

**Evidence-Based Teenage Health Education: An Approach to Reduce Neonatal Morbidity
and Mortality Among Teenage Mothers, Busia County Referral Hospital, Kenya**

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of Doctor of Philosophy in Nursing Science (Midwifery) in The Faculty of Health Sciences,
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Declaration

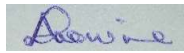
I, Anne Wawire Kabimba, Reg. No. H80/52945/2018, hereby declare that this thesis is my original work and that it has only been presented to the Department of Nursing Sciences, University of Nairobi for academic purposes in preparation for the award of the Degree of Philosophy (Ph.D.) in Nursing (Midwifery). By way of referencing, I have acknowledged all the other researchers whose information has been used in this study.

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Dedication

I dedicate this study to my late sister, Anona, 17years old, who succumbed to maternal death leaving behind a neonate, Mercy, and my late mother who breastfed and cared for the neonate. Today, the then neonate is a mother of one.

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Thesis Organization

This thesis is organized in the following manner:

- Cover Page:** This page depicts the study topic, author and qualifications, student registration number and date.
- Preliminary pages:** On these pages, the focus is on declaration, certificate of approval, dedication, acknowledgement, abbreviations, operational terms and definitions, table of contents, list of tables and figures and the abstract.
- Chapter 1:** This chapter covers introduction to background information of the study, various approaches to antenatal care in preparation for newborn care and the rationale for the ‘Evidence-based Health Education’ approach. It further explains the significance of the study, study justification, purpose of the study and as well outlines the research questions and objectives.
- Chapter 2:** This chapter focuses on accounts of encounters with other researchers by reviewing and referencing various literature, articles and books that were of similar mindset in the reduction of neonatal morbidity and mortality and of importance to this study. The theoretical, conceptual and philosophical backing that informed the research methods and procedures are herein discussed.

- Chapter 3:** This chapter discusses the research methods, materials and processes; the study setting and design, sample size determination and sampling technique, illegibility criteria, study variables, study dissemination plan, validity, reliability and data management.
- Chapter 4:** Here, the chapter focuses on procedures for data analysis (descriptive and statistical), findings and reporting.
- Chapter 5:** This chapter dealt with the discussions, comparing and contrasting the key findings of this study with those of other researchers around the globe, regionally and locally. The chapter also addresses the study conclusion and recommendations.
- List of references:** This section contains all sources of information referenced to and acknowledged as such. APA referencing system was adopted.
- Appendices:** These are support materials, relevant in the development of the research but are saved at the end of the study to reduce the bulk study content.

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List of Abbreviations and Acronyms

BCAW	Burumba County Assembly Ward
BCRH	Busia County Referral Hospital
BDHIS	Busia District Health formation System
CMoH	County Medical Officer of Health
CI	Confidence Interval
CPHO	County Public Health Officer
CHW	Community Health Worker
CHV	Community Health Volunteer
EmONC	Emergency Obstetric and Newborn Care
ENC	Essential Newborn Care
FANC	Focused Antenatal Care
HDI	Human Development Index
IMPAC	Integrated Management of Pregnancy and Childbirth
IUGR	Intrauterine Growth Restriction
ITN	Insecticide Treated Nets

KNBS	Kenya National Bureau of Statistics
KNGNMM	Kenya National Guidelines for Neonatal Morbidity and Mortality
KNH-UON ERC	Kenyatta National Hospital-University of Nairobi Ethics and Research Committee
KDHS	Kenya Demographic and Health Survey
MOH	Medical Officer of Health
NCPD	National Council for Population and Development
NNM	Neonatal Mortality
NVSR	National Vital Statistics Reports
PSA	Population Situation Analysis
RMCAH	Reproductive, Maternal and Child/ Newborn, and Teenage Health
SBA	Skilled Birth Attendant
SIDS	Sudden Infant Death Syndrome
SPSS	Statistical Package for the Social Sciences
TDHS	Tanzania Demographic and Health Survey
UNIGME	United Nations Inter-agency Group for Child Mortality Estimation
USA	United States of America
UDHS	Uganda Demographic and Health Survey
UNICEF	United Nations Children's Fund
UNFPA	United Nations Population Fund
USBA	Unskilled Birth attendant
VLBW	Very Low Birth Weight
W.H. O	World Health Organization

Operational Terms and Definitions

- Neonate:** Neonate in this study referred to a newborn baby aged 42 days and below, born to an teenage mother aged 19 years and below.
- Neonatal Period:** The period, 1-42 days of the newborn, born to teenage mother aged 19 years and below.
- Co-morbidities:** Other conditions or diseases the teenage mother may have had other than those that contributed or predisposed to neonatal morbidity and mortality among the respondents (WHO, 2012)
- Neonatal Morbidity:** State of a neonate being unwell/sick or unhealthy
- Neonatal Mortality:** Neonates born to teenage mothers, dying within the first forty-two (42) days of life following birth.
- Neonatal mortality rate:** The number of neonates born to respondents and died before attaining 42 days of age per 1,000 live births in this period of study (WHO, 2012).
- Teenage Mother:** Any female aged 19 years and below, either expectant or nursing a neonate.
- Socioeconomic Status:** The ability of the teenage mother to financially support herself and her neonate.

Health education: Knowledge imparted by healthcare providers to and gained by the respondents on neonatal care practices in order to reduce neonatal morbidity and mortality

Health service providers: These are health trained personnel, who give services or care for the teenage mothers. Such will include; nurses, midwives, doctors and paramedics.

Community Health Volunteer: a member of a given community who has undergone some instructions to offer basic health education, identify health issues and advice accordingly.

Abstract

Background: Neonatal mortality accounts for about 40% of under-5 morbidity and mortality globally with 99% occurring in resource strained countries. Busia County reported 107 per 1000 live births in the general population. Of these, 58% were neonates born to mothers aged <20 years. The purpose of this study was to try the ‘Evidence-Based Health Education’ approach for reducing neonatal deaths among teenage mothers aged ≤ 19 years. The study objective was to determine if ‘Evidence -Based Education’ would reduce this neonatal morbidity and mortality. Ethical approvals were obtained from Kenyatta National Hospital/University of Nairobi Research and Ethics Committee, National Commission for Science, Technology and Innovation, Busia Directorate of Public Health and Sanitation, Medical Superintendent; Busia County Referral Hospital and informed consents from the respondents.

Methodology: This was an Interventional Randomized Control Trial study carried out at Busia County Referral Hospital in three steps. The target population comprised expectant teenage mothers aged ≤ 19 years, attending antenatal clinic at the hospital. The sample size was 528 respondents calculated using a formula by Pagano. Simple randomization was applied to assign them to two groups; cases $n=264$ and controls $n=264$. The study was conducted in three steps.

Step1: the baseline data was a desk-top review. The data was extracted from records in the newborn unit and files of the teenage mothers from the postnatal ward using a check-list. The descriptive data was collected using semi-structured researcher-administered questionnaire. **Step2** was the implementation of the ‘Evidence-based health education approach’ where only respondents in the intervention group were involved. Themes were identified from the sessions and explored to ensure understanding of the information taught. **Step3** addressed neonatal follow-up and intervention evaluation. I collected all data. The statistical methods included descriptive statistics, logistic and multivariate regression analysis to test the level of significance which was set at $p < 0.05$. The Chi-square tested the relationship between the risk factors and the state of the neonate. Data was analysed using MS excel, Epi Data version 3.1 and STATA. The qualitative data was analysed in themes.

Results: The findings in steps 1 and 2 were presented in figures and tables while findings in step 3 were presented in themes. Most respondents, (94%) were aged 16-19 years, school dropouts- 82.5% and unemployment, 95.6%. The respondents were predominantly Christians, 61% resided in rural areas. Chi-square: there was significant relationship between the state of life and witchcraft ($P \leq 0.001$), neonatal infections ($P \leq 0.000$), prematurity ($P \leq 0.000$) and negligence ($P \leq 0.000$) as causes of neonatal deaths. There was a significant (2-Tailed) value (0.031), hence a statistically significant difference between intervention and control groups on the state of neonates.

Conclusion: Evidence-based health education was effective in reducing neonatal deaths.

Recommendations: There is need to intensify health education for the expectant teenage mothers during antenatal, childbirth, postnatal, neonatal care, breastfeeding and family planning.

Key words: teenage mothers, neonatal morbidity and mortality

CHAPTER 1: INTRODUCTION

This chapter focused on the study background information, extracted from various sources and respondent information on the ground. It further addressed the trends in neonatal mortality in Kenya and broadly, the different approaches to neonatal care practices. The problem statement, study significance, study justification, study benefits, the purpose of the study, Hypothesis, study questions and objectives and finally study implications are discussed herein.

1.1: Background Information

The burden of high neonatal morbidity and mortality (NNMM) has remained a social and economic constrain globally, regionally, nationally and locally to individual mothers, families and the social society (WHO, 2015). Neonatal morbidity and mortality accounts for about 40% of the under-five child mortality, estimated at 2.7 million deaths yearly. This translates into a mortality rate of about 30 per 1000 live births with most dying in the first seven days of life.

Worldwide, the predisposing factors to neonatal morbidity and mortality cut across. They include preterm birth, birth asphyxia, neonatal sepsis, severe congenital defects and extremely low birth weight among others. This reflects the morbidity and mortality pattern in resource strained countries where neonatal morbidity and mortality are high. On the contrary, high-income countries demonstrate low neonatal mortality rates to, as low as less than 1% (WHO,

2015). The World Health Organization estimates that, birth weight below 2500g indirectly contributes to about 15% of the total neonatal morbidity and mortality. Additionally, these rates range from 6% in high- income countries to more than 30% in resource strained countries. While preterm birth remains the main underlying cause of most neonatal mortality worldwide (WHO, 2014), both prematurity and neonatal sepsis account for most deaths in Busia County Referral Hospital (KDHS, 2014).

Throughout the world, strategies to reduce neonatal deaths have been met with shortfalls such as inadequate resources, lack of facilities and equipment, shortage of health care providers (the major challenge), poor infrastructure, low socioeconomic status, , lack of modern technology and socio-cultural beliefs and practices among others. However, interventions have been carried out by donors and Non-Governmental Organizations but their impact on the reduction of neonatal morbidity and mortality has not been felt (KEMRI, 2014). This could be explained by the fact that the donors bring in the aid but do not address the basic education needs, the awareness aspects of the teenage mothers and the gaps in acquiring the necessary knowledge, skills and information with regard to caring for their neonates by themselves as mothers. The funds are mostly directed to strategies applied to the general population of infants and children below 5years of age as opposed to specific groups. Some of these strategies include dispatching posters and pamphlets, mass media airing physical awareness campaigns to which

most teenage mothers do not pay attention or even if they listened, no action was taken, probably due to challenged literacy or audience composition (Ryan et al. 2014).

According to the World Health Organization (2014) statistics, the South and Central Asian countries demonstrated the highest number of neonatal morbidity and mortality at 46% and 56% respectively. However, 18% of these were from the teenage mothers. The Sub-Saharan Africa has the highest general neonatal mortality rate, approximately 34 deaths per 1000 live births as per the 2014 WHO report. Of these, 380 deaths per 1000 live births were from teenage mothers. This accounted for 38% of neonatal mortality rate worldwide. Most of the neonatal morbidity and mortality occur at home where most mothers give birth in unhygienic conditions and in the hands of unskilled care providers (Traditional Birth Attendants) or helped by other mothers. Only 40% of the teenage mothers gave birth in health facilities (WHO, 2013). This has been the case in Busia County, where generally, 85% of the expectant mothers attend the antenatal clinic but only 40-46% deliver in health facilities (BDHS, 2014).

Many studies have shown that neonatal morbidity and mortality are influenced by multiple factors; environmental, maternal peri-natal health, neonatal status at birth, health care systems challenges and cultural beliefs and practices. Socioeconomic, demographic and technological factors have been implicated as indirect determinants of neonatal morbidity and mortality (KDHS, 2014). In Kenya, many approaches have been developed by different stakeholders with the aim of reducing neonatal and infant morbidity and mortality. However, the impact of these

existing approaches has been felt from a distance as indicated by the trends in table 1.1. With this information in mind, the idea of ‘Evidence-Based Teenage Health Education’ strategy was born. ‘Evidence -Based Teenage Health Education’ strategy was developed to help the respondents aged 19 years and below to understand their state during pregnancy, labour, childbirth and postnatal period, exclusive breast-feeding, neonatal care practices and the importance of Family Planning. It was hoped that this would in turn help reduce neonatal morbidity and mortality.

1.1.1: Trends in Neonatal Mortality in Kenya

Table 1.1 Trends in Neonatal Mortality in Kenya

Year	1993/4	1998/9	2003/4	2008/9	2013/14
NND/1000	26	28	33	31	26.3

Table 1.1 compares the trends in general neonatal mortality rates in Kenya for five a year period (KDHS, 2014). This informed the basis on which the neonatal mortality in Busia was based.

1.1.2: Approaches to Antenatal Care

1.1.2.1: Conventional Antenatal Care

According to a study by Ngxongo (2018), the conventional antenatal care approach was developed in the early 1900s based on European models. The approach emphasized the frequency of antenatal visits rather than the quality. It involved schedules of one-to-one visits with a midwife or any other health care provider. It consisted of monthly visits during the first and second trimesters (week 1-28), two weekly visits from 28-36weeks of gestation and lastly

weekly visits until childbirth. Mothers were classified into '**Low and High Risk**'. The classification was based on prediction of possible complications during pregnancy, childbirth and postnatal. Proponents of this approach believed that this was the best way to care for the mother and her unborn baby, hence ensuring a normal and healthy neonate.

However, a report on 'The Saving Mothers' (2018) from South Africa indicated that this approach did not improve the pregnancy outcome, neither did it reduce neonatal morbidity or mortality as maternal and neonatal deaths still went high. Mothers were not given a chance to learn and understand their bodies and how they functioned in support of the recognition of danger signs. Characteristics of this approach included many clinic visits regardless of the risks; the caregiver was the core player, only pregnancy issues were addressed. Care was based on routine indicators of history, weight, height, blood pressure, urine analysis and fundal height. Health education was non-selective and one-way communication with all mothers regardless of age, parity and gestational age. The clients were non-respondent but passive listeners. All decisions pertaining to pregnancy, labour, childbirth, postnatal, neonatal care and breastfeeding were made by the health care provider. The mothers operated on instructions by the care provider. Measures to reduce neonatal morbidity and mortality were basically curative. Effectiveness in reducing neonatal mortality by use of this approach has never been proven by research.

In a systematic review by Downwell, et. al (2015), evidence showed that neonates of mothers who had fewer antenatal clinic visits were at higher risk of being admitted to the Newborn unit. These neonates stayed longer in the ward. The neonatal mortality rate was 14%. The study further had evidence that the mothers felt inadequately attended to since all decisions were made away from them and without their participation.

1.1.2.2: Focused Antenatal Care (FANC)

According to W.H.O (2002), this was a comprehensive health supervision approach of an expectant woman. It was planned examination, observational and guided from conception to onset of labour. It followed a careful systematic assessment and follow-up of the expectant woman to ensure optimal health for mother and fetus. This approach replaced the conventional approach. It was a goal- oriented approach recommended by most researchers in 2001 and adopted by W.H.O in 2002. Since then, it has been accepted globally as an ideal strategy for antenatal care. Provision of care emphasizes holistic individualized assessment and care. The approach divides the expectant mothers in two components; i) **Basic component**; mothers eligible for routine antenatal care and ii) **Specialized component**; mothers eligible for special care as dictated by the woman's needs. Decision making is both by the care provider and the expectant woman. This holistic individualized care is geared towards helping the woman maintain normal progress of her pregnancy through advice, guidance and counseling. Unlike the

conventional approach, FANC is more concerned with the quality of care rather than the quantity. The World Health Organization recommends only four (4) antenatal visits; 1st visit: 1-16weeks, 2nd visit: 17-24 weeks, 3rd visit: 25-32 and 4th visit: 33-36weeks.

FANC has three stages:

Stage 1: Client evaluation (history taking, physical examination and basic investigations)

Stage 2: Intervention (immunization, prevention/prophylaxis and treatment)

Stage3: Promotion (individualized health education, counseling and service dissemination).

The service provider is guided by each woman's individual situation, although they try to make pregnancy care a family affair. Characteristics of this approach include; only four targeted individual antenatal visits as outlined above. It assumes that all pregnancies are a potential risk and does not rely on routine indicators. It is a two-way communication with the expectant woman. The individual woman is followed up by the same care provider through to six weeks post-childbirth. A situation that is not practical given the challenging shortages of health care providers in most health facilities. The effectiveness of this approach in reducing neonatal morbidity and mortality has not been proven to be significant (Hollowell et al, 2014).

1.1.2.3: Emergency Obstetric and Newborn Care (EmONC)

This is a package of medical interventions to treat life-threatening complications during pregnancy, labour childbirth and neonatal period. Emergency newborn care is a package of life

saving measures for the newborns. This approach to antenatal care was adopted by the world leaders at a time when the United Nations Millennium Declaration was being adopted in 2000. The Millennium Development Goals 4&5 on child mortality and maternal health was synonymously agreed upon. It focused on the reduction of maternal and child morbidity and mortality. However, the services emphasize availability, accessibility, quality and utilization of services for the treatment of complications occurring during pregnancy, childbirth and postpartum. Its goals are two-fold; i) to reduce the under- five child mortality by two-thirds and ii) to reduce maternal mortality ratio by three-quarters, between 1990 and 2015 (UNFPA, 2014). This goal has not been realized to date.

This approach of care is skilled service –provider- oriented, hospital centered and curative in nature. The services include; basic neonatal resuscitation, administration of antibiotics, uterotonics, anticonvulsants, manual removal of the placenta or retained products of conception, assisted births among other emergencies. It operates on guidelines issued in 1997 by W.H.O, UN Children’s Fund and UNFPA. The success rate in reducing neonatal mortality has registered very little significance due to the fact that the approach is an exit venture rather than a preventive measure (JIPYEGO, 2016).

1.1.2.4: Integrated Management of Pregnancy and Childbirth (IMPAC)

In 2007, W.H.O came up with guidelines for managing maternal and newborn care; ‘Integrated Management of Pregnancy and Child birth’ (IMPAC). This was a quality policy, technical and managerial approach to maternal and newborn survival and improvement of their health. The approach assumed that all mothers and newborns would have access to skilled care services and thus reduce maternal and newborn morbidity and mortality. The approach focused on preventing, alleviating, treating or managing problems or diseases that would otherwise have adverse effects on pregnancy outcome. The approach was one-way communication, where the care provider gave health education to mothers and their families about pregnancy, childbirth, postpartum neonatal care and exclusive breastfeeding. The woman was a passive listener. The success rate in reducing maternal and neonatal morbidity and mortality by this strategy has not been proven by research.

1.1.2.5: Essential Newborn Care

Essential Newborn Care (ENC) was based on simple principles of proper antenatal care, early identification of mothers at risk and danger signs, basic neonatal resuscitation, avoiding hypothermia, improved neonatal hygiene, early initiation of breastfeeding and timely referral of high-risk neonates for specialized care. Its role in the reduction of neonatal morbidity and mortality has also not been proven.

1.1.2.6: WHO's Dos/DON'Ts in the Reduction of Neonatal Morbidity and Mortality

The W.H.O in 2002, developed a check list of activities to be performed by the health care provider as a strategy to reduce neonatal morbidity and mortality. These activities were:

DO's: These included but not limited to: Essential newborn care, (ANC, childbirth by skilled provider, neonatal resuscitation), avoid infections-treat mother antenatally, avail antibiotics locally, clean birth, cord care, exclusive breastfeeding, keep baby warm; skin –to- skin care, empower families and communities to close gap on postnatal care, Family Planning and financial investments.

DON'T's: The woman was cautioned on the following: cigarette smoking, drinking alcohol, taking hard drugs, giving self- medication and allowing childbirth at home. Despite these warnings, mothers still preferred herbal treatment, over the counter medications and homebirths.

The neonatal morbidity and mortality were not reduced.

1.1.2.7: Group Antenatal Care

Group antenatal care was developed in the United States of America (USA) by a group of obstetricians in a model known as 'Centering Pregnancy'. A midwife provided care to groups of 8 to 12 mothers in the same gestational age. Groups met 8 to 10 times during pregnancy. The sessions included pregnancy assessment and information, education and peer support. Sessions usually took 90 to 120 minutes (Catling et al, 2015). Group antenatal care had several benefits; it allowed the

midwife sufficient time with a group of mothers, giving health education based on the needs of the mothers and not the objectives of the midwife. It was less costly than one-to-one visits. Mothers had more hours of sharing among themselves and with the midwives. It encouraged peer support group throughout pregnancy, the postpartum period and breastfeeding. Mothers learned more in a group setting, with no adverse effects and group-antenatal care was positively viewed by most mothers (Rising, 2016, Grenier et al, 2019). This approach ushers in the now proposed approach in this study at the Busia County Referral Hospital.

1.1.2.8: Rationale for the proposed ‘Evidence – Based Teenage Health Education’

The rationale for using this intervention was because teenage mothers were not equipped with sufficient knowledge antenatally to help them care for their neonates. As a result, childbirths occurred at home assisted by unskilled health care providers in unclean environments and using unsterile equipment. This significantly contributed to neonatal infections and subsequent morbidity and mortality. When I was working with students at the Busia County Referral hospital, I observed that at the antenatal clinic, all mothers who sought services were treated the same regardless of the maternal age and gestational period. For example, the midwife gave the initial health education and counseling sessions to all mothers attending the clinic for the first time as a group. The teenage mothers were usually not attentive. Those who had been attended to would not wait for the session while the rest would quickly leave the clinic as soon as

the care provider finished the session. Others would be seen attending to their phones instead of concentrating. They were most times impatient and shied from being identified as pregnant among older mothers. For those coming for the subsequent visits, they seemed not interested in any further teachings. This was evident when a care provider would attempt individual teaching and yet the teenage mother remained unresponsive as if to say, *'finish what you are doing, I go away'*. The midwife, sometimes directed the health education and counseling to the guardians who were mostly grandmothers.

