies

7.1 control group

7.1.1 Walking

7.1.2 Scrubbing my back

7.1.3 Screaming and yelling

7.1.4 Removing clothes

7.1.5 Holding the bed tight

7.2 Intervention group

7.2.1 Walking

7.2.2 Breathing techniques

7.2.3 Distraction-phone,

7.2.4 Reading on the wall

7.2.5 Thinking about my baby

7.2.6 Scrubbing my back

7.2.7 Deep inhalation and relaxation techniques

7.2 .8. Thinking positively

7.2.9 Relaxation at the end of the conreaction

7.2.10. Getting ready for each contraction

APPENDIX VI: LETTER FROM DPS



MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

Tel: 056-30870
Fax: 056-30153
E-mail: directordps@mmust.ac.ke
Website: www.mmust.ac.ke

P.O Box 190
Kakamega – 50100
Kenya

Directorate of Postgraduate Studies

Ref: MMU/COR: 509099

15th September 2022

Mable Khakasa Wanyonyi,
HPH/H/01-5719/2017,
P.O. Box 190-50100,
KAKAMEGA.

Dear Ms. Wanyonyi,

RE: APPROVAL OF PROPOSAL

I am pleased to inform you that the Directorate of Postgraduate Studies has considered and approved your Ph.D. Proposal entitled: *"Efficacy Enhancing Educational Intervention Program in Childbirth Pain among Women Attending health Facilities in Kakamega County, Kenya"* and appointed the following as supervisors:

1. Dr. Maximilla Wanzala
2. Dr. Evans Raballah
3. Prof. Mary Kipmerewo

You are required to submit through your supervisor(s) progress reports every three months to the Director Postgraduate Studies. Such reports should be copied to the following: Chairman, School of Public Health, Biomedical Sciences and Technology Graduate Studies Committee and Chairman, Public Health Department. Kindly adhere to research ethics consideration in conducting research

It is the policy and regulations of the University that you observe a deadline of three years from the date of registration to complete your Ph.D. thesis. Do not hesitate to consult this office in case of any problem encountered in the course of your work.

We wish you the best in your research and hope the study will make original contribution to knowledge.

Yours Sincerely,

Prof. Stephen O. Odebero, PhD, FIEEP
DIRECTOR, DIRECTORATE OF POSTGRADUATE STUDIES

APPENDIX VII: LETTER FROM ISERC



MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY
Tel: 056-31375
Fax: 056-30153
E-mail: ierc@mmust.ac.ke
Website: www.mmust.ac.ke
P. O. Box 190,
50100,
Kakamega,
KENYA

Institutional Scientific and Ethics Review Committee (ISERC)

REF: MMU/COR: 403012 Vol 6 (01)

Date: October 13th, 2022

To: Mable Khakasa Wanyonyi.

Dear Madam,

RE: EFFICACY ENHANCING EDUCATIONAL INTERVENTION PROGRAM IN CHILDBIRTH PAIN AMONG WOMEN ATTENDING HEALTH FACILITIES IN KAKAMEGA COUNTY, KENYA.

This is to inform you that the *Masinde Muliro University of Science and Technology Institutional Scientific and Ethics Review Committee (MMUST-ISERC)* has reviewed and approved your above research proposal. Your application approval number is **MMUST/IERC/104/2022**. The approval covers for the period *September 13th, 2022 to September 13th, 2023*.

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 **MMUST-ISERC**.
- 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 **MMUST-ISERC** 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 **MMUST-ISERC** 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 **MMUST-ISERC**.

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

Yours Sincerely,

A handwritten signature in blue ink, appearing to read 'Gordon Nguka'.

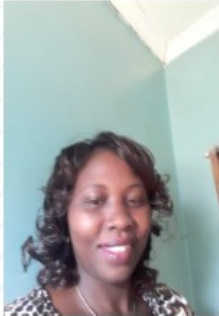
Prof. Gordon Nguka (PhD)

Chairperson, Institutional Scientific and Ethics Review Committee

Copy to:

- The Secretary, National Bio-Ethics Committee
- Vice Chancellor
- DVC (PR&I)

APPENDIX VIII: PERMIT FROM NACOSTI

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: 883574	Date of Issue: 15/November/2022
RESEARCH LICENSE	
	
This is to Certify that Ms., Mable Wanyonyi of Masinde Muliro University of Science and Technology, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Kakamega on the topic: EFFICACY ENHANCING EDUCATIONAL INTERVENTION PROGRAM IN CHILDBIRTH PAIN AMONG WOMEN ATTENDING HEALTH FACILITIES IN KAKAMEGA COUNTY, KENYA for the period ending : 15/November/2023.	
License No: NACOSTI/P/22/21379	
883574	
Applicant Identification Number	Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
	Verification QR Code
	
NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.	
See overleaf for conditions	

APPENDIX IX: LETTER FROM MINISTRY OF HEALTH

COUNTY GOVERNMENT OF KAKAMEGA

E-mail: wpgh15@yahoo.com
Telephone: Kakamega 0702930346
When replying, please quote:
REF: CGH/KAK/ERC/VOL.I/186



COUNTY GENERAL HOSPITAL
P.O. Box 15-G.P.O-50100
KAKAMEGA

DATE: 16th December, 2022

MINISTRY OF HEALTH SERVICES

MABLE KHAKASA WANYONYI.

REF: NACOSTI/P/22/21379

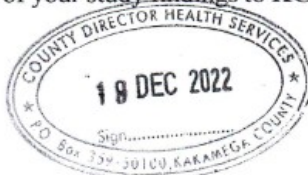
RE: RESEARCH AUTHORIZATION FOR DATA COLLECTION – NO. ERC/179-12/2022

This is to inform you that Kakamega County General Hospital Ethics Review Committee (KCGH ERC) has authorized your research proposal titled: *“Efficacy Enhancing Educational Interventional Program in Childbirth Pain among Women Attending Health Facilities in Kakamega County, Kenya”*. The approval period is 16th November 2022 –15th November, 2023.

This authorization is subject to compliance with the following requirements:

- i. Only approved documents including informed consent, study instruments, will be used.
- ii. All changes including amendments, deviations and violations are submitted for review and approval by the **KCGH ER14C**.
- 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 **KCGH ERC** within 24 hours of notification.
- iv. Any changes, anticipated or otherwise that may increase the risks or affected safety of welfare of the study participants and others or affect the integrity of the research must be reported to **KCGH ERC** within 24 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 **KCGH ERC**.

This authorization should be attached to your research license from National Commission for Science, Technology and Innovation (NACOSTI) and also other necessary clearances. Preliminary dissemination of your study findings to **KCGH ERC** is mandatory prior to publications.



DR. AJEVI AUSTINE
CHAIRMAN; ETHICS AND RESEARCH COMMITTEE
CGH – KAKAMEGA

Copy to: Director, Health Services

APPENDIX X: MAP OF KAKAMEGA COUNTY