I witnessed the same scenario at the well-baby clinic where all mothers were again taught and counseled together. The teenage mothers remained passive listeners. It was then that I felt that this situation could be avoided by empowering the teenage mothers through the 'Evidence-Based Teenage Health Education'. This would be considered as a separate and unique group with unique needs, allowing them to share and discuss amongst themselves as peers. The intervention was meant to provide forum for sharing knowledge and new ideas to bring about self- confidence and sense of responsibility in both antenatal and newborn care practices.

This intervention was reported to have worked well in Nepal, Ethiopia, Malawi and Tanzania and therefore could be tried on teenage mothers in Busia County Referral Hospital. It was presumed that this approach of health education would be sufficient, motivate the teenage mothers as well as inform stakeholders in neonatal care and be applied across the board. It is my sincere hope that the intervention cultivates self- reliance, decision making, proper

communication and self- value and therefore reduce the rate of neonatal morbidity and mortality of neonates born to teenage mothers at Busia County Referral Hospital. Additionally, the teenage mothers were likely to benefit more from peer-interactive health education from their view point while I filled in the gaps.

1.1.2.9: Care of the Newborn in Kenya

This section outlines the strategies applied in Kenya to reduce neonatal morbidity and mortality. In Kenya, neonatal mortality accounts for approximately 60% of the under-five mortality rate (WHO, 2014). This informed the need to counteract the contributory factors outlined in section 1.1, paragraph 3. It will be noted that, the basic and simple straightforward interventions applied for reduction of neonatal deaths have had minimal impact owing to the fact that Kenya's middle level health facilities where most of the mothers seek services are ill-equipped in both personnel and equipment (Kenya Nursing Workforce Report- Ministry of Health, 2015). Similarly, the various government programs (child immunization, malaria control and prevention, beyond zero, kangaroo care and exclusive breastfeeding) geared towards reducing neonatal deaths have not had much impact (MoH, 2014).

It is important to appreciate that the immediate care given to the newborn after birth as well as in the late neonatal period is critical in determining the neonate's survival, growth and development and wellbeing in later life. Interventions such as thermal control: - drying and

wrapping the newborn baby soon after birth, skin-to-skin (kangaroo care) for the premature neonates, early initiation and exclusive breastfeeding, cord care and birth immunizations have been put in place. Mothers are generally given information by the health care staff on how to recognize or detect neonatal danger signs and take prompt and appropriate actions (WHO, 2015). Whereas they are good interventions, they have not yielded much, possibly due to lack of follow-up and consistency. Despite all the efforts, Kenya continues to register a slow decline in neonatal morbidity and mortality (KDHS, 2014). Overly, the infant mortality rate seems to have improved a bit between 2008 and 2014 from 52 to 39 deaths per 1000 live births (KDHS, 2014 and KNBS, 2014). Never the less, the neonatal death rate slightly reduced from 31 per 1,000 live births in 2008 and 26.3 per 1,000 live births in 2014

In Busia, there was no official record of neonatal morbidity and mortality specifically for the teenage mothers. However, scattered information as provided by the respondents, revealed that more newborns from the teenage mothers died at home and were never reported due to possible lack of knowledge, awareness, ill preparation of the teenage mothers and lack of social support. Socially and culturally, it is never an issue when a neonate falls ill or passes on. For this reason, it was not sufficiently reported, hence the insufficient data kept by the records department in the hospital and the County. It was my feeling that this study had what it takes to iron out some of these issues.

1.2: Problem Statement

Neonates born to teenage mothers aged 10 to 19 years old worldwide account for 11%. Seventeen million (17m) girls aged 10 to 19 years give birth every year in low- and middle-income countries. The 2014 World Health Statistics indicated that the average global birth rate among 15 to 19 years old was 49 per 1000 for the teenage mothers. Various country fertility rates range from 1 to 299 births per 1000 teenage mothers, with the highest rates being in sub-Saharan Africa (WHO, 2022). According to WHO (2016), 45% of the under-five children, (neonates included) die every year. Three quarters (3/4) of these die in the first week of life, especially in developing countries. World Health Organization further reports that about 50% of all mothers and newborns do not receive skilled service during pregnancy, labour, childbirth, breastfeeding and neonatal care. World Health Organization further indicated that gender inequality, child marriage, poor upbringing, unstable family relationships, limited access to education for both parents and the teenage mothers and ill-birth preparedness and complication readiness played significant roles in neonatal morbidity and mortality (WHO, 2014). According to the UN Inter-agency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA Population Division), 2011-2015, the rate remained high although it slightly reduced from 47 to 45% (5.1 million to 4.9 million) in 2000. However, 2/3 of neonatal morbidity and mortality is essentially preventable. According to the 2008-2009, KDHS findings, western Kenya, neonatal mortality was recorded at 24/1000 live births. The current KDHS, 2014, estimates it at 27/1000

live births, an increase by 3/1000 live births. In Kenya's final Population Situation Analysis Report (PSA), the under 19 years old and married mothers accounted for 15.4% of all the mothers (NCPD, 2013). Similarly, studies have shown that neonatal morbidity and mortality rates are highest among mothers less than 20 years of age at 45/1000 live births compared with 29/1000 for mothers above 20 years (Jalemba et al, 2015).

On July 6th 2022, the ministry of health ranked Kenya 3rd highest worldwide in teenage pregnancies. The PS further reported that one in every five (1/5) teenage mothers aged 15-19 is either already a mother or pregnant. This is calling for immediate action to arrest the situation. The 'Maendeleo ya Wanawake' organization insisted on sex education. However, the 'End the Tripple Threat in Adolescents' national campaign launched in June 2022 is geared towards helping arrest the situation.

Despite strategies to reduce neonatal morbidity and mortality, rates in Busia County have remained relatively high but largely unreported. The Busia County records indicated that neonatal morbidity and mortality remained a major issue in the County's health sector with prematurity and neonatal sepsis being the major contributing factors. A lot has been done to reduce the rates but little has been achieved because of probably lack of knowledge, awareness or participation. Such strategies to reduce neonatal morbidity and mortality included the supply of Insecticide Treated Mosquito Nets (ITN) to expectant and nursing mothers. However, some teenage mothers for lack of proper information put the nets to different uses other than the

intended. This increased the chances of the neonates contracting malaria, a disease so fatal in the neonatal period. Malaria accounted for the increased maternal morbidity that led to premature births, neonatal morbidity and eventually mortality (Kenya Country profile, 2018). The administration of fansidar prophylaxis to prevent malaria to mothers who attended the antenatal clinic was well received, Busia being a malaria-endemic zone. However, this strategy failed to address the teenage mothers who did not seek antenatal services.

The Focused Antenatal Care (FANC) strategy encouraged the mothers to attend antenatal clinics at least four times. However, on the ground, it addressed the issues of mothers' pregnancy, antenatal, labour, childbirth, breastfeeding, neonatal and postnatal health education in general. Despite attending these clinics, most of the teenage mothers gave birth in the homes under the care of traditional birth attendants, grandmothers, aunties and own mothers. The approach to educate the mothers in general has not worked well either, probably because the approach was not all inclusive. The teenage mothers did not consider themselves part of the older group of mothers seeking the care. Furthermore, the teenage mothers tended to hide away from the reality of pregnancy and therefore wanted to be attended to quickly so that they could leave the clinic. For this reason, most teenage mothers defaulted clinics and as such follow-up of ill or deceased neonates was a challenge. The Busia antenatal register, 2011- 2017 had a lot of gaps indicating the defaults. The Busia Child Survival Project of 2006 did not also make any significant difference in neonatal morbidity and mortality rates especially among the teenage

mothers since it was non-specific. There was also very low antenatal services uptake (approximately 30% of the total mothers who attended the clinics) for the teenage mothers probably due to lack of adequate information, fear of intimidation, shame or stigma among other factors (Hospital ANC health records, 2014-2017). The teenage mothers depended on their parents, families, members of a given community, schools, peers, health service providers and social institutions for social learning (WHO, 2016). As a result, they found themselves in a confused state of information.

The Busia County statistics showed that neonatal morbidity and mortality have remained relatively high with about 28% of the neonates being born to mothers aged 20 years and below. The general County Neonatal Mortality rate was 24 per 1000 live births in 2012. Records further indicate that most of the teenage mothers conceived unaware; were either raped or lured into sex by older men in exchange with little cash. For this reason, the responsible males were left to go scot-free. Worse still, the teenage mothers lacked support and consistent supervision and guidance from the community, parents and/or guardians, spouses and health care providers. This was evident from the histories given in the hospital records at the County Referral Hospital. Since most pregnancies were unwanted and unplanned for, the teenage mothers abandoned or left the neonates under the care of their old mothers or grandmothers. Such neonates did not breastfeed but were fed on anything else available; cow's milk, glucose water or porridge (Ndedda et al, 2012). This led to neonatal malnutrition that later led to death. From the records at

the County office of the Registrar of births and deaths (2013-2015), most neonates who died at home were buried without notification to the office. This led to inaccurate records, hence failed strategies. Despite accounting for almost 40% of all under-five child mortality and more than half of infant mortality, neonatal morbidity and mortality have never been a target of the Sustainable Development Goals unlike the infant and child. There is therefore, need to address the issue of neonates as a separate entity.

The trend in Busia County in the general population is no different as the neonatal mortality remains high despite efforts by the County Government and non-Governmental organizations to reduce it. In 2013, the neonatal mortality rate was 31/1000 live births, 2014; 22/1000 live births and currently, 2015; 26/1000 live births respectfully. According to KDHS, (2014), it had been projected that between 26 and 28 neonates per 1000 live births would die by the year 2020 if serious measures were not taken. According to the Busia community, decisions surrounding childbirth and neonatal care are made by older men and mothers. The neonatal care and skills are carried out by grandmothers and aunties as the teenage mothers are considered unskilled (information from some of the guardians). Teenage mothers were never given a chance to express themselves. This led to the question ‘Of what significance is this study?’

1.3: Significance of the study

The study proposed to reduce neonatal morbidity and mortality amongst teenage mothers in Busia County through the ‘Evidence-based Teenage Health Education’ approach. In this way, health education was approached from the respondents’ perspective applying small group teaching as opposed to the usual whole group, health care provider-initiated teaching. I was certain that this approach if well applied would fairly address the needs of the teenage mothers. The teenage mothers would be able to identify their issues and solutions to them by themselves. It is my hope that, since the approach in this study focuses on very practical issues and peer friendly information dissemination, the respondents as well as the hospital and County will embrace it based on what is already known (poor antenatal uptake among teenage mothers, increasing neonatal deaths despite measurers with most of them occurring at home, weak record-keeping system etc) and now, what the study adds: a new approach to antenatal health education (small peer group -teaching and interaction), a new approach to neonatal follow-up at short regular intervals (two weekly), refocusing on neonatal health care practices, case reporting and better record keeping. Additionally, the study findings will serve to improve communication skills and unleash potential for the midwives and Nurses working with teenage mothers, hence better service delivery.

1.4: Study Justification

For a long time, health education in the antenatal clinic has been the responsibility of the health care providers as outlined in section 1.1.2. Mothers of all ages were taught as one unit. They were treated as listeners. The health care providers never gave the teenage mothers a chance to express their views, needs and feelings. Even then, whether these mothers understood and practiced what was taught remains unclear because no evaluation was ever carried out to evaluate the effectiveness of the education approach. The teenage mothers lacked the power to argue for their needs and rights. However, the introduction of the Focused Antenatal Care (FANC) model by WHO in 2001 (goal-oriented) shortly improved the situation but was short-lived due to staff shortages and an increase in underutilization of the services. The model failed to bring significant change in the quality of the ANC services (Mchenga et al, 2019).

It was therefore necessary that this intervention (health education) is implemented so that the expectant teenage mothers and their families are empowered to identify their roles in neonatal care practices, problems and issues, discuss them and find solutions to them by themselves.. This approach encouraged active participation, problem ownership and empowerment in decision-making and problem-solving skills. The teenage mothers became more responsible for their neonates' and their own health following the intervention. In this way, they realized the sense and value in their lives as well as their neonates.

The findings of this study went a long way to add new ideas generated from the respondents and suggested further interventions to the current strategies thus identifying gaps to improve parental and community participation in matters of antenatal care, labour, childbirth and exclusive breastfeeding thus attaching value to neonatal health.

By carrying out this intervention, the study created awareness among all persons who assisted in the birth and care of the neonates. This study is the first to-date to try a new intervention on the reduction of neonatal morbidity and mortality among teenage mothers from the respondents' perspective in Busia County. The intervention moves the mothers from being passive listeners to active players in the prevention of neonatal morbidity and mortality in Busia County Referral Hospital. The findings of the study will help improve documentation and neonatal reporting system and explore significant opportunities for improvement of service delivery to the expectant and nursing teenage mothers.

The respondents were chosen based on the fact that the information at this time is timely and can be fairly retained. The expectant teenage mother at 26 to 34 weeks gestation is naturally starting to feel attached to the fetus and developing a sense of responsibility. The information is more likely to be applied now and in the neonatal period.

Most of the neonatal mortalities occurred at home, therefore never reported. This fact makes it difficult for the County to have accurate records and information of the numbers of neonatal deaths and the mortality rate. However, several studies have been carried out on

neonatal morbidity and mortality in Busia but none has specifically addressed this unique group of neonates.

Some teenage mothers, due to lack of knowledge and skill, were not able to care for the neonates leading to suffocation and cot deaths. Due to poor hygienic conditions and care, neonates contract infections (neonatal sepsis, diarrhoea, dehydration, among others) that eventually lead to increased mortality as explained by some guardians.

According to the County Statistics (2014), there were more neonates born to young mothers who died before the 28th day of life (58%) compared to the general neonatal mortality.

According to the National Conference on Preventive Medicine, Health Education is defined as a process that informs, motivates and helps people to adopt and maintain healthy practices and life styles, advocates environmental changes as needed to facilitate this goal while contacting professional research and training. This no doubt emphasizes the great need for health education as a key intervention in this study. According to WHO (2014), Health Education is concerned with changes in knowledge, feelings and behaviors of the people. It concentrates on developing such health practices as are believed to bring about the best possible state of wellbeing. This Health education aimed at informing the public to increase uptake of health care services. In this study, this has taken the form of interactive teaching and learning

with the respondents so that their full potential is realized. As reported in this document, most neonatal mortality occurs at home where the birth takes place and especially for the respondents who are assisted by their grandmothers and/or relatives. This can be reduced if the individual teenage mothers, their families, significant others and the community members are given correct and accurate information on antenatal care, labour, childbirth, breastfeeding and neonatal care practices. There is need for better understanding of neonatal health problems, the opportunity to actively participate in the care and decision-making concerning care and the reduction of neonatal mortality. This involved improving the quality of services offered to respondents by creating a suitable and conducive environment for them while creating demand and awareness in communities through health education. The intervention aimed at empowering teenagers through evidence-based health education and providing forums for sharing knowledge and new ideas to bring about positive changes in antenatal and newborn care practices. This intervention has worked well in Nepal (Rejina et al 2020), Ethiopia (Girum, 2014), Malawi (No author, 2020) and Tanzania (UNFPA 2020) hence the trial in Busia on respondents and their families. I presume that this approach of health education will be useful, motivate the stakeholders in neonatal health, and enhance proper communication, decision making and documentation.

It is therefore imperative that this strategy be put in place to help the teenage mothers realize their full potential, develop self-reliance and responsibility, identify and understand their

roles and responsibilities in preventing those factors that otherwise predispose to neonatal morbidity and mortality. Health care fraternity in Busia were expected to facilitate the decisions of teenage mothers and promote approaches to problem-solving while focusing on preventing neonatal morbidity and mortality.

Despite the tremendous efforts, Kenya was not able to achieve MDG 4 to reduce infant morbidity and mortality by the expected two thirds between 1990 and 2015. The findings of this study went a long way to add new ideas generated from the respondents and suggested further interventions to the current strategies. This has also boosted the efforts within the collaborative endeavors to reduce neonatal morbidity and mortality in Busia County. The findings of this study are meant to aid in identifying gaps to improve parental and community participation in matters of antenatal care, labour, childbirth and exclusive breastfeeding thus attaching value to neonatal health. The strategy applied in this study serves as empowerment to all stakeholders in Neonatal Health.

The study has provided forums for the respondents to express their views thus increasing knowledge and level of awareness in the postnatal period up to 42 days and the social sphere. By carrying out this intervention, the study created awareness among all persons who assisted in the birth and care of the neonates. Although UNICEF (2014) reported enormous progress in child survival, it also indicated that a lot of focus was required on newborns' survival as a matter of urgency, hence the approach in this study.

This study is the first to-date to try a new intervention on the reduction of neonatal morbidity and mortality among teenage mothers from the respondents' perspective in Busia County. The intervention moves the mothers from being passive listeners to active players in the prevention of neonatal morbidity and mortality in Busia County Referral Hospital. The findings of the study will help improve documentation and neonatal reporting system and explore significant opportunities for improvement of service delivery to the expectant and nursing teenage mothers.

Many of the respondents find themselves expectant unaware and from unknown/known male partners (especially truck drivers, 'Boda boda' (motorcycle riders) and fellow young boys as explained by the teenages themselves). While some expectant respondents hide from their parents and guardians and attempt termination of pregnancy, mostly in the late second and early third trimesters, others progress to term, give birth, only to throw away the neonates either into the rubbish pits or pit latrines (Health records, 2014). Some teenage mothers, due to lack of knowledge and skill, are not able to care for the neonates leading to suffocation and cot deaths (UNICEF, 2012). Due to poor hygienic conditions and care, neonates contract infections (neonatal sepsis, diarrhoea, dehydration, among others) that eventually lead to increased mortality as explained by some guardians. Some young mothers leave their neonates with either their old mothers or grandmothers to take care while they go back to continue searching for

income or resume school (BDHS, 2014). For this reason, the respondents do not breastfeed the neonates, leading to neonatal malnutrition and subsequent deaths.

Culturally, all mothers are encouraged to start a feed a few hours after birth with the notion that the feed would fatten the baby relatively fast (information from one of the old grandmothers). The types of feeds are not specified. So, the neonates are fed on any available food stuff that can be made into liquid form (BDHS, 2014). According to the County Statistics (2014), there were more neonates born to young mothers who died before the 28th day of life (58%) compared to the general neonatal mortality.

According to the National Conference on Preventive Medicine (the USA, 2013), Health Education is defined as a process that informs, motivates and helps people to adopt and maintain healthy practices and life styles, advocates environmental changes as needed to facilitate this goal while contacting professional research and training. This no doubt emphasizes the great need for health education as a key intervention in this study.

According to WHO (2014), Health Education is concerned with changes in knowledge, feelings and behaviors of the people. It concentrates on developing such health practices as are believed to bring about the best possible state of wellbeing. This Health education aimed at informing the public to increase uptake of health care services. In this study, this has taken the form of interactive teaching and learning with the respondents so that their full potential is realized.

As indicated in this document, most neonatal mortality occurs at home where the birth takes place and especially for the respondents who are assisted by their grandmothers and/or relatives. This can be reduced if the individual teenage mothers, their families, significant others and the community members are given correct and accurate information on antenatal care, labour, childbirth, breastfeeding and neonatal care practices. There is need for better understanding of neonatal health problems, the opportunity to actively participate in the care and decision- making concerning care and the reduction of neonatal mortality. This involved improving the quality of services offered to respondents by creating a suitable and conducive environment for them while creating demand and awareness in communities through health education. The intervention aimed at empowering teenagers through evidence-based health education and providing forums for sharing knowledge and new ideas to bring about positive changes in antenatal and newborn care practices. This intervention has worked well in Nepal (Shrestha, et al, 2011), Ethiopia (Girum, 2014), Malawi (Sonia, 2011) and Tanzania (UNICEF (2013) hence the trial in Busia on respondents and their families. It is presumed that this approach of health education will be useful, motivate the stakeholders in neonatal health, and enhance proper communication, decision making and documentation.

1.5: Study Benefits

The beneficiaries of the findings of this study comprise:

- All the stakeholders:
- Empowered respondents in terms of critical thinking and decision making and exercising their potential
- Reduced neonatal morbidity and mortality rates as the awareness on neonatal care practices will have been given to all those who take part in the care of the neonates
- Reduced County referral hospital expenditure on curative treatment for neonates admitted in the Newborn unit.
- Improved neonatal care from both the health fraternity and the social society
- Increased community awareness of the expectations, the value of the neonates hence report all cases about neonatal health and care practices.
- Records department at the Busia County Referral Hospital will receive reports on neonatal health as a separate entity away from infants and children as it is the case currently. This will enable monitoring of the neonates, while drawing demarcation between neonates and infants.

1.6: Purpose of the Study

The purpose of this study was to ‘try’ the proposed ‘Evidence- Based Health Education’ intervention with the view of reducing the rates of neonatal morbidity and mortality amongst neonates born to teenage mothers in Busia County Referral Hospital. The set questions and objectives guided this study.

1.7: Research Questions

1.7.1: Broad Research Question

Will the ‘Evidence-Based Teenage Health Education’ Intervention package given to expectant teenage mothers reduce neonatal morbidity and mortality among the intervention group compared to their counterparts in the control group in Busia County Referral Hospital?

1.7.2: Specific Research Questions

1. What are the risk factors for neonatal morbidity and mortality in the intervention and control groups?
2. How is the social support system for the expectant respondents like?
3. What is the difference in the proportion of completed ANC visits and facility childbirths among respondents in the intervention group compared to the control group?
4. How will the ‘Evidence-Based Teenage Health Education’ package given to the expectant respondents in the intervention group influence reduction in neonatal mortality?

5. What is the difference in neonatal morbidity and mortality among the intervention group compared to the control group?

1.8: OBJECTIVES

1.8.1: Broad Objective

The broad objective was to determine if ‘Evidence - Based Teenage Health Education’ Intervention reduces neonatal morbidity and mortality among neonates born to respondents in the intervention group compared to their counterparts in the control group.

1.8.2: Specific Objectives

The specific objectives of this study were:

1. To identify the risk factors for neonatal morbidity and mortality among neonates born to respondents in the intervention group compared to the control group
2. To describe the social support system for teenage mothers.
3. To determine the difference in the proportion of respondents who complete the ANC visits and hospital births among the intervention group and the control group
4. To find out how the “Evidence-Based Health Education’ strategy influenced reduction in neonatal mortality among respondents in the intervention group.
5. To compare the neonatal morbidity and mortality among the intervention and control groups.

1.8.3: Hypothesis

H₀: The Evidence-based teenage health education approach to antenatal care is not effective in reducing neonatal morbidity and mortality among neonates born to teenage mothers.

H₁: The Evidence-based teenage health education approach to antenatal care is more effective in reducing neonatal morbidity and mortality among neonates born to teenage mothers.

1.8.4: Study Implications

While the respondents would wish the strategy to be adopted and enforced by the hospital, certain things must be put in place way before. Such, would include a review of the County health policies, revision of the budgetary allocation to allow for the hiring of more staff, physical structural adjustments to create rooms to allow for group sessions. The need for an equipped car for home visits and follow up and finally acquire the necessary equipment and resources.

1.9: Theoretical Framework

1.9.1: Introduction

A theory may be defined as a set of concepts that form a systematic view of the phenomenon for purposes of explaining it. Therefore, a theory in research may help link findings between studies. Many theories have been developed in health education to effect change. One could apply one or more theories in a single study to explain human behavior and interpersonal

or group relationships. According to Wagoro (2016), theoretical framework underpins the research process thus forming the philosophical basis on which the research is grounded.

This section described the ‘Health Education Theory’ Developed by Laurence W. Green in 1974 from which this study stems. The theory described herein has been used by many researchers and found to be influential. Such researchers include both individual and institutional researchers. The section aims to help the reader to understand and internalize the knowledge generated in this study and make reference when and where necessary. By virtue of this framework, I was hopeful that the interpretations by different readers would be of importance in the respective set ups. Below are the original theoretical framework as proposed by Laurence W. Green in 1974 and the modified framework tailored to this study (modified by me).

1.9.2: The Proposed Theoretical Framework

This study heavily borrowed from the ‘**PRECEDE-PROCEED**’ Health Education Theory proposed by Laurence W. Green in 1974. The Theory provided a comprehensive structure for assessing health and quality of life needs and designing, implementing, and evaluating health education interventions. It was organized into two parts; i). “**Educational Diagnosis**” - **PRECEDE** (Predisposing, Reinforcing, and Enabling Constructs in Educational Diagnosis and Evaluation) and ii). “**Ecological Diagnosis**” – **PROCEED** (Policy, Regulatory, and Organizational Constructs in Educational and Environmental Development).

Below are the diagrammatic representations of both the original and the modified frame works (figures 1.1 and 2.1)

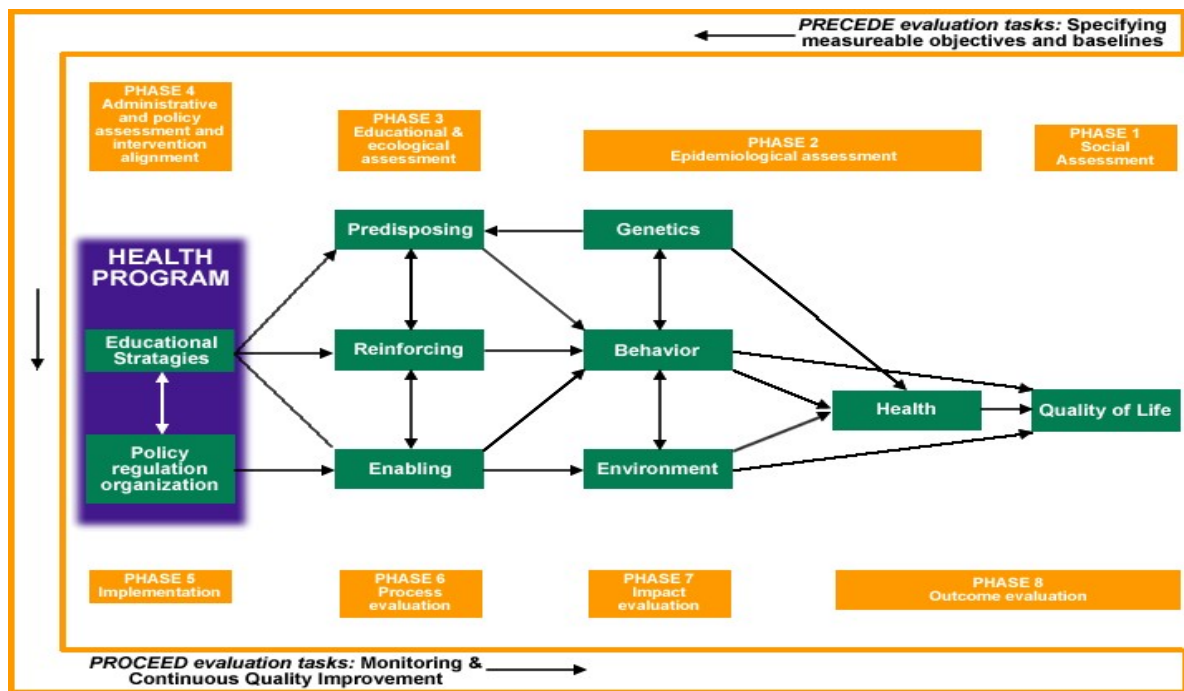


Figure 1.1: Original PRECEDE-PROCEED model (Green and Kreutzer, 1974)

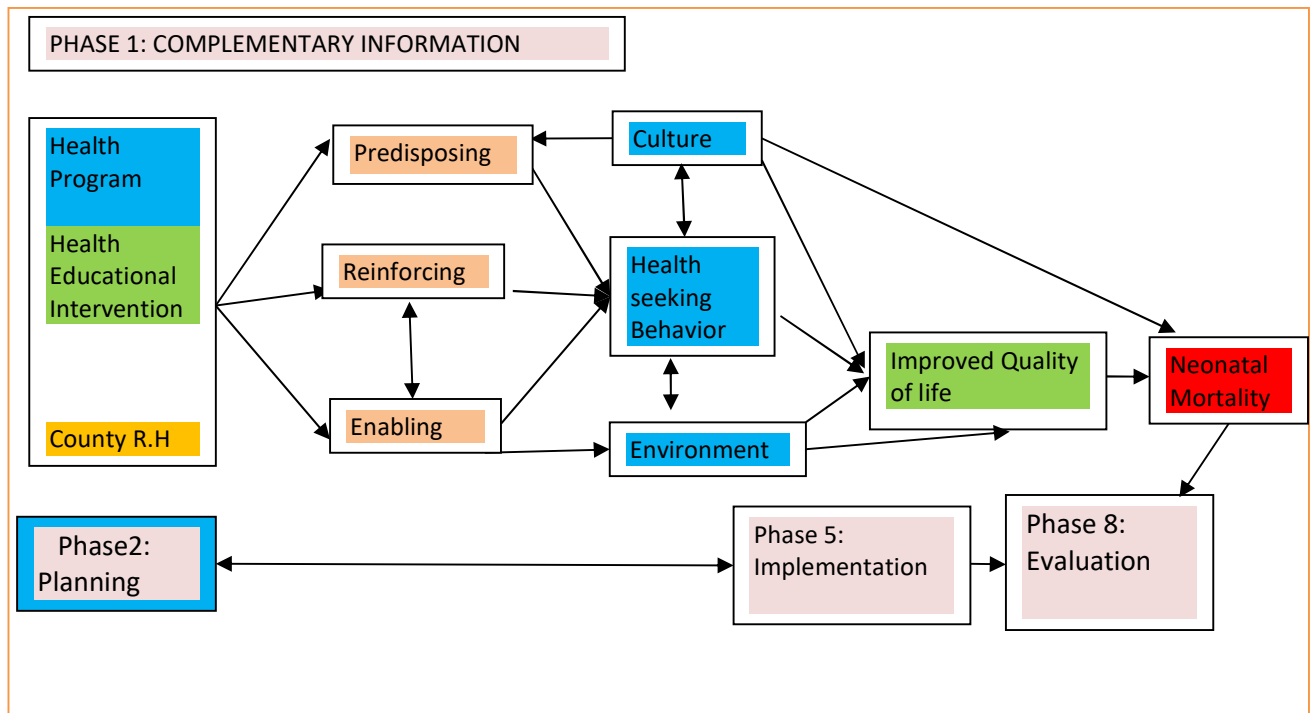


Figure 2.1: A modified version of the 'PRECEDE-PROCEED model to suit this study

The **PRECEDE-PROCEED** model is a participatory model that was initially developed for community health promotion and public health education interventions. The Model is based on the premise that behavior change is voluntary, and that health programs are more effective if they are planned and evaluated with the active participation of implementers and the affected. It focuses on health within the context of the community. However, in this study, I modified it to focus on health education to respondents aged 19 years and below as a strategy to reduce neonatal morbidity and mortality. I found the theory quite applicable in this study considering the fact that the respondents relied on information from their peers that may not have been factual and the elderly who advised them from the cultural perspective. These were behaviours

that could be changed through awareness and health education specifically tailored to the expectant teenage mothers.

The model consists of 8 phases; i) Identifying the ultimate desired result, ii) Identifying and setting priorities among health issues, iii) Identifying the predisposing, enabling, and reinforcing constructs that could affect the behaviors and attitude. iv). Identifying the administrative and policy factors that influence what can be implemented, v). Implementation, vi) Process evaluation, vii) Impact evaluation and viii) Outcome evaluation. This study utilized phases i, ii, iii, v, and viii.

1.9.3: Phase i: The Study Ultimate Desired Result

This study was concerned with the reduction of neonatal morbidity and mortality amongst neonates born to teenage mothers in Busia County Referral Hospital. The neonatal mortality rate at the start of the study was estimated at 58% of the total under -five child mortality. The study therefore hoped to reduce the neonatal mortality rate from 58% to a possible 20-30% or lower by the end of the study intervention; 2018. The study further identified pertinent issues related to neonatal illness and deaths and drew conclusions and recommendations.

1.9.4: Phase ii: Priority Issues of the study in neonatal Health and Health Education

In this study, the priority issues were the identification of factors that contributed to high neonatal morbidity and mortality and the role of the respondents during pregnancy, labour, childbirth, exclusive breastfeeding, newborn and postnatal care. The other priority areas included the neonatal care practices/ skills, health-seeking behaviour, other feeding methods and the socioeconomic factors that adversely affected the life and health of the neonate. The overall goal was to empower and enable the respondents to learn through the group interactive health education sessions during antenatal care.

1.9.5: Phase iii: Identifying factors that contribute to NNMM among teenage mothers.

In this study, the identification of these factors focused on the following constructs; individual and environmental predisposing, enabling and reinforcing factors. In this regard, the respondents were assigned into groups of ten according to their gestational age. I then guided respondents to identify factors in the above constructs from their perspective and understanding. I facilitated the development of solutions to the factors and roles. Several factors were identified and recommendations suggested as indicated in the results.

1.9.6: Phase v: Implementation of the Intervention

This section focused on how the intervention was implemented. The 'Evidence- Based Teenage Health Education' intervention was implemented to the 'cases' through researcher- led

teaching blended with respondents' participation. I selected relevant topics and guided the mothers through the sessions while sharing and deliberating on their experiences and what they knew from the cultural perspective and experience. I facilitated informed decision making and recommendations with regards to the **DO's** and **DON'Ts** as outlined by the WHO. Based on this, a plan of action was drawn; supervisory follow up of the respondents in the interventional group was conducted physically in the homes by the Community Health volunteers, while I followed them during clinic visits and through mobile phone communications. These follow-ups enabled me to evaluate the impact of the newly applied health education intervention.

1.9.7: Phase viii: Evaluation of the Intervention

The purpose for evaluation in this study was to help me realize the intervention outcomes; positive or negative within the cases and compare to the controls. This was both formative and summative. Conclusions and recommendations were then drawn dependent on the outcome as explained in chapter six.

1.9.8: Health Education

In this study, Health Education drew from the biological, environmental, psychological, physical and medical approaches to reduce neonatal morbidity and mortality. It focused on knowledge, life skills building, individual capacity building, behavior change and consciousness-raising techniques of the teenage mothers. I hoped that if the factors in question were modified,

then, there would most likely result in behaviour change, self-confidence and motivation necessary to improve neonatal health. The factors are described below:

- **Predisposing factors** in this study were defined as those characteristics of individuals that motivated or affected behavior and ability in decision-making. Such included knowledge, cultural beliefs, maternal co-morbidities, genetics, place of birth, skilled service provision, values and attitudes among others.
- **Reinforcing factors** were rewards or punishments meant motivate, strengthen or modify the behavior of the teenage mothers. Such reinforcing factors included social support, peer support, self-reliant skills, positive coping mechanisms, economic empowerment among others.
- **Enabling factors** were described in terms of the characteristics of the environment that facilitated action and skill or resource required to reduce neonatal morbidity and mortality. They included programs supporting neonatal health, County neonatal care services, awareness campaigns, **health education**, availability of and accessibility to health services, infrastructure, finances and new skills gained.

1.9.9: Complementary Information

The study analyzed the Referral Hospital records to find out the proportion of the neonatal morbidity and mortality rates. The results facilitated the implementation of health education intervention.

The selection of this theory was based on its fundamental assumption of active participation of its intended audience. Here, the respondents took an active part during the implementation phase in defining their own problems, establishing their goals and developing their solutions. The theory focused on health promotion, prevention and outcomes. It was cost-effective for me and the client. It had also been successfully applied in other studies such as one study on oral health by Catherine and Knowlton (2013). Many research studies have supported the idea of health education. The health education intervention is intended to improve the quality of life for neonates and reduce neonatal morbidity and mortality. The outcome of this study was to help health program planners and policy makers develop health education approaches that are recipient and community-oriented and in support of neonatal health.

1.10: Planning Phase

During this phase, the entire preparations for the program were made. The necessary resources (finance, personnel, space, session plans), teaching aids and equipment were prepared. A two- hour sensitization workshop for the nurse/midwives working in the antenatal clinic, labour ward, postnatal ward and the newborn unit and the community health volunteers was

carried out. This explained the rationale for the new approach to antenatal care to reduce neonatal morbidity and mortality among teenage mothers. Since it was not possible to assemble all at the same time due to staff shortage, sensitization was given in the departments. I emphasized what could be achieved in terms of facilitating ‘Evidence-Based Teenage Health Education’ to teenage mothers. Consenting processes from the authority, including all paper work was done during this phase.

1.11: Implementation

The intervention (Evidence-Based Teenage Health Education) in this study helped to reduce the neonatal morbidity and mortality among neonates born to teenage mothers aged 19 years and below in Busia County Referral Hospital. The intervention helped bridge the gaps that existed between the health service provision and the teenage mothers. The implementation focused on factors that influenced neonatal morbidity and mortality to include, predisposing, reinforcing and enabling factors. Issues of culture, neonatal health-seeking behaviour and environmental factors were also addressed.

1.12: Evaluation

During the evaluation stage, the study focused on both the positive and the negative effects of the intervention to see whether the targeted outcome; reduction in neonatal morbidity and mortality had been achieved and at what percentage or significance. The evaluation helped

to measure the effectiveness of the intervention with regard to drawing substantial conclusions and recommendations

In order to improve newborn health and survival, I depended on the effectiveness of the other projects and what the mothers already knew about them. Many advances in neonatal care though expensive, could be met through health education, simple technologies, interventions and approaches that were affordable and acceptable to the individual teenage mothers and the community. This was my strongest point of reasoning.

Currently, most neonatal mortality occurs in resource strained countries, (Kenya included). Neonatal morbidity and mortality are due to three failures; (1) Failure to identify and address socioeconomic, cultural and logistical barriers to neonatal care and care-seeking behaviour; (2) Failure to implement basic preventive measures (personal and environmental hygiene, health education, regular antenatal care, administration of tetanus toxoid, maternal nutritional counseling and exclusive breast feeding); and (3) Failure to promptly identify and manage the sick and the at-risk neonates. Strategies to reduce neonatal morbidity and mortality were implemented within and integrated into a sustainable health system infrastructure within the Busia County. Since the majority of neonatal mortality occurred at home, there was need to understand the traditional neonatal care practices and care-seeking behaviour.

1.13: Conceptual Framework

The conceptual framework was adopted from an analytical framework for the Study of child survival in developing countries, authored by W. Henry Mosley and Lincoln C. Chenin 1984. This framework was first introduced by Davis & Blake (1956) to design the analytical framework for the study of fertility (p. 138). I then modified it to suit this study based on the available information in the 2013–2014 KDHS and BCRH records. The conceptual framework focused on the proximate determinants of child survivor and incorporated social and biological variables thus integrating research methods herein employed. It enables measurement for a single variable, hence its application in this study that intends to measure neonatal morbidity and mortality and the intervention outcome in BCRH. Correlations between maternal, neonatal and health facility characteristics as applied in this study were used to generate causal inferences about the mortality determinants. For example, social support, income and maternal education were inferred proximate determinants.

1.14: Proximate Determinants Approach

This approach is based on five premises: i). That in an optimal setting, more than 97% of infants survive the first five years of life, ii). That Reduction in survival probability can be realized through integration of social, economic, biological, and environmental factors, iii). Socioeconomic determinants must influence the risk of neonatal outcome, iv). Specific diseases

and nutrient deficiencies observed in surviving children are viewed as biological indicators and v. Growth faltering and ultimately mortality in children results from several factors.

In this study, the key issue was to identify variables that directly or indirectly influenced the risk of morbidity and mortality. Such were maternal factors, neonatal factors and health care provider factors. Below are the diagrammatic representations of the original and the modified frameworks.

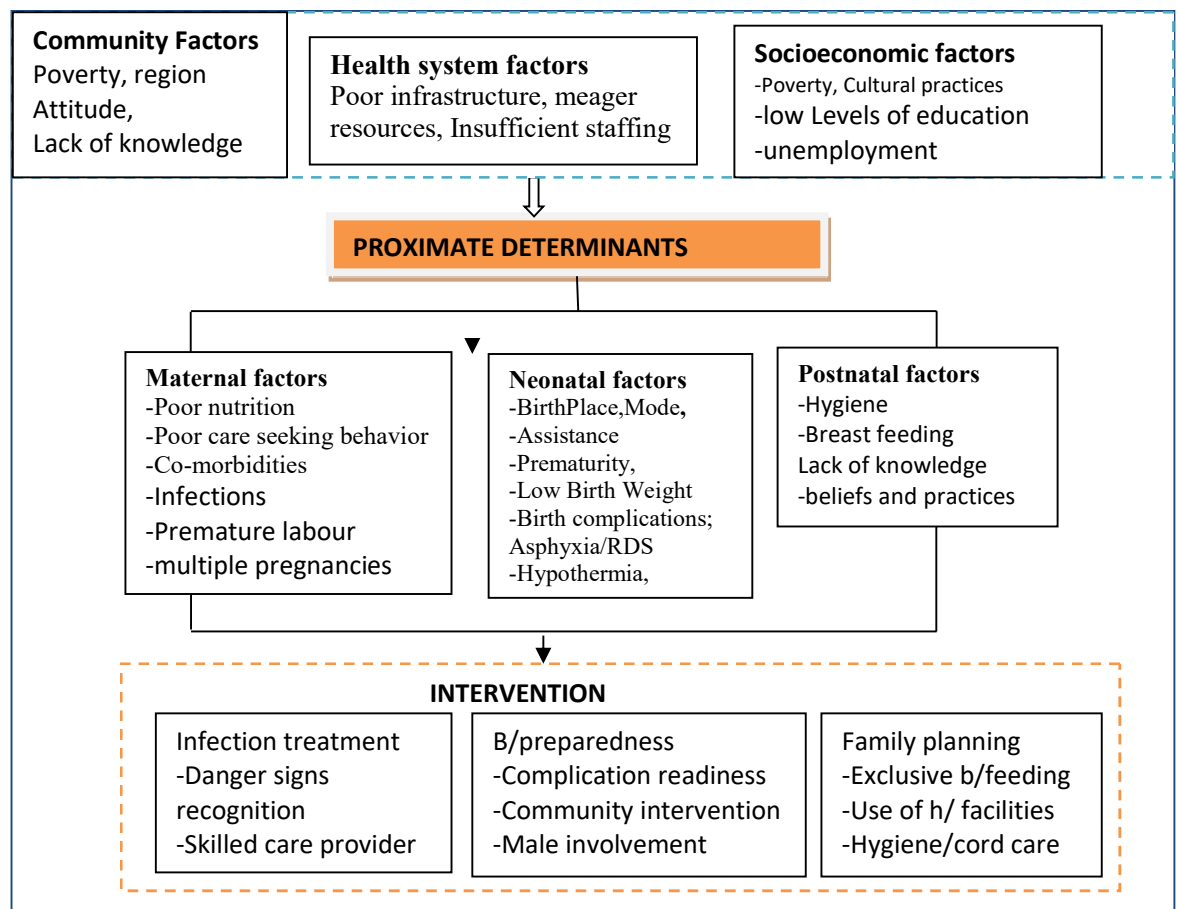


Figure 3:1 Original Conceptual Framework (Mosley and Chen, 1984).

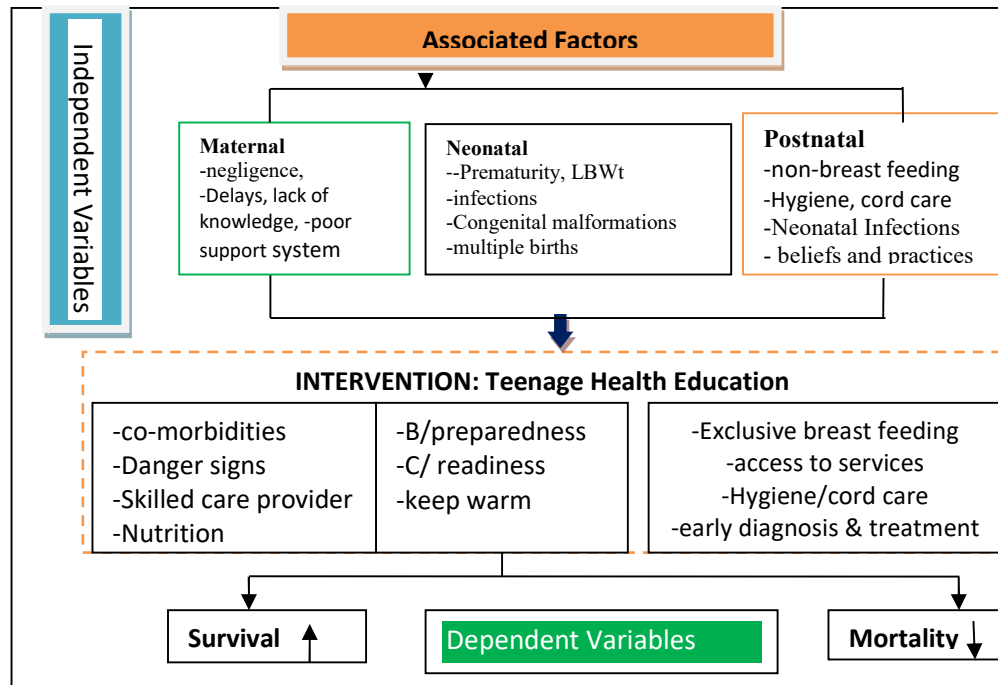


Figure 1:1 Modified conceptual framework (modified by researcher)

The model has been researched and found useful and therefore utilized by various researchers around the world. Such studies include but not limited to researches by Haidong, et al (2014) in their ‘systematic analysis for the global burden of disease’ to measure the neonatal mortality and determine preventive strategies; the Lancet 384(9947), 957-979, Jaime Sepu’lveda, et al (2006) in their study on ‘Improvement of child survival in Mexico: the diagonal approach in which they applied the framework to help develop strategies to prevent neonatal and child mortality based on social and economic factors. Jamil, et al (2018) also applied this framework in their study; ‘maternal empowerment and healthcare access determines stillbirths and early neonatal mortality in Pakistan: analysis and demographic health survey 2012-2013’. Meda, et al

(2018) in their study applied this framework. The approach as applied in this study justified the philosophical world view of I and as such, the study was conceptualized epistemologically, ontologically, analytically, axiologically and methodologically.

Key phrases: Neonatal morbidity and mortality, evidence- based teenage health education, reduced neonatal morbidity and mortality.

1.15: Philosophical Formation

1.15.1: Introduction

The philosophical approach to this study is a strength, in that, it has formed the basis of the methodological processes. Various aspects of philosophy are described herein.

1.15.2: Ontological Paradigm

In this study, ontology was described as the ‘belief’ that reflected I’s standpoint about what constituted the nature of reality (Scotland, 2012, Jackson, 2013). The perspective of ontology applied in this study was ‘critical realist’ (objectivism). This assumed that reality exists independent of the human mind and regardless of whether it is comprehensible or directly experienced. It therefore follows that objectivism (positivism)/realist perspective in which this study was nested, builds on the fact that social entities exist in reality. Social entities refer to the respondents’ environment and the intervention developed herein. This section informed I’s choice of the research design, method of data collection and analysis to identify phenomena, find a solution and make recommendations that would help reduce neonatal morbidity and mortality.

1.15.3: Methodology of a Paradigm

In this study, I defined methodology as the philosophical, systematic framework within which the research was conducted and therefore formed the foundation upon which the research was based. This section describes the approaches and processes used throughout this study. Consequently, each process, procedure or approach has been described in terms of its usefulness and practical applicability to the study (Walliman and Walliman, 2011). I chose to use quantitative research blended with a tinge of qualitative approach. The reason for this mixture was to enable accessibility to as much data as possible given the vulnerable teenage mothers who were the respondents. This was also to avail space for the respondents to freely share ideas during the intervention sessions.

1.15.4: Methodological Principles and assumptions.

The quantitative positivist approach applied in this study is grounded in statistical analysis as described in chapter 4. I am optimistic that with the sample size arrived at in this study; better representativeness and generalizability of findings are assured. I also assumed that the information gathered truly represents the views of the rest of the teenage mothers in Busia.

1.15.5: Methods

The methods used in this study were both quantitative and qualitative approaches. These included; research techniques and tools, randomization, data collection instruments and procedures; structured questionnaires, desktop reviews, checklists and the intervention.

Table 2.1: Qualitative and Quantitative Methods Used in this Study

Study objectives	Methods	Study population, sample size	Time of data collection	Analysis
Risk factors	Sessions, questionnaire	452 teenagers	Feb 2018	Content analysis
Acceptability of evidence-based health education	Sessions Key Informant interviews	Teenage mothers n=264	Feb–Aug2018	Content analysis
Social support system	Questionnaires sessions	Respondents, N=528	Feb–Aug 2018	Descriptive statistics
Uptake of ANC	Questionnaires Clinic records	Respondents n=226	Feb– Aug 2018	Logistic regression analysis

Table 2.1 Summarizes how the qualitative and quantitative methods were used in this study

1.15.6: Axiology of a Paradigm

This section focused on the ethical issues and implementation. It informed me on the behaviour while handling the research procedures, processes and approaches. This was in regard to respect of respondents' rights and minimizing risk to harm (ARC, 2015). Ethical approvals were obtained from Ethics and Research Committee of Kenyatta National Hospital and

University of Nairobi (KNH/UONREC), NACOSTI), Busia County Referral Hospital Administration and the County MOH, Busia County.

The limitations encountered included respondents giving wrong telephone numbers, wrong residential areas and wrong names on their files. Husbands were not willing to consent for their teenage wives or were not there at all. Some guardians were reluctant to consent for the teenagers under 18 years

I employed the four criteria of ethical conduct; **teleology** (doing what is desirable is moral obligation); for this, the respondents were allowed to fully participate in the sessions, being educators of themselves through group discussions and interactions. **Deontology** (whatever is done in research has consequences and benefits). In this study, through the respondents' sharing, many shortfalls were identified such as services that were supposed to be given but not being offered. However, there were positive aspects reported such as health education given by the staff. The **Morality** criterion: (upholding the moral values throughout the study). I kept the respondents' information confidential throughout the study; remaining very truthful to respondents and colleagues by explaining the research contents and objectives to them. **Fairness criterion** (being fair to all respondents); I gave equal chances to all respondents by picking them randomly and treating them on an equal basis as seen in groups selected for the interactive sessions. I embraced Privacy, Accuracy, Property, and Accessibility (PAPA) (Kivunja & Kuyini, 2017).

1.15.7: Research Paradigms

1.15.7.1: Positivism Paradigm of Inquiry

This was first proposed by Auguste Comte (1798 – 1857). Using this paradigm of inquiry in this study, experimentation- intervention, observation and reason were based on my experience and the respondents'. When applied to this study, the epistemology was objectivist, the ontology was realism, the methodology was experimental as this approach had not been applied before, and axiology was beneficence in that the intervention was meant to benefit the respondents). This paradigm is in line with the theoretical framework used as the basis for the study (Green, 1974).

1.15.7.2: Research Philosophy: Positivism

The choice of this philosophy was pegged on the idea that it was ideal for the processes for knowledge creation, data collection, analysis, reporting and consequently findings dissemination. However, the implications of this philosophy in this study were such that through the research, the respondent increasingly gained knowledge that would help them to be more objective in their reasoning and informed decision making. Additionally, I approached this research from the inductive perspective purposing to get answers to the research questions, achieve objectives of the intervention carried out and finally draw conclusions and recommendations.

1.15.7.3: Research Implications

In this research, the choice of a Positivist paradigm meant that the data collected were quantitative and the analysis was carried out using quantitative procedures. This best suited the research design 'Randomized control trial'. However, there was a blend of qualitative analysis. The research questions were answered and the objectives met, then it followed that the respondents were treated with utmost respect and convenience. They were understood and their needs were met independently of the older mothers. The findings informed the policy makers and reproductive health officers in Busia County of the need to develop or restructure the guidelines for neonatal health.

1.15:8 Chapter Summary and Conclusion

From other researchers, it is known that neonatal mortality is on the increase with the highest prevalence being in sub-Saharan Africa, especially in the low- and middle-income countries. Most deaths occur in the homes under the care of unskilled providers and poor environmental sanitation; many strategies and projects to reduce neonatal mortality have been implemented with minimal success. What everyone is struggling with globally is how to develop a strategy that will reduce neonatal mortality. The answer could be 'better ways of giving information to the antenatal mothers while involving the family and the community as a whole'. Devolve health education from clinic-based to family/significant others and community-based. This study purposed to introduce this intervention to fill the gap of insufficient knowledge in the

antenatal clinic and neonatal care among the respondents below 19 years of age that no researcher has addressed. Separating the teenage from the older mothers would give them space and freedom to express their feeling, air their views and make recommendations that could work best in their state. This being a peer group sharing, understanding of the subject becomes much easier. Effects of stigma and anxieties are reduced. If this intervention is adopted, it can play a big role even in the general antenatal mothers' fraternity. This would replace the provider-initiated and the one-to-one health teaching that has not made much difference. It will be easier to teach the mothers since most of the information will be from them. It is easier to implement an idea that originates from the respondent than one from the care provider which is more solid. To do this, a mixed- method of research in bid to accommodate both quantitative and qualitative findings was employed.

CHAPTER 2: LITERATURE REVIEW

2.1: Introduction

This chapter focused on studies by other researchers globally, regionally and locally. The search themes included teenage antenatal care, neonatal care practices, morbidity and mortality, health education strategies for reducing neonatal deaths, risk factors for neonatal morbidity and mortality teenage postnatal and social support system.

The chapter further described the following; literature search strategy, literature review related to identified objectives and variables, the theoretical and conceptual frameworks, the study ultimate desired results, priority issues in neonatal health and health education, factors predisposing to neonatal morbidity and mortality, implementation of the intervention, philosophical formation, research implications and chapter conclusion.

2.2: Literature Search Strategy

To realize the information required for this study, I searched various data sources with scholarly articles for the period 2014 to 2021, dissertations, Ministry of Health guidelines, WHO guidelines, fact sheets and credible stand-alone- work. The data sources included but not limited to peer-reviewed journals in PubMed, MedLine, BioMed, Open Access, Oxford Journals and Research Gate, e-books on neonatology, Neonatal-perinatal medicine, UoN repository and the Cochrane Library that publish articles on maternal and neonatal health. The sources were those that applied education intervention strategies to reduce the neonatal deaths.

The literature review information helped the reader to understand and appreciate the gaps in neonatal care. The literature further unveiled the challenges for effective execution of neonatal health intervention. The choice of the review information directly impacts on the relationship between the respondents and their neonates, families, the communities and health facilities through ‘Evidence –Based Teenage Health Education’ as a strategy for reducing neonatal morbidity and mortality. Additionally, I reviewed literature from across the globe, objective by objective to give the reader a wide range of understanding of the subject matter

Globally, an estimated 10.6 million children under five years (neonates included) fell sick and died in 2000, this declined to 8.8 million in 2008 and further to 7.7 million in 2010. However, the death rate is on the increase again (WHO, 2014). The aim of the United Nations’ Millennium Development Goal 4 (MDG4), now Sustainable Development Goal 3 (SDG 3) was to reduce under-five mortality worldwide to 30 deaths per 1000 live births by the year 2015. However, this was not achieved. The literature review focused on information relevant to the world, Africa, Kenya and Busia County respectfully and their usefulness in the care of the neonates born to the teenage mothers

2.2.1: Literature Review According to Objectives

2.2.2.1: Risk Factors for Neonatal Morbidity and Mortality.

In this specific objective, valuable data were searched as per the subject matter as outlined in section 2.2. From the search, it was found that neonatal morbidity and mortality was attributed to several risk factors. According to KDHS (2014), the factors were either maternal related, neonate related or health care provider-facility related. Almost all articles, studies and reports reported similar or same risk factors.

The WHO experts' meeting (2014) held in Europe to discuss "Reduction of maternal and neonatal morbidity and mortality in countries of Eastern Europe identified neonate related risk factors as prematurity, low birth weight, congenital abnormalities, birth asphyxia, birth trauma, poor feeding habits and neonatal infections. Those factors related to the mothers included; non-breastfeeding, maternal malnutrition and maternal co-morbidities. Factors related to health care provider/facility were poor neonatal resuscitation practices, lack of equipment and resources and expert neonatal health care providers.

According to Abdullah, et al (2016), their study in Indonesia reported six main factors associated with higher risk of neonatal deaths; neonatal complications during birth, neonatal morbidity, maternal lack of knowledge of neonatal danger signs, low Apgar scores, home births and maternal antenatal complications. Birju & James (2014) in their study indicated that neonatal sepsis immensely contributed to neonatal morbidity and mortality, especially among

neonates with extreme low birth weight. According to Hibstu, et al (2014), the major determinants of neonatal morbidity and mortality were lack of knowledge, low level of education, traditional and cultural influence, inaccessible and poor health facilities. . In 2020, in Eritrea, Andegiorgish et al reported sex, sepsis, respiratory distress syndrome, perinatal asphyxia, extreme low birth weight and delays as the major causes of neonatal mortality.

In Africa, neonatal care practices cut across all countries with minimal differences. The neonatal morbidity and mortality are associated with similar risk factors as identified by WHO besides, strong cultural practices, poor maternal health during pregnancy, low socio-economic status and poverty, lack of information, low education levels and stigma were implicated among others. A study in Malawi reported the same risk factors as indicated above and in addition blamed the high incidences of neonatal infections (Bareng et al, 2018). In Nigeria, a study carried out on cultural practices and infant mortality in Cross River State indicated that breastfeeding, low birth weight, poor maternal nutrition status and cultural beliefs and practices were key indicators of infant morbidity and mortality (Undelikwo & Enang, 2018). In Tanzania, a study conducted by Ogbo et al, (2019) and UNICEF indicated that the high neonatal mortality rate was attributed to the same risk factors mentioned above and in addition maternal co-morbidities, lack of knowledge and poor neonatal care practices and health- seeking behaviors were also implicated. Studies in Uganda reported similar risk factors and in addition; poverty, lack of knowledge, high prevalence of malaria, low education standards, cultural beliefs and traditions,

household food insecurity, poor infrastructure, inability/delays to access health care services were cited as key factors.(Kananura et al 2016). Jain et al (2014) in their study in Ethiopia on causes of neonatal death reported neonatal sepsis as the major cause. Ramaiya, et, al (2014) in a systematic review of risk factors for neonatal mortality in teenage mothers in Sub Saharan Africa identified prematurity, low birth weight, poverty low socio-economic status as some of the factors responsible for neonatal deaths.

A recent population study estimated neonatal mortality for Kenya at 277.2 per 1000 live births compared to 12.1per 1000 live births in developed countries (Kassebaum et al, 2013). Two-thirds of all neonatal morbidity and mortality cases occur during the first week of life due to various factors. Such are birth complications and injuries, birth asphyxia, prematurity, severe congenital defects, extremely low birth weight and neonatal infections among others. Furthermore, maternal and socio-economic factors were implicated; poverty, lack of knowledge, malaria, low education standards, community laxity, cultural beliefs and traditions, harsh parents or guardians, household food insecurity, poor infrastructure, inability/delays to access health facilities were cited as key factors that played a major role in neonatal morbidity and mortality (Wangalwa et al, 2015).

According to the Human Development Index (HDI), Kenya was ranked number 145 out of 172 countries in 2012 (HDI, 2013). This meant that, not much progress had been achieved with regard to reducing neonatal morbidity and mortality in Kenya. According to Omedi (2014),

respondents aged 15-18 years with low educational qualifications were more likely to conceive or even get married compared to those with no education at all at a significant $p < 0.00$ value. Teenage mothers with complications were at even higher risk of their neonates dying. According to KDHS (2014), neonates born to mothers aged below 19 years were at higher risk of morbidity and mortality than it happened in older mothers. It is further indicated that 18% of young mothers aged below 19 years already had had childbirth and that this age went as low as 12 years in some counties. Teenage childbearing stands at about 40% nationwide, hence the need to design more strategies to curb it. Muchemi, et.al (2015) reported similar factors as other researchers. According to Jalemba, et al, (2015), teenage mothers learned very little when taught together with the adults as they felt out of place and awkward, low levels of education, inadequate knowledge and poor social support systems have been attributed to increased neonatal morbidity and mortality in Kenya.

According to Jalemba, et al, (2015), teenage mothers learned very little when taught together with the adults as they felt out of place and awkward, low levels of education, inadequate knowledge and poor social support systems have been attributed to increased neonatal morbidity and mortality in Kenya. Akinyi et al, 2014, in their study, reported that mothers who did not attend ANC during pregnancy and those who attended between 1-3 ANC visits had higher odds of losing their infants. Lack of check-ups for pregnancy complications,

unskilled ANC provision and lack of tetanus injection were associated with neonatal mortality in Kenya (Arunda et al 2017)

According to Busia County BCRH records (2017), teenage pregnancies are still high and therefore high teenage births contributing to neonatal morbidity and mortality. Evidence from the Hospital antenatal client record books reported that mothers were well prepared for the journey through pregnancy, labor, childbirth and breastfeeding. The record books showed that the teenage mothers attended the antenatal clinic checkups and health education.

According to hospital reports, (BDHS, 2014), in Busia County Referral Hospital, the risk factors included all of the above, mentioned factors but added others such as mothers abandoning their neonates, neonates being cared for by the teenage's grandparents, some terminating their pregnancies mostly in the late 2nd or 3rd trimesters (leading to premature births and deaths). The other factors were community instigated; communities do not value neonatal health (BDHS, 2014) and as such do not or delay to seek for medical help. First-line treatment of choice for the neonate is tradition oriented. The poor infrastructure, births under the unskilled care provider's care and the poor environmental hygiene were all implicated. According to Jalemba, et al, (2015), low levels of education, inadequate knowledge and poor social support systems have also been attributed to increased neonatal morbidity and mortality. Never the less, factors amongst respondents in Busia were considered as unique entities in their own rights and this included

prematurity, malnutrition, neonatal infections, maternal infections, congenital malformations and low birth weight among others.

2.2.2.2: Social Support System for Teenage Mothers

This objective described the social support systems and activities supported by evidence from various researchers from across the board and from the information gathered from the respondents. In a study carried out in Quang Ninh province, Vietnam (2016), it was noted that the community never valued neonatal morbidity and mortality. This resulted in under-reporting in which the official health statistics revealed the true figures at four times higher. The community did not give neonatal care practices priority. A similar situation was witnessed in most Countries in the world and many counties in Kenya. Similarly, such a situation in Busia was reported requiring attention to create awareness on the effect of the practices to neonatal health outcomes. It was also imperative that the practices are studied further and reasons for failure to report the sick and dead neonates are established.

Målqvist, (2014) in his study reported that most neonates were born and treated traditionally whenever they fell ill at home where most succumbed to the toxicity of the herbs and/or severe infections. The study further reported that a large percentage of the neonates were not immunized due to cultural beliefs and practices while most decisions were made by elders only. A study by Akella and Jordan (2014) in the USA, attributed teenage pregnancies and

births to single parenthood and therefore lack of proper social learning. Similarly, Reyna et al, (2017) in their study on family context, identified poor communication within the families of the teenage as a setback. Yurdakul, M (2018) in his study in Mersin, Turkey, concluded that the teenage mothers had a low perception of social support with the families being the most supportive at a mean score of 23.32 ± 3.23 . Maria Gomes et al 2021 in their study reported that potential difficulties for adolescents in having access to healthcare services in their hometown was a major issue and that there was need for restructuring the maternal and child healthcare network and ensure a social protection network for these girls.

In Africa, there is the presumed period for rest for the mother and the neonate (approx. 40 days). The mother and neonate are then socially allowed out. However, whenever the neonate fell ill, treatment was traditional as first-line then the contemporary care when situations got out of hand. In a study by Etambuyu and Michelo (2015), Kasthuri et al(2018) and Florina et al (2019) carried out in Zambia reported the poor social support system towards reduction in neonatal deaths. A study in Uganda (2014) by Sandberg et al reported lack of knowledge and lack of social support.

In Kenya, according to Jalemba et al (2015), poor social where parents or even guardians disown the pregnant adolescent mothers, inadequate knowledge and low levels of education have been attributed to increased neonatal morbidity and mortality. Lack of respect, coerced sex, sexual violations, child marriage, sexual abuse and neonatal deaths are all treated

with silence in the communities (National Adolescent Sexual and Reproductive Health Policy, 2015). Kumar et al (2018), in their study pointed out that most respondents face many challenges and lack of social and emotional support, social stigma, poor healthcare access, low economic states and as such they are prone to stress-related states where parents or even guardians disown the pregnant teenage mothers, inadequate knowledge and low levels of education have been attributed to increased neonatal morbidity and mortality. Kumar et al (2018) in their study on adolescent pregnancy and challenges in Kenya noted that the respondents faced several challenges; social stigma, lack of emotional support, poor healthcare access and stresses of new life adjustments.

Customarily, in most countries in Africa, a teenager who gets pregnant and gives birth before getting married is perceived as an outcast who has negated the traditions. Therefore, such a teenage was either married off to any or nearest self-offering man or rejected by parents or guardians. Similarly, Reyna et al, (2017) in their study on family context, identified poor communication within the families of the teenage as a setback. The scenario was the same in Busia according to information from the key respondents. Speaking during the world contraception day (2015), at Nangina dispensary, Dr Lutomia, said that Busia was leading in teenage pregnancy at 21% compared to the national prevalence of 18%. She called on authorities to introduce friendly services in health facilities to avoid teenages queuing with the older

mothers in the clinics. She further urged the parents to take responsibility and encourage their girls on the importance of education and re-consider early/or forced marriages.

2.2.2.3: Antenatal Clinic Visits and Hospital Births

The information in this objective focused on the uptake of antenatal care services by the respondents from different researchers. This information was gotten from various sources; articles, guidelines, reports from organizations and Demographic Health Surveys.

The aim of Sustainable Development Goal 4 (SDG 3) was to reduce under-five (neonates included) mortality worldwide to 30 deaths per 1000 live births by 2015, that is, two thirds from 1990 (13. 2 million) to 2015 (targeted 5 million). However, this is yet to be realized down 2020. Globally, an estimated four million neonates and one million neonates in sub-Saharan Africa die yearly. This translates into 333 neonates per 1000 live births and 11,000 neonates dying per day. These figures are quite alarming hence the call for urgent further interventions.

The WHO has set out guidelines on the four possible antenatal clinic visits for the mothers but this has been subject to the normality of the individual pregnancies. However, there are variations in different countries pertaining to the set number of visits. In a study in the Republic of Maldives (2020) in India, more than 90% of all pregnant mothers received antenatal care, yet only half the population receive skilled birth attendance. However, the report

did not single out the teenage mothers yet this is an area of great interest owing to the rising teenage pregnancies and neonatal deaths. Ya et al (2019), in their study on factors affecting the utilization of antenatal care services among mothers in Kham District, Xieng khouang province, reported that 57% of the mothers never received antenatal care due to several factors.

According to WHO, (2015), about 61% childbirths take place in health facilities of which most are in urban areas. The rest occur at home even though the respondents had attended the antenatal clinics. This presented a scenario of a probable negative perception of hospital childbirths that may require further studies. The WHO currently estimates the annual neonatal mortality toll at 4 million globally. Three quarters (3 million neonates) die in the first week of life with the highest risk being on the 1st day of life. It is also estimated that 14000 neonates die every hour worldwide (WHO, 2014). However, this report does not specify the ages of the mothers.

Africa: In a study by Magadi et al, (2015), it was observed that, teenage mothers do not receive adequate antenatal care as do the older mothers. The reasons were attributed to defaulting the clinic visits, lack of knowledge and associated stigma.

In Accra, Ghana, in a study by Anafi (2018), it was found that only 42% of the pregnant mothers ever made it for the first antenatal visit in the first trimester. The study also reported that the adolescent mothers experienced both positive and negative antenatal care. Dowswell et

al (2015) in their study concluded that reduced visits of antenatal care were directly proportional to neonatal morbidity and mortality. According to Eshetu and Selamawit (2016), uptake of antenatal care visits by teenage pregnant mothers (13-19 years old) was extremely low. Several factors were cited. However, these factors were not only under-researched but also poorly understood and as such the services were underutilized. In a study by Jalemba et al (2015), teenage (13–19 years) mothers accounted for 19% of the recorded cases with a case fatality of 84%. According to a 5-year report on the midterm evaluation of the Busia Child Survival Project (BCSP) by AMREF and USAID, Oct. 2005 – Sept. 2010, an increased proportion of mothers who attended antenatal clinic at least four times were at 50% of which 10% were teenage mothers. From reports by KDHS (2014), almost all mothers in the reproductive age (96%) received antenatal care from skilled health care providers. The same case was seen in the Republic of Maldives where more than 90% of all pregnant mothers received antenatal care. However, the number of mothers who gave birth in health facilities was directly proportional to that of mothers who received antenatal care (Maldives National Reproductive Health Strategy 2014-2018). However, the report did not single out the teenage mothers yet this is an area of great interest owing to the rising teenage pregnancies and neonatal deaths. Ya et al (2010), in their study on factors affecting the utilization of antenatal care services among mothers in Kham District, Xieng khouang province, noted that 57% of the mothers never received antenatal care due to several factors.

According to WHO, (2015), about 61% childbirths take place in health facilities of which most are in urban areas. The rest occur at home even though the respondents had attended the antenatal clinics. This presents a scenario of a probable negative perception of hospital childbirths that may require further studies.

Studies in Ethiopia found out that about 75% of neonatal mortality could be avoided using simple, low-cost tools that already existed such as health education, the basic newborn resuscitation, periodic training of the expectant mothers, the community and the skilled health care providers (Girum, 2014). According to Mekonnen, et. al (2013), births to younger mothers aged below 19 years were associated with higher risks of neonatal mortality. The risk of neonatal mortality was 41%, higher compared with births to mothers aged 20 years and above. The strategy was to improve and step up the antenatal services, provide adequate staffing and carry out community awareness in addition to teaching the mothers about neonatal care. Mekonnen et al (2014), yet in another study concluded that Mothers's education is a cornerstone for improved health outcomes, and that education for mothers was essential to improve neonatal survival. The study further reported that while improving mothers's education is a long-term strategy, short-term community-based interventions to educate and counsel mothers and caretakers would go a long way to improve pregnancy outcomes.

Kenya: In a study by Jalemba et al (2015), teenage (13–19 years) mothers accounted for 19% of the recorded cases with a case fatality of 84%. According to a 5-year report on the midterm evaluation of the Busia Child Survival Project (BCSP) by AMREF and USAID, Oct. 2005 – Sept. 2010, an increased proportion of mothers who attended antenatal clinic at least four times were at 50% of which 10% were teenage mothers. From reports by KDHS (2014), almost all mothers in the reproductive age (96%) received antenatal care from skilled health care providers.

2.2.2.4: Evidence-Based Health Education

From the literature, there is a clear indication that interventions are imperative. I explored various interventions as developed and carried out by different stakeholders and researchers and their impact on the reduction in neonatal morbidity and mortality globally, regionally and locally. In this text, I emphasized by highlighting the use of ‘Health Education’ as an important strategy.

According to the WHO (2014) experts’ meeting held in Europe to discuss “Reduction of maternal and neonatal morbidity and mortality in countries of Eastern Europe, good quality primary health care and health education to expectant mothers were key. However, there was need for added efforts to improve antenatal, intra-partum and immediate postpartum care through health education.

Latin America and the Caribbean (LAC) has been reported as one of the regions with the lowest infant mortality, (neonates included), at less than 9/1000 live births. This is attributed to the good health education system strategies used. Such included diligent care of the neonate during and after birth, health promotion and health education to all expectant and nursing mothers, improving basic sanitation system, providing universal access to quality and skilled health care and community involvement (UNICEF, 2011). In a study in Saudi Arabia by Tahani, et al (2013), it was reported that about 34.8% of the expectant mothers did not have sufficient knowledge about antenatal care. The study then concluded that antenatal education was imperative.

Kimberly (2015), in his guidelines, taught and encouraged mothers to exercise, take multivitamin supplements, have enough sleep, gain steady weight, visit their dentists and keep clinic appointments during pregnancy and after birth. The routine pregnancy care, health education was given on history taking, physical examination, blood pressure check weight and height check, antenatal profile, malaria prophylaxis and provision of over and above the Insecticide Treated Mosquito Nets; and counseling. Nutrition and iron supplements are given to check the occurrence of anaemia, fetal growth and development. Some facilities teach mothers exercises to prepare their pelvic muscles for labour and childbirth (WHO, 2015). All these efforts were geared towards safeguarding the health of the unborn baby through.

. In another program by Downey (2014), 'DO's' included mothers being adv to wash hands before handling the baby, keep cord stamp clean, keeping baby warm and comfortable; practice skin-to-skin care, proper baby breast feeding and on demand and burping up the baby to avoid vomiting or regurgitation that could cause choking and eventual death. He emphasized on informing the mothers about immunizations and growth monitoring.

Kimberly (2015), in his guidelines, taught and encouraged mothers to exercise, take multivitamin supplements, have enough sleep, gain steady weight, visit their dentists and keep clinic appointments during pregnancy and after birth. When the baby is born, the mothers were advised to keep warm, breastfeed and do cord care. On the other hand, the mothers were cautioned against alcohol consumption, cigarette smoking, self-medication and strenuous work up. They were further cautioned against methods of waking the baby, smoking near the baby and supplementing the baby's feeds

A study carried out in Bangladesh by Hashima (2012) noted that changing and improving how mothers participate in antenatal care and childbirth through education had a positive impact on the reduction of neonatal mortality. It further emphasized the role of fathers in neonatal care and the need to educate them. Similarly, Abhishek, et al (2014) found out that neonatal deaths could be prevented through consistent antenatal visits, health education, iron supplementation and tetanus toxoid immunizations. In Nepal, local mothers carried out community mobilization and peer health education to reduce neonatal mortality. This greatly improved maternal and neonatal

mortality (Shrestha, et al, 2011). According to Kenner, et al (2009), neonatal morbidity and mortality rates could be reduced through clinical and educational interventions to expectant mothers as well as the healthcare providers. In Nepal, mortality was found to be more in neonates of adolescent mothers due to associated lack of knowledge, (Adhikari et al 2016).

In Africa, neonatal mortality has remained a major concern as most countries have not managed to reduce the mortality as per the MDG 4. Some countries like Malawi have employed strategies throughout the perinatal and breastfeeding periods aimed at checking neonatal morbidity and mortality. Such are the two community-based interventions; awareness and health education to individual and mothers groups and families. In another study in Malawi by Kakaire, et al (2011), it was noted that male involvement in the birth preparedness and complication readiness went a long way to prevent neonatal morbidity and mortality. Similarly, Sonia, et al, (2011) proposed that individual, family and community-based health education interventions would be more effective in reducing neonatal mortality. In Mozambique, a Quality Improvement intervention based on infrastructure, equipment and clinical protocols revealed a slight reduction of neonatal mortality rate but added that more interventions were required, especially health education (Maria, et al, 2016). In Zambia, (author unknown) the study alluded to the fact that neonatal deaths could be prevented by allowing the mothers to explore their own potential during antenatal care. Tanzania has fairly moved though slowly from 46/1000 to 26/1000 live births (UNICEF, 2010). A systemic review conducted by Corine, et al (2015)

revealed that neonatal mortality was still high. The community strategies employed included sustained high coverage of immunization, Vitamin A supplementation, the use of insecticide treated bed nets (ITN) and the treatment of malaria. Making midwifery and newborn services readily available and quality, conducting regular training for health care providers, caring for the mothers and health education to the expectant mothers and the community (UNICEF, 2013 and Mmbaga, et al, 2012) have played a key role in reducing neonatal mortality. In Uganda, according to the report by UDHS, (2010), the newborn mortality is preventable with appropriate knowledge and care practices at individual, family and community levels. With appropriate care-seeking behavior, danger signs are easily and readily recognized. Uganda has also employed approaches; promoting antenatal services as a one-stop-shop for all health services related to maternal and neonatal health, increasing affordability of health services for mothers of reproductive age hence greater accessibility to services, improving linkages and referrals between service delivery points within and between facilities and improved infrastructure for health among others (Global Health Initiative: Uganda, 2011). **In 2008**, The First Lady of Uganda Hon Janet Museveni launched “Uganda’s Roadmap to accelerate the reduction in neonatal morbidity and mortality” and this included health education.

According to Maldonado et al (2020), Chamas (group teaching) in the antenatal care participation by mothers was associated with increased facility based delivery compared to the standard of care in rural western Kenya. In Kenya, interventions have been carried out to reduce

neonatal mortality. Such interventions and strategies focused on Maternal Immunization (T.T) of expectant mothers to enhance maternal immunity against tetanus and the trans-placental transfer of antibodies to the fetus. However, no much teenage health education has been emphasized.

According to Birju and Padbury (2014), administration of prophylactic antibiotics to expectant mothers with premature/ prolonged rupture of membranes has played a major role in reducing the risks of preterm birth and neonatal sepsis. Exclusive breastfeeding and kangaroo care have played a major role in the reduction of the risk of hypothermia, hypoglycemia, acute respiratory infections, diarrhoea, septicemia and therefore neonatal mortality (KDHS, 2014). In 2014, the First Lady of Kenya, Hon Margaret Kenyatta launched the “Strategies to reduce neonatal mortality in Kenya through the **“Beyond Zero”** campaign. In a study by Jalemba et al (2015), the highest risk of neonatal morbidity and mortality is in Sub-Saharan Africa, with Kenya ranked among the top10 countries contributing most mortality. Teenage mothers accounted for 19% of all mothers essentially known to have a higher risk of adverse neonatal outcomes. In a study by Muchemi et al (2015), it was reported that 12.3% prevalence of Low Birth Weight babies carried a substantial risk to neonatal morbidity and mortality in Ol Kalou hospital. The study further suggested the provision of a well-equipped newborn unit to offer essential services to newborns at risk. Therefore, interventions in the antenatal and neonatal periods are of great significance. Poor quality of care due to insufficient staffing throughout the Kenyan health facilities, lack of basic equipment, poor infrastructure, low levels of education,

stigma, poverty and lack of knowledge are the major setbacks to full implementation of interventions (KDHS, 2014). In all these strategies, health education has been missed out, yet it a key component to reducing neonatal morbidity and mortality.

In Kenya still, malaria has remained a major concern as it causes up to 30% of LBW in newborns and account for 3 to 5% of all neonatal morbidity and mortality worldwide (Ebako and Umberto, 2013). The community health volunteers have also been trained to monitor and evaluate neonatal morbidity and mortality in rural areas and refer as necessary. The treated nets are supplied but due to insufficient knowledge, they are put to different uses other than malaria protection.

According to the United Nations Children's Fund (UNICEF, 2014), neonatal morbidity and mortality rate in Kenya was 27/1000 live births. This ranked Kenya among the eight countries that had made slow progress in Africa to achieve MDG 4 (WHO, 2012). However, much has been done to address the Sustainable Development Goals (SDG 3). Whereas, health care providers have emphasized the management, health education and counseling of the mothers in general, they have probably forgotten the needs of the special teenage mothers and the role of parents and guardians in the reduction of neonatal mortality. Kenya has also tried to implement the WHO's strategies although much has not been achieved to date.

Other strategies adopted include offering the four comprehensive visits for Focused Antenatal Care to address quality of care rather than quantity of visits, individualized care,

implementation of evidence-based practices during antenatal care, educating the mothers on birth preparedness and complications readiness, developing birth and emergency plans and finally providing care to mothers and their newborns within 48 hours of birth (Phyllis, 2015).

Some organizations such as ‘The Making It Happen Program’, 2012-2015, put in place mechanisms to reduce newborn morbidity and mortality in Kenya. Busia County was one of the counties targeted due to its high rate of teenage pregnancy. The program focused on improving the quality of Skilled Birth Attendants (SBA) and Emergency Obstetric and Newborn Care (EmONC) through training (KDS, 2014). None of the past or ongoing programs have addressed the challenging needs of expectant and nursing teenage mothers who bear the heavy burden of neonatal morbidity and mortality.

In Busia County, strategies to reduce the neonatal morbidity and mortality include; the supply of Insecticide Treated Mosquito Nets (ITN) to expectant and nursing mothers, the administration of fansidar prophylaxis to prevent malaria, vaccinations, the youth-friendly projects, APHIA Plus and Beyond Zero Campaigns among others (County public health report, 2018).

In conclusion, health education emerges as the most preferred strategy in the promotion of neonatal wellbeing and reduction of neonatal morbidity and mortality.

2.2.2.5: Comparison; Neonatal Mortality, Cases vs Controls

In a study by Godeluck et al (2019) comparing two French cohorts; Neonates admitted to NICU from the Reunion Island and those from the mainland France, it was concluded that ‘adverse neonatal outcomes were more common in Reunionese, a rural setting (32.6%) as compared to mainland France , urban setting (26.6%, $p < 0.001$) across all gestation groups. It was further reported that preterm neonates born in Reunion Island had a higher risk for death compared with those born in the mainland, France. In another study, a comparison between extremely preterm neonates born at 23-24 weeks gestation whose mothers had had health education and those born at 25-26 weeks gestation revealed that the former had higher survival rate with minimal major disabilities compared to the latter. This was attributed to antenatal health education and aggressive neonatal management (Jin et al, 2019).

2.3: Chapter Summary

Considering the literature gathered from different researchers, it is evident that the teenage mothers encounter almost same challenges across the board. However, most researchers applied different health education approaches in trying to combat these challenges. These approaches were generalized to all mothers, leaving out the specific needs of the teenage mothers. The literature clearly demonstrated gaps such as lack of knowledge and practice skills in caring for the neonates, either well, ill or diseased. However, most researchers embraced health education as the most effective tool to enable the expectant and nursing mothers overcome the challenges.

CHAPTER 3: METHODOLOGY

3.1: Introduction

This chapter described the mixed methodology (quantitative- qualitative) adopted in this research. These two methods were applied to capture the feelings and views of the respondents and the key informants. The two methods synergized each other in answering the set research questions and addressing research objectives. The chapter also addressed such information as study design, study area description, study population, target population, the definition of controls, eligibility criteria, sampling procedures, sample size determination and formula, recruitment of respondents, study variables, study procedures, data abstraction, data collection procedures and instruments and intervention procedures.

3.2: Study Design and Rationale

Randomized Controlled Trial (RCT) design was used. Randomization in this study was defined as the technique suitable for selecting expectant teenage mothers herein referred to as 'respondents' and assigning them to two groups; an intervention group (Cases) and a Control group (Controls). A pragmatic approach in which the intervention activities were integrated within the routine antenatal services was applied. The key respondents were purposively selected from the health care leadership by virtue of their leadership and management roles and skills. Client files from the records department and the registers at the clinic, postnatal ward and the Newborn unit were used to extract the baseline data to back up the information on neonatal

mortality as was required. Additionally, the technique was economic-friendly, simple, easy to apply and could be fairly well understood by the respondents. It was also moderately time-consuming.

3.3: Study Area Description

The study was carried out at the Busia County Referral Hospital (BCRH). This is a level IV hospital as per the Kenyan health care system classification. The hospital is situated in Busia County, Matayos Constituency, Burumba County Assembly Ward and Mjini sub-location. It is the largest and the main referral hospital for the seven constituencies, namely; Budalangi, Matayos, Nambale, Funyula, Teso North, Teso South and Butula and the neighbouring Busia County of the Republic of Uganda. Matayos constituency has a population of 68,567 males and 74,027 females. The hospital serves a total of eighty-one (81) health facilities spread throughout the County with every ward having 1 or 2 community health volunteers (CHVs) attached to them for community mobilization. The Hospital's total catchment area is 1,695km² with a population of 961,068 persons (Estimated. census, 2014). Females number 496, 981 (52.7%) and the males, 456,356 (47.3%), of these 246,234(25.6%) are aged 10-19, and children under the age of ten years total to 144,616 (15.0%), (Census, 2014) respectively. Population density is 456.86 persons per Km².The young, less than 19 years and married were approximately 649 (0.1%), (BDHS, 2014). The prevalence of neonatal mortality was 58% for the teenage mothers for the past three years as per the demographic survey reports compared to the general population at 33%. The

Busia County fertility rate is 6% vs 4.6% (Kenya national average). Family planning uptake in the general population is at 46.5%. The high fertility rate and the low family planning uptake may explain the high neonatal mortality rate.

The poverty rate is at 66.0% (UNICEF, WHO, The World Bank, UN Pop Div. Levels and Trends in Child Mortality Reports, 2014). The levels of education at the time of the study were as follows; primary level; more than 50% of the school-going age attained primary education, total enrollment in secondary schools was about 20% of the age cohort while the tertiary and University institutions were yet to establish fully. The overall literacy level was 4.7% below the national target of 78.73% (74.03%) (Busia CIDP, 2013-2017). This scenario was a manifestation of the high rate of school drop-outs, especially for the vulnerable expectant and nursing teenage mothers.

The unemployment rate was 70%; formal employment- 1%, while the informal employment was 29%. This explained the high poverty rate indicated above. The County has poor access to health facilities with only 10.3% of the population living within less than 1km from the nearest facility, 19% lived within a radius of 2-4.9km and the remaining 70.7% lived >5km away from the nearest health facilities. (Busia CIDP, 2013-2017).

The main staple food was maize meal (ugali) with traditional green vegetables and fish (popularly known as ching'eni). However, other foods are grown but on small scale. Such foods include beans, cassava, finger millet, sweet potatoes and fruits. The main economic activities in

the County are small scale farming, small scale business (especially in the Central Business District), fishing, animal and poultry rearing. The state of environmental sanitation was fair as most of the home states and compounds were fairly clean. The housing was mostly iron roofed with earthen walls and floors. The sources of water were mainly protected springs. The terrain; moderate rainfall twice a year. It is hilly towards the north. The climate is classified as tropical with average temperatures of 22 degrees Celcius and annual rainfall of 1691mm. Most of the roads are rough and earthen with few dressed with marrum. Busia is traversed by several seasonal rivers. The population is predominantly of the Luhya and Teso tribes and mostly Christians. Cultural practices still being practised include; male circumcision, marriage rites, child naming and funeral and burial rituals.

3.4: Study Population

This was described as the general population of the expectant mothers seeking antenatal services at the Busia County Referral Hospital antenatal clinic.

3.4.1: Target population

The target population comprised of the expectant teenage mothers aged 19 years and below seeking antenatal services at BCRH antenatal clinic.. The expectant teenage mothers attending the antenatal clinic at the Busia County Referral Hospital were randomized into two groups: the ‘Intervention group’ and the ‘Control’ group herein referred to as ‘Cases’ and

‘Controls’ During selection, none of the respondents declined the participation as they freely and willingly consented.

3.4.2: Definition of Case and Controls

Cases: In this study, ‘Cases’ referred to the group of expectant teenage mothers aged 19 years and below to which the intervention was instituted. This group was subjected to the intervention of ‘Evidence-Based Health Education’ and monitored throughout the entire study to note the outcome. The study was used as a measure/outcome of the impact of the intervention, in this case, the ‘**Reduced Neonatal Morbidity and Mortality**’.

Controls: In this study, the ‘Controls’ referred to the group of expectant teenage mothers aged 19 years and below that was used to compare the change in neonatal morbidity and mortality herein referred to as the ‘control group’. These mothers underwent the normal usual routine antenatal care at the BCRH antenatal during the entire study period. They were equally monitored throughout the study period. The members of this Control Group were drawn from among the expectant teenage mothers attending the antenatal clinic at the Busia County Referral Hospital during randomization. The same characteristics as in the intervention group were applied for purposes of equalizing and to enable me to compare the results to note the change. The same data collection tools as in the intervention group were used except that this group was single-blinded and that no intervention was carried out.

3.5: EligibilityCriteria

3.5.1: Inclusion criteria

For a respondent to be included in this study, she must have been 19 years old and below. She must be expectant and a resident of Busia County. The order and number of pregnancies did not count. Respondents at a gestation of 26-34 weeks were selected to allow sufficient time for the intervention, monitoring, follow up and evaluation. The respondent was expected to provide a reliable phone number or any other reliable contact to facilitate communication and follow up. The respondent herself or her parent or guardian should have been familiar with the area community Health Volunteer (CHV). The Key Informants were Midwives in-charge of the antenatal clinic, labour ward, postnatal ward, Newborn unit, MCH clinic and the in-charge of records (or any other staff as assigned by the in-charge). All these were to facilitate easy information gathering, monitoring and follow up of the respondents

3.5.2: Exclusion Criteria

In this section, the teenage mothers with chronic co-morbidities on regular medication were excluded since the maternal diseases were already obvious and unavoidable neonatal risks. Teenage mothers who were students and/or residents of Busia but non-Kenyans were also excluded for risk of loss to follow up. Mothers who, on examination were found to have complications that required interventions were also excluded.

Any key informant related to any of the respondents in both groups at the time of study was also excluded as this would create information bias and information spillover.

3.6: Sampling Procedure

The sampling technique was probability sampling method; simple randomization. This technique was chosen because it was based on single sequence of random assignment and provided equal chances for members to be selected to either group. It was effective, guaranteed the representative sample of the population and less costly.

3.6.1: Randomization Procedure

This procedure did not follow a predetermined sequence or pattern but instead provided equal opportunity for every expectant teenage mother to be sampled and assigned to either group. The procedure begun at the registration desk with history taking from every expectant mother. The information gathered and recorded in the antenatal record book included age, marital status, religion, occupation, level of education, parity and place of residence. Medical and surgical history was taken to rule out maternal pre-existing medical co-morbidities (hypertension, diabetes mellitus, cardiac conditions, infectious diseases, asthma, tuberculosis, HIV/AIDS etc.) and any surgical interventions that would otherwise jeopardize the outcome of the pregnancy. Obstetric history included the dates of the last normal menstrual period to help calculate the gestation age as well as the 'Expected Date of Delivery' (EDD-add 7 to the date of the first day of the Last Normal Menstrual Period (LNMP) and either subtract 3 or add 9 to the

month), history of twins in the two families, any previous miscarriages or still births and parity. The respondents were registered as it was usually done in the clinic in the antenatal register. The respondents then proceeded for the usual antenatal checkup process. The physical examination involved 'head-to-toe examination; physical appearance, state of hygiene, signs of infection, state of breasts, abdominal palpation to ascertain the lie and presentation of the fetus thus ruling out mal-presentation and malposition (any of these two conditions puts the mother at risk of surgical intervention), the life status of the fetus was ascertained by fetal kicks and auscultation. The mothers due for Tetanus Toxoid vaccination were immunized and the iron supplements and malarial prophylaxis were administered. They were then given the mosquito nets and advised on the use. The antenatal profile for each mother was carried out; Haemoglobin level, routine urinalysis, serology, syphilis test).

After the clinic processes, the under 19year old mothers proceeded to the recruitment desk. Here they were assessed for eligibility to participate in the study as outlined in section 3.5.1, hence the process of randomization. Two small envelopes containing a small unlabeled pink card in one and a white one in another were displayed for the mothers to pick one. Two mothers were given a chance to pick one envelope each at a time. The mothers were not shown the colour of the card they picked. The colors were meant to conceal the group allocation to reduce selection bias and therefore check on influence by the staff. Pink cards represented 'Intervention' and white cards represented 'Control'. A sticker of the corresponding color was

stuck on the respective mother's antenatal record book. The mothers were then assigned the groups accordingly. In this technique, every expectant teenage mother meeting the inclusion criteria described above was selected with replacement until the sample size of 264 respondents was attained for each group (a total of 528 teenage mothers). The mothers and the midwives were both blinded.

3.6.2: Sample size determination and formula

To measure the proportions of neonatal deaths in Busia County Referral Hospital (in both the intervention and the control groups), the study employed the sample size estimation formula by Pagano & Gauvrea, 2000 as shown below:

N=Size per group

P= the response

$N = 2 (z_1$

$\frac{Np = (Z\alpha/2 + Z\beta) sd)^2}{\bar{p}}$

\bar{p}

n_1 = sample size for each group, nP = number of pairs

Z_α = value of error; $\alpha. = 1.96$ (5%)

Z_β = value of error $\beta. = 0.84$ (20%)

d = minimum difference between the mean values

sd = standard deviation of the difference between pairs

\bar{p} = The proportion of neonatal deaths among the respondents (58%).

Substituted

$n = \frac{(1.96/2 + 0.84) \times 15)^2}{0.58}$

0.58

= 528/2 = 264

Intervention group = 264

Control group = 264

The denominator was the number of neonates born to the teenage mothers and died before 28 days of life and the numerator was neonates born to teenage mothers during the study period.

3.6.3: Recruitment of Respondents (Sampling technique)

The process was carried out on Mondays and Wednesdays for 36 days (an average of 15-16 mothers per day for both groups) to enable I to attain the required sample size of 528 mothers. The mothers with pink labels formed the intervention (evidence-based teenage health education) group and those with white labels formed the control group (usual care). The intervention sessions ran on the same days as their clinic appointments to avoid disruption of the services or cause inconvenience. On Tuesdays and Thursdays, there was no recruitment but the usual clinic services continued. The mothers with white labels were booked for their clinic visits on these days to avoid crossovers. The mothers in the control group followed the same procedure of selection except that they did not get the intervention but continued the usual one-to-one health education as required by WHO guidelines for focused antenatal care. The topics were the same for both groups. The difference was that in the intervention group, the teaching was pre-planned and two-way (client-led and the facilitator-guided). In the control group, the teaching was provider-led and instructional and the solutions were mostly advisory or dictated as in 'Dos and DON'Ts'. The study equalized the samples selected in terms of gestational age sets (26-30 and

31-34weeks) to avoid bias and facilitate easy learning and understanding. All the key informants were purposively selected.

3.6.4: Consenting Procedures

I developed four consent forms, of which two had local language translated versions. The consent forms were as follows: I). Information consent form (Appendix 4a): The details of the study were explained; purpose, objectives of the study, benefits of the study, nature of the risks involved, rights of the respondents, confidentiality and the contacts of the persons to be contacted in case of need. This was also translated into the local Luhya language (Appendix 4b). ii). Respondents consent form (**Appendix 5a**): in this form, I introduced self and explained to the respondents and guardians/parents who had accompanied the mothers, reasons for carrying out the research and the importance of their participation. It aimed at winning the respondent's acceptance, willingness and cooperation to participate in the study. The form was signed by the respondent and a witness. This form was also translated into the Luhya language version (**Appendix 5b**) for easy understanding. iii). Statement Consent form (Appendix 6): in this form, the respondent demonstrated understanding, acceptance and voluntary willingness to participate in the study and also sought clarifications as necessary. The respondent signed the consent. iv). Key informant Consent form (**Appendix 7**): this was specific to staff as their questions were short and tailored towards giving service and also complement the information from the

respondents. The consent consisted of the purpose of the study, the rights of informant and the benefits of the study to both sides and confidentiality. I and the informant both signed the consent.

Some respondents or guardians or parents preferred verbal consents and same was respected. In addition, I wrote letters seeking authority from the County's Ministry of Health, from the County Director of public health and Sanitation services and the Hospital Medical officer of Health of Busia County Referral Hospital (Appendix 8).

The consent forms were administered after the usual antenatal routine visit assessment and respondent sampling. The consents were signed by the concerned respondents, guardians, and parents in my presence and a witness. The witness was the nurse attending to the teenage mother in the antenatal clinic or the CHV. For the respondents not able to read and write, one of the nurses who understood the local language was requested to read out to the respondents the translated version of the consent (Appendix 4b and 5b) and explained in the local Luhya language for easier understanding. The respondents were then requested to append their fingerprint in the presence of the witness who also signed if able or appended the thumb print. All respondents signed the consents willingly after explanation without being pushed or convinced.

3.7: Study Variables

The variables in this study were guided by the Mosley and Chen conceptual framework (1984) previously used in similar studies. Furthermore, the framework was subsequently modified in line with the philosophies and objectives applied to suit this study (figure 4.1).

3.7.1: Dependent Variables

In this study, the main dependent variable was the reduced neonatal morbidity and mortality and improved neonatal survival amongst the neonates born to teenage mothers.

3.7.2: Independent Variables

The main independent variable was ‘Evidence-based Teenage Health Education’ that addressed the following:

- **Antenatal maternal variables:** physical, psychological and physiological changes, minor ailments of pregnancy, signs of onset of labour and child birth, danger signs, birth preparedness and complication readiness, ANC visits

Objective: to explain the variables

- **Neonatal variables:** the premature neonate, low Birth Weight, congenital malformations, neonatal birth complications/injuries, neonatal infections, immunizations.

Objective: to identify the variables

- **Postnatal variables;** care of the neonate, recognition of neonatal danger signs, exclusive breastfeeding, neonatal Care seeking behaviours, neonatal hygiene and cord care

Objective: to gain skills

These interventions influenced neonatal morbidity and mortality through group interactive health education lessons with the expectant teenage mothers. The lessons taught were; the importance of attending ANC and health facility births, role of good nutrition, knowledge on co-morbidities, recognition and reporting of danger signs, birth preparedness and complication readiness, seeking access to skilled care provider services, immediate neonatal care, keeping the neonate warm, exclusive breast feeding, good neonatal hygiene and cord care, early diagnosis & treatment of neonatal infections and uptake of immunizations, postnatal and family planning services, family and social support systems and the mothers s' coping strategies.

3.8: Study Procedures

In this section, the data collection tools and how data collection was carried out were described. Data was collected in three parts: 1). Baseline data 2). Intervention 3). Follow-up and evaluation. The baseline data was obtained from the hospital records, desk-top review of antenatal clinic registers, postnatal files of respondents and files of the neonates admitted to NBU. The data was also collected from the expectant teenage mothers' antenatal record books and verbally from both groups using a semi-structured researcher-administered questionnaire.

The intervention data was qualitative in nature. It was obtained from the respondents in the intervention group alone during the health education interactive lessons.

The respondents in the intervention group were grouped into ten groups of twenty members each as per the gestational age bracket. They were then introduced to the topics to be taught and explained what was expected of them during the sessions. This was to help the respondents understand the meaning and objectives of the teachings and therefore take responsibility and employ their potential in the prevention of neonatal morbidity and mortality. The grouping arrangement was meant to help the respondent, being among peers who understand the same youth language and have almost similar gestational feelings to exercise freedom of expression in a conducive and relaxed environment. The final step was the follow-up of the neonates. The evaluation was both formative and summative, carried out at the end of every lesson to assess the understanding and knowledge retention of the respondents and at the end of the research.

3.8.1: Key informants

Six (6) health care providers (five nurse/midwives in charges and one records officer), each from the antenatal clinic, Labour ward, Postnatal ward, the newborn unit, maternal and child health clinic and the in charge of the records office or their representatives were purposively selected and interviewed using a researcher administered interview guide (Appendix

10). The interview was conducted on one-to-one and in confidence in their areas of work. The respondents were assigned a secret code to enable them participate in the study to logical conclusion within the realm of confidentiality. The respondents were blinded of the control group. This was to avoid information bias.

3.8.2: Data Abstraction

I applied the logical level of data abstraction in which the data was described as fields or sources. The data in this study was collected based on the characteristics and the sources as indicated in table 4. Additionally, a systematic search of the literature was also employed. Such included review of articles that addressed neonatal mortality rates. Abstracted data also addressed study design, interventions in previous studies, study setting, study population and risk factors contributing to neonatal mortality.

Table 1.3: Data Abstraction

Characteristics	Fields/Sources	Literature search
Demography	Age, marital status, education level, parity	Data bases: BMC, PubMed, Open access, Research Gate Individual articles, conference presentations
Risk factors	Predisposing, reinforcing and enabling	
Sample size	Intervention, population sample (226) Control population sample (226)	
Population focus	General population of expectant mothers	
Target population	Respondents ≤ 19 years, Key informants.	
Study setting	Busia County Referral Hospital	
Quality score	Adjustment for confounding variables, (Yes or No), pre-testing data collection tools	
Duration of study	Twelve (12) Months,	
Study design type	Interventional Randomized Controlled Trial	
Intervention	Evidence -based Teenage Health Education	
Outcome measures	Reduction in Neonatal Mortality	
Results	Analysis, presentation, reporting, dissemination	

3.8.3: Confounders

The looming confounding variables included current poor maternal health status in both groups. I eliminated this confounder at the eligibility stage of the study. The respondents in either group were assessed as indicated in section 3.6.1 and any of them who showed features of ill health or nutritional challenges was excluded and arrangements made to have her treated or/and nutritionally counseled at the facility. The other confounders were also merged at the analysis stage in terms of maternal age and gestational period in the two groups. This was

assessed through comprehensive history taking; antenatal examination and antenatal profile (see section 3.6.1).

3.8.4: Pre-Test Study

This was carried out on 10% of the study population; 52 respondents (cases, n=26 and Controls, n=226) between December 2017 and February 2018. This was done to test the validity and reliability of the data collection tool using Chronbach's alpha.

3.8.5: Data Collection Procedures

Materials: The following items were purchased; notebooks, pens, markers, photocopying/printing papers, coloured labels for coding, foolscaps, a laptop and storage disks. The following items were borrowed from the hospital clinic; ANC and baby care posters and flip charts, infant weighing scale and a baby model from Busia KMTC.

3.8.6: Data Collection Instruments

In this study, both quantitative and qualitative methods of data collection were used. Primary data was obtained using semi-structured, researcher-administered questionnaires (Appendix 9) from the expectant respondents and an interview guide for key informants (Appendix 10). In addition, a checklist (Appendix 11) was used to obtain baseline and secondary information from the health facility records. The County Demographic Health Surveys were still in the process of being established to take place every five (5) years. However, the County still

relies on the data from the National KDHS which is usually conducted every five years. These instruments were developed in English by I and verified by the supervisors and the statistician.

3.8.6.1: Step 1: Baseline data collection

i). Checklist for the baseline data were filled with the help of the health records staff in the first two weeks of the data collection period

ii). Questionnaire

The questionnaire was developed in English. The content validity was verified by the statistician and research supervisors. It comprised closed-ended questions to capture the social demographic characteristics such as age, gender, level of education, marital status and number of children. The questionnaire was divided into two sections; 1): demographic data and 2). Data aligned to specific objectives 1, 2, 3, 4, 5 and 6 herein outlined (appendix 9). It was fairly easy and short, taking approximately 5-8 minutes. The research realized roughly 90% response rate (10% attrition rate) after the questionnaires were filled and returned. This was because some clients had change of mind and came back to council their questionnaires. However, the number further reduced after data cleaning, leaving a response rate of 85.6%.

Administering the questionnaire

The questionnaires were administered to the selected respondents on the first day of sampling and enrollment into the study for both groups. The process was repeated on Mondays and Wednesdays for the expectant teenage mothers attending the clinic until the number of

n=264 (intervention group) and n=264 (control group) was attained. Data collection took approximately eighteen (≈ 18) weeks from 12th March 2018 to 11th July 2018. This timing was subject to adjustment based on the availability of the respondents. This translated into administering approximately 15-16 (7-8; intervention and 7-8; controls) questionnaires per day.

Figure 1.3 illustrates the flow of how the questionnaire was administered.

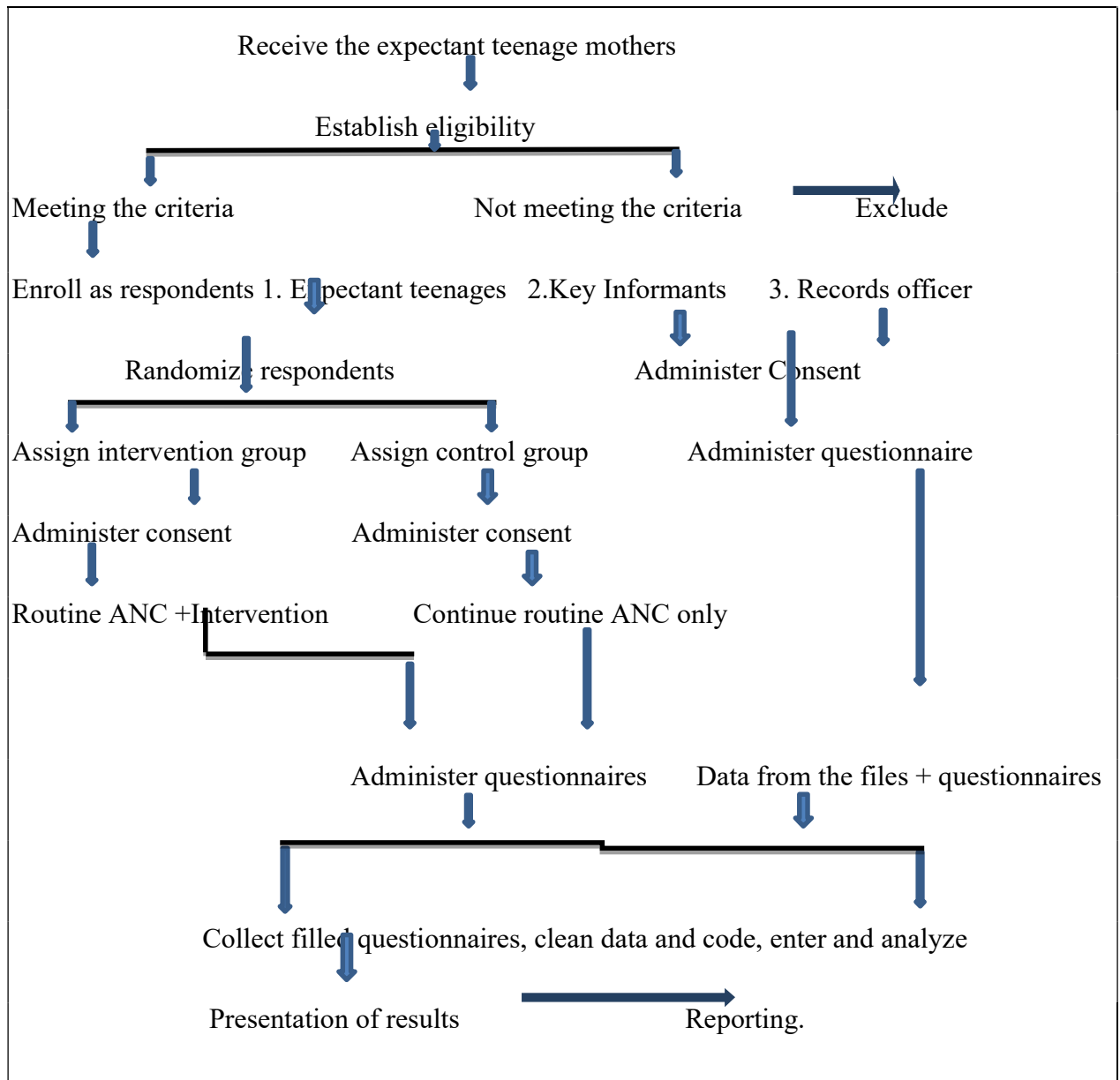


Figure 1.3: Questionnaire Administration Flowchart (Developed by Researcher, 2017)

iii). Key informant interview guide

The interview with key informants was individualized and guided. The respondents were six (6), one from antenatal clinic, labour ward, newborn unit, postnatal/MCH, FP clinic and

records department. The schedule consisted of eight (8) items. This took place in the side rooms in their stations with one key informant being interviewed per day to a total of six days). The items were qualitative in nature, the responses being narrative except for the records officer. The schedule was relatively short lasting about 3-5 minutes per informant

3.8.6.2: Step 2: Intervention Procedures

The intervention procedures began in March 2018. The planning phase involved working with the Nurse/Midwives in charge of the antenatal clinic who introduced I to the clinic layout and staff, the client charter, client flow and CHVs. I then trained the Community Health Volunteers for 2 hours on how to relate with the respondents and guardians, recognize maternal and neonatal danger signs, signs of onset of true labour, how to carry out a quick first examination of the baby (for those born at home or before arrival to the facility) and prompt referral of neonates at risk to health facilities. Later they were provided with the list of names and telephone numbers of the respondents from the intervention group living within their areas of operation (local administrative wards) plus I's mobile number. Each of them was required to identify those mothers and monitor them. This was not a problem since they had already known them during community mobilization and sensitization on family planning. They were not required to write notes regarding any mother but straight away call I and give the information. Their main duty was to monitor the respondents, remind and encourage them to keep their clinic

appointments, choose to have their babies assisted by a skilled health care provider. In the event that a baby was born at home, the CHVs would facilitate the transfer of the mother and baby to the hospital. They were also supposed to identify and advise hospital care for the sick neonates and to report any neonatal deaths that occurred at home. They would advise the mothers on family planning methods.

The necessary materials and equipment were assembled and kept in the provided classroom in readiness for the sessions. The neonatal manikin was borrowed from the Busia KMTC skills lab. The staff in the antenatal clinic was informed of the intervention dates and times by the in-charge as per the schedule provided (appendix 14) by I. The clinic return dates and dates for the intervention sessions were the same to reduce the number of times to the clinic for the mothers. The examination space was available and therefore many mothers could be attended to at any one given time. The intervention mothers were attended to at the same time among others in the usual way in the antenatal clinic. Therefore, there was no disruption of services as there was no separate queue for teenage mothers. After the routine antenatal check, the mothers with the pink label (intervention group) on their record books would be assembled in the room that had been allocated for the sessions. The introduction was done, starting with respondents, followed by the CHVs. I introduced self and explained to the respondents that, they would meet every time they came for the clinic appointment and that they would also be meeting

the CHVs in their respective villages or otherwise communicate on phone. Consents were taken and exit questionnaires administered This was repeated for all the 10 groups.

The first group of respondents begun their sessions on 19th March 2018 and the last group completed the sessions on 6th August 2018. In the session room, the seats were arranged in a circular way to facilitate vicinity of every respondent and to promote audibility. The mothers who had carried note books were allowed to use them but I emphasized that they were not necessary. This was to safeguard the mothers who did not know how to read and write and also check on information spillage. Most respondents could understand English but fluently spoke Kiswahili although occasionally some would share with the others in the local language probably for clarification.

Each session started with a prayer and then norms were set, to include putting phones on silent or off, respecting each other's views, listening to each other and respecting time. Time allocated was one hour and thirty minutes in which three topics were covered. The topics were taught by I, followed by open question and answer session and contributions. Each respondent gave her version of the story as understood on a particular topic and the rest critiqued. The respondents shared issues of concern with the group. There were arguments but consensus was always reached with my assistance.

I organized the topics in line with the objectives but also explained and clarified emerging issues from the respondents. The topics covered the same information as in the clinic

but now tailored to the group. The essence here was to approach health education from the perspective of the respondents. This promoted ownership of the issues by the respondents, hence the desire to counteract them. It gave them the opportunity to think reason and make informed decisions. I took notes of the sessions and later analyzed them. The respondents were encouraged to attend all or at least two (2) out of the three planned sessions.

i). Implementation of the Intervention

The selected respondents were organized in 10 groups of 20 members based on their gestation period. This was to foster understanding of the intervention sessions since needs of such groups were almost similar (not stratification). Such groups were; 26-30, 31-34 weeks gestation. The choice of groups was also based on their return dates, since the clinic had a pattern of issuing such dates that follow the gestation age ranges. This was also meant to facilitate group interactions, discussions and demonstrations. Each group identified a team leader from among themselves, who coordinated the activities of the group and also acted as a link between the members, the CHVs and I. Each respondent was attached to a respective area Community Health volunteer, whose role was to assist I in following up the respondents in their homes. Each group was given a harmonized date of appointment such that the session dates followed the routine of the antenatal clinic return dates. Groups met each time they came for the clinic visits. This was to maintain continuity of care and consistency in sessions.

ii). Evidence-Based Health Education

The health education intervention emphasized the respondents' perspective and experiences through the journey of pregnancy, labour, childbirth, postnatal, breast feeding and newborn care. Intervention sessions were based on three tenets; (i) **predisposing factors** in which the respondents were taken through characteristics that affected behavior and therefore ability to make decision in order to reduce neonatal morbidity and mortality. Such included; lack of knowledge, cultural beliefs, place of birth, use of skilled service provision and values and attitudes among others. (ii) **Reinforcing factors:** the respondents were engaged in discussing the rewards and punishments that either strengthened or modified their behaviors during pregnancy, labour, childbirth, breast feeding and neonatal care. These included acts of their parents and guardians; effects of social and peer support, acquisition of self-reliant skills and development of coping mechanisms. (iii) **Enabling factors:** I attempted to answer the question "How can the respondents manage through pregnancy, labor, childbirth, postnatal period, neonatal care and breastfeeding?" The health education emphasized the identification of the resources available or required to help reduce neonatal morbidity and mortality; programs supporting neonatal health, County neonatal care services, awareness campaigns and accessibility to resources and services. The sessions were conducted as outlined below.

Lesson 1

Topic: Risk factors associated with neonatal morbidity and mortality among neonates born to respondents in Busia County Referral Hospital.

Lesson objectives: -Identify and explain the risk factors.

-Describe the mitigation measures.

Variables addressed:

- **Predisposing factors:** characteristics that affect behavior and ability in decision-making; knowledge, cultural beliefs, maternal co-morbidities, genetics, place of birth, skilled service provision, values and attitudes.
- **Reinforcing factors:** rewards or punishments meant to strengthen or modify the behavior of the teenage mothers, their parents and guardians; family, social and peer support, self-reliant skills and positive coping mechanisms.
- **Enabling factors:** resources required to reduce neonatal morbidity and mortality; programs supporting neonatal health, County neonatal care services, awareness campaigns, health education, availability of and accessibility to resources and health services, infrastructure, finances and new skills gained.

Teaching aids: posters, flip charts

Method of teaching: interactive

- Explained the terminologies and asked the respondents to list at least 5 factors in each category while demonstrating understanding of the factors listed.

Evaluation: question and answer session, clarifications, respondents' understanding of the topic.

Plan of action: Respondents to identify more factors from parents or guardians and categorise them starting with the most pressing factors that require immediate actions and solutions and share in the next session.

Lesson II

Topic: Peer, family and social support systems

Lesson objective:

- Explain the role of support systems during pregnancy, labour, childbirth, postnatal, breastfeeding and neonatal care in reducing neonatal morbidity and mortality

Variables addressed

- Acceptance of the pregnancy, cultural practices regarding teenage pregnancy and childbirth, relationships, comfort,
- Stigma and rejection, physical/emotional and psychological support, counseling, birth preparedness and complication readiness, birth companions and caretakers, place and mode of birth, breastfeeding, finances, coping strategies etc.

Teaching aids: Posters, flip charts, information leaflets, demonstration

Method of teaching

- Asked the respondents to list at least 5 comfort measures
- Name types of support they received or expected to receive
- Name sources they expected support from
- I explained the importance of such supportive measures

Evaluation: respondents demonstrated understanding by identifying different types, sources of and the need for the support.

Plan of action

- Respondents answered the question; why they needed support.
- Respondents shared their experiences
- Respondents identified new roles and skills that required support

Lesson III

Topic: Antenatal Care.

Lesson objectives

- Explained at least five anatomical structures related to pregnancy and childbirth.

- Described the body changes in pregnancy (physiological, psychological, emotional, physical), antenatal exercises, emerging issues and the importance for consistent clinic visits
- Explained the risks associated with pregnancy (drugs/substance abuse, cigarette smoking, alcohol consumption, pica and how to avoid them.
- Co-morbidities, malaria prophylaxis, iron supplements, vaccination (TT)
- Antenatal profile, routine tests (urinalysis, Hb, RBS, Serological tests)
- Minor ailments and discomforts of pregnancy and the management
- Danger signs in pregnancy and prevention or mitigation
- The role of exercises, sleep and rest
- Physical examination, self-breast examination.
- Clinic appointments

Variables addressed:

- Physical, psychological and physiological changes, minor ailments of pregnancy (nausea, backache, tiredness etc), danger signs (persistent headache, per vagina bleeding, disturbed vision, leg swelling), signs of onset of true labor (show, breakage of bag of membranes, rhythmic increasing contractions) and clinic appointments.

Teaching aids: posters of different trimesters, poster of body systems, fliers and flip charts

Method of teaching

- Asked the mothers how much they knew about pregnancy, internal fetal growth, weight gain, changes in abdominal size and shape, size of breasts
- Explained quickening, pressure symptoms, prenatal exercises (Kegels)
- Discussed fear of labour and child birth, process and birth plan (mode and place of birth, time to go to hospital and how), spontaneous vertex birth or caesarean section
- Describe fetal movements and fetal heart rate
- Discussed house chores and pregnancy, the role of nutrition and iron supplements

Evaluation:

- Allowed questions and answers to gauge understanding of the subject by the mothers
- Asked a volunteer to re-cap
- Take-home message *“Remain active during pregnancy, exercise. Pregnancy is not a disease but normal physiological process”*

Plan of action: demonstration of Kegel exercises to strengthen the pelvic floor muscles in preparation for labour and child birth; (empty your bladder, sit down, tighten your pelvic floor muscles-like holding urine back and count up to 20, relax the muscles-count up to 20, repeat this morning, afternoon and night.

Lesson IV

Topic: Neonatal morbidity and mortality

a). The ill neonate

- Described the neonatal danger/warning signs (hotness of the body, refusal to feed, vomiting, loose stool, skin and eye yellowness, irritability), what to do if they occurred (seek immediate medical help).
- Explained neonatal treatment seeking behaviors (traditional, modern, over-the-counter drugs, prayer).

Variables addressed

- Neonatal danger signs, prematurity, low Birth Weight, congenital malformations, neonatal birth complications/injuries, neonatal infections, cultural beliefs, prevention-role of breastfeeding, neonatal feeding and neonatal treatment-seeking behaviors

Teaching aids

- Newborn manikin
- Posters, baby wear and covers
- Clinic and treatment records

Plan of action: Return-demonstration on dressing the neonate to keep warm using mankin, assessing for body hotness by feeling.

b). Neonatal death

- Defined neonatal death, possible risk factors, cultural beliefs, care of the dead neonate, grieving
- Reporting the death/obtaining death notification/death certificate
- Disposal of the body (burial rights)

Lesson V

Topic: the normal neonate, Postnatal, Family planning

a). The normal neonate

- Described the characteristics of the normal newborn,
- Skills to be gained;
 - neonatal hygiene; baby bathing and/or top-tailing, skin care, cord care, changing the diapers, baby dressing to keep warm and daily examination of the neonate to detect emerging issues.
 - Early initiation/ exclusive breastfeeding, latching, positions during breastfeeding, advantages (relaxation, comfort, satisfying, immunogenic) burping, bonding, rooming- in

- Complementary/supplementary feeds
- Clinic record card, immunization (BCG & Polio)/ clinic appointments.
- Birth notification and registration

Teaching aids:

- Newborn manikin
- Water and cotton alcohol swabs for top-tailing and cord care
- Baby wear and covers
- Copy of birth notification
- Clinic record card

Evaluation:

- Allowed questions and discussion/experience sharing
- Volunteer to recap

b). Postnatal Care

Lesson Objective: To explain the postnatal period and care

Variables addressed: definition, postpartum changes (physical, physiological, psychological), personal hygiene and postnatal checkup, skills to be gained.

Teaching aids: flip charts, posters, information flyers

Method of teaching: Assess the respondents' knowledge of postnatal care, personal hygiene, cultural beliefs, 'returning to normal'

- Demonstrate and promote exclusive breastfeeding and its importance, importance of postnatal clinic

Evaluation: Respondents demonstrated the correct way of breastfeeding

- recap, question and answer session

Plan of action: I with the help of the midwives examined the mothers in the ward and reminded them the skills required before discharging them home

- The CHVs examined mothers who gave birth at home

c). Family Planning (FP)

Lesson Objective: To explain Family Planning

Variables addressed; methods of Family Planning, Postpartum Family Planning

Teaching aids: flip charts, posters, information flyers, samples of FP commodities

Method of teaching: - describe different family planning methods, clarify myths and legends

-discuss cultural beliefs and practices, barriers, advantages.

Evaluation: -Seek respondents' understanding of the methods, -experience sharing among the respondents, -Recap, question and answer session

Plan of action: assessed knowledge and understanding of the respondents on family planning after the session

Table 2.3: Intervention Implementation Schedule

Lesson I	Topic; Time: 1.5hrs	Lesson objective	Variables addressed
Identifying the risk factors for NNMM	Risk factors	To identify, describe and explain the risk factors and mitigation.	Predisposing/Reinforcing and enabling factors
Lesson II	Time: 1.5hrs		
Determine the social support system	Peer, family and social support systems	To explain the role of social support systems during pregnancy, labor, childbirth, neonatal care, breastfeeding	Birth companion, birth preparedness and complication readiness, finances and neonatal care
Lesson III	Time: 1.5hrs		
Determine the difference in proportion of ANC visits and hospital births	Antenatal Care.	To explain and describe the body changes in pregnancy, and the emerging issues	Physical, psychological and physiological changes, minor ailments, danger signs, signs of onset of true labor and clinic appointments.
Lesson IV	Time: 1.5hrs		
To compare the NNMM among the intervention and control	Neonatal illness and deaths	Define the terms and explain causes of neonatal illness and deaths.	Neonatal danger signs, prematurity, LBWt congenital malformations, birth complications/injuries, infections, cultural beliefs, prevention and treatment seeking behaviors
Lesson V	Time: 1.5hrs		
Describe the uptake of MCH/FP, postnatal care	Normal neonate Skills to be gained, postnatal care, Family Planning	To explain the importance of MCH/FP/Postnatal services Care of the normal neonate	Postnatal checkup, exclusive breastfeeding, primary immunizations, neonatal hygiene and cord care and methods of Family Planning, clinic appointments

iii). Teaching Aids

These were materials used during the sessions. Such included; posters and information cards (Appendix 13) depicting the factors influencing neonatal health, morbidity and mortality. Others were pamphlets, Flip charts, Flyers, length boards, tape measures, leaflets and newborn manikin.

3.8.6.3: Step 3: Follow-up and Evaluation

The respondents were followed up individually to ensure that what was learned during the health education sessions was practised. I did this, assisted by the Community Health Volunteers (CHVs) to whom mothers from their areas of operation were allocated. After childbirth, the neonate was examined to rule out any congenital malformations that would otherwise compromise its life. This was done in the hospital by the midwives and by the CHVs for mothers who gave birth at home. The neonates were then followed up for health monitoring (breastfeeding, cord care, hygiene, weight gain, immunizations, danger signs, illness and traditional treatments among others) and advised accordingly. Any neonate at home found with issues was referred to the facility for further management.

All respondents in the intervention group were followed up after two weeks at home either physically by the CVH or on phone by I and booked to return to the clinic four weeks after birth for postnatal check-up and neonatal status assessment. During the visits, the neonates born

at home were immunized and the respondents commenced on Family Planning methods, for those who embraced the idea. Similarly, the mothers were advised to take a postnatal checkup after four weeks. Evaluation was both formative and summative.

3.9: Quality Assurance Procedures

3.9.1: My Responsibilities as a researcher

I was responsible for all activities associated with the conduct of the study. Compliance with Ethics and Research Committee guidelines, Institutional policies and ethical principles was ensured. All issues and correspondences about the study as well as study planning, training for the community health volunteers, documentation and records, and purchase of/or borrowing required equipment, preparation of the study site, tools, instruments and respondents were handled solely.

3.9.2: Pre-test study

The purpose of this pre-test study was to assess for validity and reliability of the instruments. The pre-test was carried out at the Busia County Referral Hospital antenatal clinic from November 2017 to February 2018 on 10% of each of the two groups; cases/controls, (10/100x 264= 26.4), n=26/26. The same procedures were followed as in the main study. The respondents were respondents aged 19 years and below at a gestation of 26-34weeks.

3.9.3: Validity of the Research Instrument

A pre-test study at 10% of the sample size was carried out at the Busia County Referral Hospital prior to the main research on the questionnaire only. The respondents in the pre-test study did not participate in the main study since by the start of the main study; all had given birth and had already been evaluated. The instrument was validated by the statistician with input from the research supervisors. Content validity was applied to ascertain the validity of the research instrument. The feedback from supervisors was used to improve the validity of the questionnaire. Such feedback included harmonizing the questions, merging some items and improving on the length of the questions.

3.9.4: Reliability of the Research Instruments

3.9.4.1: Pre-test study results

A pre-test study was carried out prior to the main study on the questionnaire of 52 teenage mothers, (26 intervention cases and 26 controls), i.e. 10% of the sample size ($n=528$; $52/2=26$). Pre-test data was used to ascertain for reliability of the research instrument and to confirm that the research instruments could generate same and consistent results when used elsewhere (Kimberlin, & Winterstein, 2008). Pre-test data was used to test for reliability using Cronbach's alpha. The Cronbach's alpha is software that has standard range from 0 to 1. The closer Cronbach's alpha coefficient is to 1.0, the greater the internal consistency of the items in

the scale. According to George and Mallery (2016) if the value of alpha is >0.9 , it is rated as ‘Excellent’, >0.8 is rated as ‘Good’, >0.7 as ‘Acceptable’, >0.6 is Questionable, >0.5 is rated as ‘Poor’, and <0.5 is Unacceptable.

The results of the pre-tested research instruments enabled me to determine the consistency of responses to be made by respondents and adjust the items accordingly by revising the document. The research instrument was developed carefully to fit the research design and the plan of data analysis so that the data collected facilitated the testing of questions. The results of the reliability tests were as shown in table 6. The study findings indicated that the values of Cronbach’s Alpha for the proportion of teenage mothers who completed the ANC visits was 0.727, risk factors was 0.722, the social support system was 0.879 and comparison of the neonatal mortality was 0.715. All the values were above 0.7 implying that the research instruments used for data collection were reliable.

Table 3.3: Reliability Test Results

Variables	Cronbach's Alpha	No. of Items
Proportion of respondents who completed the ANC visits	.727	16
Risk factors	.722	12
The social support system	.879	74
Compare the neonatal mortality	.715	36

The results showed that this instrument could be utilized in similar studies and the results would be reliable.

3.10: Ethical considerations

Approval was obtained from the Ethics and Research Committee of Kenyatta National Hospital and University of Nairobi (KNH/UoNERC, Ref: KNH-ERC/RR/588), permission from Busia County administration, Busia County Referral Hospital Administration and a written consent from the County MOH, Busia County. The research was also authorized by the National Commission for Science, Technology and Innovation (Ref No. NACOSTI/P/17/55830/19857). The issues encountered included reluctance by some guardians of the under 19year old teenage mothers to sign the consent, difficulties in obtaining the true information; some respondents faked their names, telephone numbers as well as residential areas. However, any identified false information was followed up in the clinic and also using the community health volunteers. The guardians were taken through the translated consent to facilitate understanding and winning their cooperation. A few guardians and parents asked for payment but they were explained that the services were free as per the free maternity guidelines and that clients were not normally paid to be served.

3.11: Verification of neonatal Live Status

Obstetric Imaging of the expectant respondents to verify whether the fetus was viable or not were carried out if such needs a rose. Ultrasonographic tests to the mother to verify the viability of the fetus were carried out if necessary. Monitoring of fetal heart rate every visit and reporting of fetal kicks by the mother were part of the procedures to verify the viability of the

fetus. History from the mother about reduced or cessation of fetal movements would denote fetal demise and therefore prompt action would be taken. The mothers were advised to report to the CHV or the nearest health facility immediately they noticed any unusual sign as explained during the education sessions. At birth, the APGAR system was used to verify the living from born-dead neonates. This system has been widely employed, especially in the labour wards throughout the world and has proved beneficial in assessing the neonates' adaptation to immediate extra-uterine life. For the mothers who gave birth at home, the neonate's first cry and skin color were used to evaluate the status of the neonate at birth.

3.12: Data Management Plan

This section addressed all aspects of data management to include data cleaning and editing, data coding and entry, data analysis, data storage, presentation and reporting. All variables were measured in proportions and compared to the findings of the control group.

Table 4.3: Study Measurements

Variable	Data Sources	Measurement
Current maternal age	Respondent's response	Nominal: Exact age at the time of study
Education level	Respondent's response	Ordinal (Levels)
Marital status	Respondent's response	Frequency (married, single)
Maternal co-morbidities	Hospital Records	Rates (%)
Number of ANC visits	Clinic records, respondent's response	Frequency
Family planning uptake	Respondent's response, FP clinic records	Rates
Reduced co-morbidities	Hospital/County records	Rates
Premature labour	Hospital records	Nominal
Reduced delays.	Hospital records	Ratio
Neonatal age at birth	Respondent's response, hospital records	Rates
Place of birth,	Respondent's response, hospital records	Descriptive (home or health hospital)
Mode of childbirth	Hospital records	Normal/caesarian section
Sex of neonate	Respondent's response	Dicotomus (male or Female)
Birth Weight	Health hospital records	Categorical
Birth complications	Health hospital records (asphyxia, RDS, Hypothermia)	Prevalence
Prematurity	Neonatal characteristics, County vital statistics, Hospital reports, pregnancy risk assessment, indicators	Ratio
Low birth weight	Anthropometric measurements	Pearson's correlation co-efficiency
Exclusive breastfeeding	-	% of mothers practicing
Neonatal Morbidity	Service utilization Indicators,	Presence of diagnosed conditions, Rate, correlation
Neonatal Mortality	Hospital data, respondents.	Rates (cause- specific, proportionate, death – to-cause ratio)
Practice Neonatal hygiene	Respondent's practices (bathing, cord care)	Frequency, outcome

3.12.1: Data Cleaning and Editing

The questionnaires were carefully scrutinized for completeness, accuracy, consistency, uniform entry and the overall orderly arrangement to facilitate coding. This was done as follows; field editing-review as the questionnaires were being filled and collected at the close of each day by I. Editing entailed examining the collected raw data to detect errors/omissions. Data cleaning addressed data consistency, treatment of missing values (intended data to be collected but were not), unanswered or unknown data and outliers; observations that were different from the intended. This resulted in about 76 questionnaires being discarded.

3.12.2: Data Entry and Coding

The data recorded in the research instrument was entered into the computer to form a database using excel then exported to EpiData version 3.1 software. This version was useful in optimizing documentation as well as detecting errors. The entered data was further exported to STATA version 8.0 statistical software for analysis.

3.12.3: Data Analysis and Presentation

The STATA version 8.0 was used for statistical analysis of the entered data by virtue of its advanced properties. The data was imported from EpiData version 3.1 and presented in graphs, percentages, charts, means, modes, median and frequency distribution tables for the quantitative aspects and themes for the qualitative aspects.

The following statistical tests were applied:

- T-test; to compare the observed means for the two groups (intervention and control)
- Chi –Square; to check the proportions between categorical variables (neonates, maturity; premature and full-term neonates) in both groups
- Multivariate Logistic Regression to check the association of the two categories; dead/alive neonates since its outcome is usually dichotomous (measured by probability' $\pi=IP(Y=1)$, odds or log-odds).
- The CI; 95%. Cut-off point was 0.05; <0.05 (significant) and > 0.05 (insignificant)

The Main outcome variable was 'Reduced Neonatal Mortality'. The expected difference of neonatal mortality was 10% between the intervention and control groups.

3.12.4: Data storage

For confidentiality purposes, the data collected and analyzed are stored in compact disks and personal laptop protected by a password. The data would only be accessed by the supervisors until when the dissertation will be ready then results will be disseminated as appropriate.

3.12.5: Reporting

While there are many reporting software, this study utilized Microsoft word 2010. All the findings, discussions, conclusions and recommendations were addressed during reporting.

3.12.6: Study Results Dissemination Plan

I planned to disseminate the information as follows; a copy of the findings to be submitted to Busia County Referral Hospital where the study was undertaken. A poster has been developed to address key findings useful in teaching the mothers in the antenatal clinic and wish to give this to the staff in the antenatal and postnatal clinics of BCRH. I intends to publish this research paper to avail information for those interested in teenage motherhood and neonatal health to benefit. A copy will remain in the School of Nursing Sciences, University of Nairobi library for reference and onward citations.

3.13: Study Limitations and mitigation

The limitations included non-reporting of the neonates who died at home thus painting a grossly low neonatal mortality prevalence rate. From the hospital records, misreporting, poor reporting or inaccurate information about neonatal mortality were concerns that needed to be addressed. This has actually made Busia not visible in the national statistics on neonatal mortality. This is because the society does not value neonatal mortality neither does the hospital keep accurate records of the same. I explained to the respondents the importance of reporting all sick and diseased neonates and the need to obtain death notifications and certificates. In a letter addressed to the Hospital Chief Executive, I requested the Hospital and the local administration in collaboration with the County health sector to encourage their subjects to register all neonates

born alive, dead or died later before 28 days of life in the County. This would go a long way to streamline the records for the neonates unlike the current infant register.

3.14: Study Assumptions

In this study, I assumed that, the views of the selected respondents adequately represented the views of the entire expectant teenage population in BCRH. It was also assumed that the intervention employed here was the first of its kind in Busia and therefore, would draw attention to adopting it and that the study would be generalizable to the County health facilities. I also pledge my availability for consultation.

3.15: Study Closure Plan

Since the mothers gave birth at different times, I organized for three closure meetings at two-weekly interval in September and October 2018. The closure meetings were held with the respondents who were available at the four -weeks (28 days) and also served as the final follow up for the neonates. I clarified the emerging concerns from the mothers and guardians as they arose. I registered my appreciation to both the staff and the mothers for their support and cooperation throughout the study period. They were then discharged from the study but encouraged to consult since they had my contact telephone number. I met the key informants in November 2018 to formally discharge them from the study. During this meeting, the Nursing Officer in charge was away but her representative attended although in and out. Clarifications concerning the study and any emerging issues related to the study were addressed at this point.

The borrowed equipment were returned to the in-charges of the respective areas. I locked the data in December 2018 to allow the other processes of data cleaning, coding, entry and analysis. I hoped to complete the report in three months' time (by the end of April 2019) with the help of my supervisors. Once the thesis is finalized, accepted and the final defense done, dissemination of the results will follow.

3.16: Chapter Summary

This chapter addressed the following key items:

1. The study methods and procedures applied and their rationale.
2. The validity and reliability of the study instruments.
3. The software and statistical tests applied in data management.

CHAPTER 4: STUDY FINDINGS

4.1: Introduction

This chapter focused on the study findings and comparisons for both the intervention and the control groups. The findings were organized in three parts; baseline, intervention and follow-up and evaluation and sequentially as per the study objectives. Data coding, entry and cleaning was done using EpiData version 3.1 and analyzed using STATA version 8.0. The results were reported using Microsoft Word and Microsoft Excel. The qualitative data was organized in themes and reported in prose.

4.2: Part 1: Baseline Results

Three hundred (300) neonatal files for the year 2017 were identified from the registry but only one hundred and six (106) files had the complete information that was required for this study. Baseline data was extracted as follows; the maternal age that was below 19 years; home births but admitted to hospital for some reason accounted for 58.5% (n=62), hospital births- 41.5% (n=44). Among the hospital births, spontaneous vertex delivery (SVD) accounted for 73.6%, assisted deliveries-2.8%, caesarean section-23.6%, term births-63.3%, preterm births-35.8% and still births- 0.9%. Neonates admitted from home made up 46.2%, referrals-in -46.2%, inpatient- 7.6%, discharged home - 71.7% and deaths accounted for 28.3%. Morbidity; neonates admitted from home made up 46.2%, referrals-in, 46.2%, facility births-inpatient 7.6%. Mortality: 28.3%. Factors implicated included poor infrastructure and long distances from the facilities (89%),

neonatal infections (83.3%), prematurity and low birth weight especially due to attempted abortions (76.4%), delay to seek medical assistance due to traditional beliefs (72%) and non-breastfeeding due to mothers abandoning the neonates (61.1%). There was no referral-out reported among the identified files. Four hundred (400) files for the postnatal mothers were retrieved. Only 9.9% (n=40) mothers had gone for postnatal checkup. This was because, the mother either developed a problem or had been booked to come for checkup after caesarean section or the neonate fell ill and in the process the mother was also checked. Twenty percent (20%, n=80) of the mothers had sought family planning methods. The reasons for the low family planning uptake were attributed to cultural beliefs and fear of the unknown.

4.3: Socio-demographic characteristics

4.3.1: Respondents' age

Most, 97.8% (n=221) of the respondents in the intervention group were aged between 16-19 years and 2.2% (n=5) were aged between 12-15 years. Similarly, most of the respondents, 89.4% (n=202) in the control group were age 16-19 years and the rest, 10.6% (n=24) were aged 12-15 years. The mean age was 17.8, the median was 18 and the mode was 19 years respectively.

4.3.2: Reasons for respondents being out of School

Respondents in the intervention group who were not in school (n=190); 43.8% (n=83) said that it was due to being pregnant, 24.3% (n=46) had no fees, 13.7%

(n=26) were married and 2.7% (n=5) had never been to school, and lastly, 15.5% (n=30) did not give any reason as to why they were not in school.

Similarly, of the n=183 respondents who were not in school in the control group, 46% (n=84) said that it was because they were pregnant, 18.6% (n=34) gave no reason, 16.4% (n=30) had challenges with school fees, 13.0% (n=24) said they were married and lastly 6.0% (n=11) had never been to school. 6.0% (n=11) did not give any reason as to why they were not in school.

4.3.3: Level of Education

The majority, 83.2% (n=188) of the respondents in the intervention group had attained secondary level up to form 2 first term. 6.6% (n=15) respondents reached tertiary level but dropped out midway. Eight percent, 8.0% (n=18) had managed primary level and 2.2% (n=5) had never been to school.

The respondents in the control group, 81.9% (n=185) had attained secondary level and like in the intervention group, most had dropped out of school at form two. At tertiary level of education, 4.4% (n=10) attempted but did not complete the college. Only 8.9% (n=20) primary level and 4.9% (n=11) had never been to school.

4.3.4: Marital status

According to marital status in the intervention group, most were married at 73% (n=165). The marriages were either circumstantial or forced. The single respondents accounted for 26.5% (n=60) of the respondents, and 0.4% (n=1) did not give any answer.

Similarly, results in the control group, 69% (n=156) were married, while 31% (n=70) were reported as being single.

4.3.5: Parity

About the state of parity among respondents in the intervention group, 42.9% (n=97) had no child, 39.8% (n=90) had one child and lastly 17.3% (n=39) of the respondents had two or more children.

Among the respondents in the control group, 45.1% (n=102) had one child, 34.1% (n=77) had no child and lastly, 20.8% (n=47) had 2 or more children.

4.3.6: Respondents' Residence

The study results in the intervention group, showed that majority, 51.3% (n=116) of the respondents resided in rural settings while 47.8% (n=108) resided in urban areas, 0.9% (n=2) had no answer.

Results in the control group, showed that majority, 70.8% (n=160) of the respondents were from rural settings having come because of availability of resources while others

were referred from the periphery health facilities. The teenage mothers from the urban areas accounted for 27.9% (n=63) and lastly 1.3% (n=3) had no answer,

4.3.7: Persons living with the Teenage mothers

The results of respondents in the intervention group reported the following:

27.4% (n=62) lived with their parents, 26.5% (n=60) lived with their spouses, 14.6% (n=33) lived alone, and 31.4% (n=71) lived with other people (grandmothers, aunties, friends, grandfathers, distant relatives).

In the control group, 27.4% (n=62) lived with their parents, 26.5% (n=60) lived with their spouses, 14.2% (n=32) lived alone and 31.9% (n=72) lived with other people (grandmothers, aunties, friends, grandfathers distant relatives).

This distribution of who lived with the teenage mother revealed the instability and uncertainty of where the teenage should go after childbirth.

4.3.8: Teenage mothers' Occupation

In relation to occupation, majority of the respondents in the intervention group, 95.6% (n=216) were unemployed whereas 4.4% (n=10) of the respondents were temporarily employed. In the control group, 98.2% (n=222) were unemployed while 1.8% (n=4) were formally employed

4.3.9: Faith Affiliation

Concerning affiliate faith, most, 86.3% (n=195) of the respondents in the intervention group were Christians, non-Christians were 11.5% (n=26) and 2.2% (n=5) had no answer. In the control group, 86.3% (n=195) were Christians, non-Christians were 11.5% (n=26) and 2.2% (n=5) had no answer.

4.3.10: Monthly Income for the Respondents

Concerning approximate monthly income, all 100% (n=226) of the respondents and guardians in each group were earning less than 5,000 Kenya shillings.

4.4: Specific objective1:

Identify the risk factors for neonatal morbidity and mortality among neonates born to teenage mothers in the intervention group compared to the control group

Table 1.4: Individual Risk factors

Items	Intervention		Control	
	No	Yes	No	Yes
Maternal separation/ neonate	119(52.7%)	107(47.3 %)	118 (52.2%)	108 (47.8%)
Maternal infections	174(77.0%)	52(23.0%)	164 (72.6%)	62 (27.4%)
Non breast feeding	45(19.9%)	181(80.1%)	91(40.3%)	135 (59.7%)
Low Birth weight	146 (64.6%)	80(35.4%)	56 (24.8%)	170 (75.2%)
Prematurity	74(32.7%)	152 (67.3%)	79(35%)	147 (65%)
Neonatal infections	81(35.8%)	145(64.2%)	95 (42%)	131(58%)
Poor environmental sanitation	120 (53.1%)	106 (46.9%)	135(59.7%)	91(40.3%)
Multiple pregnancy and births	76 (33.6%)	150 (66.4%)	69 (30.5%)	157(69.5%)
Difficult childbirth/Birth complications/trauma	96 (42.5%)	130(57.5%)	107(47.3%)	119 (52.7%)
Congenital malformations	170 (75.2%)	56 (24.8%)	108 (47.8%)	118(52.2%)
Traditional beliefs and practices	163(72.1%)	63(27.9%)	169 (74.8%)	57(25.2%)
Poor maternal nutrition	198(87.6%)	28(12.4%)	174 (77%)	52 (23%)
Low socioeconomic status	104 (46%)	122 (54%)	113 (50%)	113(50%)
Lack of knowledge to recognize an ill neonate	129 (57.1%)	97 (42.9%)	114(50.4%)	112 (49.6%)
Delay to reach health facility	74 (32.7%)	152 (67.3%)	74(32.7%)	152 (67.3%)

The leading risk factors in the intervention group were; non breast feeding, n=181(80.1%), Prematurity, n=152 (67.3%), Delay to reach health facility n=152 (67.3%) Multiple pregnancy and births n=150 (66.4%) and Neonatal infections n=145 (64.2%) respectively

Respondents in the control group reported the following as the leading risk factors: Low Birth weight n=170 (75.2%), multiple pregnancy and births n=157 (69.5%), Delay to reach health facility=152 (67.3%) prematurity n=147 (65%) and non-breast feeding at n=135 (59.7%) respectively.

4.4.2: Community Risk Factors for Neonatal Morbidity and Mortality

The top prevalent factors comprised of inaccessible health facilities, 89.8% (n=203), poor infrastructure, 83.6% (n=189). This is explained by the long distance to be covered by the respondents before accessing the nearest health facility. Negligence, 81% (n=183) was reported by all parties. This was due to the associated stigma. Lack of emphasis on the care of neonates took 77% (n=174) and the fact that the community did not value neonatal health, 77% (n=174). This was evident from the fact that neonatal illnesses and deaths in the villages were never reported.

4.5: Specific objective 2:

To determine the social support systems for the teenage mothers.

4.5.1: Types of support systems identified by the respondents

- i). Parental relationship and support; persons to live with, love and affection,
- ii). Psychological support; acceptance, caring, affection, love, trust, and counseling
- iii). Information support; advice, encouragement, social interaction, dialogue),
- iv). Peer, community and social support; sense of belonging and identity,

v). Physical support; financial assistance, food, health services, shelter, clothing and recognition.

Sources of support were identified as family members, friends, relatives, neighbors, health workers, charitable organizations, local leaders, and County Government.

4.5.2: Respondents' place of stay after discharge from hospital

The study results in the intervention group showed the following: 34.0% (n=77) would go to their own houses since some had families to look after while others considered the comfort. 28.3% (n=64) opted for their mothers' houses considering the care. 23.5% (n=53) would go to other places (mothers' in-law, aunties, uncles, older siblings, friends). 14.2% (n=32) would go to their grandmother's houses since here they would be fairly accepted.

The respondents in the control group reported the following: 38.5% (n=87) chose to go to their grandmother's houses, 34.5% (n=78) opted for their own houses, 6.2% (n=14) would go to their mothers' houses, 20.8% (n=47) opted for other places (mothers in-law, aunties, uncles, older siblings and friends).

4.5.3: Neonatal Feeding

Respondents from the intervention group reported the following: 93.8% (n=212) of the total respondents breastfed, though not exclusively as required by the World

Health Organization guidelines since some went back to school of which some schools were far from home. In this respect, breast-feeding was supplemented with any other feed that could be made into paste or liquid form. 39.4% (n=89) of the respondents fed their neonates on cow's milk while 14.2% (n=32) of the respondents fed the neonates on porridge. The reasons for the haphazard neonatal feeding included traditional beliefs and practices, return to school by some teenage mothers. Some respondents left their neonates with the grandmothers to continue their usual lifestyles on the streets in town.

Respondents in the control group reported the following: 34.1% (n=77) of the respondents exclusively breastfed, 94.7% (n= 214) of the respondents breastfed plus supplements, 15% (n=34) gave cow's milk and 4.4% (n=10) gave porridge.

4.5.4: Care for the Neonate

Results from the intervention group reported the following: 24.3% (n= 55) of the respondents entrusted the care of their neonates to their mothers, 48.7% (n=110) left the neonates with the grandmothers and 2.2% (n=5) left their neonates with siblings, 1.8% (n=4) left the neonates with house helps and 22.6% (n=51) took their neonates along with them.

Control group reported the following: 17.7% (n=40) of the respondents entrusted the care of their neonates to their mothers, 3.1% (n=7) left the neonates with siblings,

2.7 (n=6) left their neonates with house helps, 1.8% (n=4) left their neonates with their partners, 21.2% (n=48) took their neonates along with them.

4.5.5: Ways of Sustainability

Respondents of the intervention group reported this: 35% (n=79) got financial support from parents, 19% (n=43) did small businesses, 4.9% (n=11) depended on their salaries/wages, 8.4% (n=19) were helped by their partners, 7.1% (n=16) Guardians, 15.4% (n=35) friends and 10.2% (n=23) by grandmothers.

Respondents of the control group; 34.1% (n=77) got financial support from parents, 12.8% (n=29) did small businesses while 4.4% (n=10) depended on their salaries, 7.7% (n=22) were helped by their partners, 14.6% (n=33) by guardians, 17.7% (n=40) by friends, 6.7% (n=15) by grandmothers, 8.4% (n=19) from salaries/wages.

4.5.6: Acquired Skills

Skills Acquired included breast feeding, accounted for n=35/110. How to carry out cord care n=6/110 (these six respondents had worked in the hospital as casual labourers and therefore had been exposed). Neonatal hygiene accounted for n= 35, neonatal sleep and elimination n=20 recognizing neonatal danger signs n=8, recognizing ill neonate n=5 and keep the neonates warm, n=36

In the control group, n=30 reported knowing how to breast feed, n=4 could do cord care, n=30 could clean the neonate, n=16 understood neonatal sleep and elimination, n=12 could recognize neonatal danger signs, n=13 could recognize an ill neonate and n=42 knew how to keep the neonate warm. n=13 could recognize an ill neonate and n=42 keep the neonate warm.

4.5.7: Family Social System

Regarding the family and social support system, the study results in the intervention group showed the following; 35.8% (n=81) of the total respondents reported having received minimal support, 33.2% (n=75) did not receive any support, 30.1% (n=68) received adequate support and 0.9% (n=2) had no answer.

Among the control group, the study results showed the following:43.8%(n=90) of the respondents reported having receive any support, 27.9% (n=63) received adequate support and 3.5% (n=8) had no answer.

4.5.8: Peer Support System

The peer group in this context referred to those who, the respondents considered as group of friends with whom they carried out similar activities and shared information. Among the intervention group, the results were as follows: 65.9% (n=149) reported **“bad peer support”**, 19% (n=43) reported **“good peer support”** and 15% (n=34) reported **“very good peer support”**.

In the control group, the study results were as follows: 50.4% (n=114) reported “**bad peer support**”, 29.2% (n=66) reported “**good peer support**” and 20.4% (n=45) reported “**very good peer support**”.

4.5.9: Source of Help

Respondents in the intervention group reported the following: healthcare providers 90.3% (n=204), parents 28.8% (n=65), spouses 27.4% (n=62), community 24.8% (n=56) grandparents 8.4% (n=19) and peers 7.1% (n=16)

The respondents in the control group reported the following: grandparents 73.9% (n=167), healthcare providers 56.2% (n=127), peers 22.1% (n=50), spouses 2.1% (n=50), community 33.6% (n=76), parents 78.3% (n=177), (n=186).

4.5.10: Available neonatal services

Intervention group; 51.3% (n=116) of the respondents did not have neonatal services available and/or accessible in their areas while 48.7% (n=110) had it.

Control group; 54.4% (n=123) of the respondents did not have neonatal service available and/or accessible in their areas while 45.6% (n=103) had it.

Distance covered; 38.9% (n=88) of the respondents in the intervention group travelled less than 5km to reach to their health service; 48.7% (n=110) travelled between 6-10 km and 12.4% (n=28) travelled between 11-15km

Control group: 27.0% (n=61) of the respondents travelled less than 5km. 72.1% (n=163) travelled between 6-10 km and 0.9% (n=2) travelled between 11-15 km to reach to their health service providers

4.5.11: Resources and Services Available at Nearest Facility

Intervention group reported the resources and services available at their nearest health facility as follows; 65.5% (n=148) of the respondents said Out/inpatient care services were available, 61.1% (n=138) said that immunizations were available, 36.7% (n=83) antenatal care. 44.7% (n=101) reported mostly referrals-out, 13.7% (n=31) reported breast feeding counseling, 11.1% (n=25), 1.8% (n=4) of the respondents reported availability of neonatal physical examination, 61.9% (n=140) family planning and 65.9% (n=149) stated that laboratory tests were available.

Control group; 56.2% (n=127) of the respondents reported that out/inpatient care services were available. 60.6% (n=137) said that immunizations were available. 47.3% (n=107) antenatal care services were available. 58.8% (n=133) referral services were available. Only 28.8% (n=65) of the respondents said breast feeding counseling services were available. 26.1% (n=59) health education for neonatal care, a very small number of respondents 15.5% (n=35), reported for Health education on neonatal danger signs, 16.4% (n=37) stated that

neonatal physical examination was available and 65.9% (n=149) stated that laboratory tests were available.

4.5.12: Role of Community in NNMM

Intervention group: 87.2% (n= 197) reported stigmatization and rejection. 83.6% (n=189) reported lack of support to the expectant/nursing teenage mothers. 78.8% (n=178) reported lack of reporting and proper records of the ill or deceased neonates. 69.0% (n=156) of the respondents reported that the community did not value the health of the neonates. 56.6% (n=128) reported poor recognition of the ill or diseased neonates.

Control group; 70.8% (n=160) of the respondents reported that the community did not value the health of the neonates. 68.6% (n=155) reported lack of support to the expectant/nursing teenage mothers, 61.9% (n= 140) reported stigmatization and rejection, 61.1% (n=138) reported lack of reporting and proper records of the ill or diseased neonates and 55.8% (n=128) reported poor recognition of the ill or diseased neonate.

4.6: Specific Objective 3:

Determine the difference in the proportion of respondents who completed the Antenatal Clinic visits and hospital births.

Table 2.4: Previous Pregnancies

Response	Intervention	Control
Unanswered	3(1.3%)	Nil
Yes	110(48.7%)	139 (61.5%)
No	113(50%)	87(38.5%)
Total	226(100%)	226 (100%)

4.6.2: Current Gestation Age

Intervention group: 52.2% (n=118) of the respondents were between 26-30 weeks (n=108) were at 31-34 weeks.

Control group; 39.8% (n=90) were between 26-30 weeks and 60.2% (n=136) of the respondents were between 31-34 weeks.

4.6.3: Antenatal clinic attendance for the current pregnancy

Intervention group; 53.5% (n=121) attended twice, (20.4%, n=46) were attending the clinic for the first time, 16.8% (n=38) had attended once, 8.4% (n=19) had attended three times and 0.9% (n=2) attended the clinic four or more times.

Control group; 56.2% (n=127) had attended the clinic two times, 10.2% (n= 23) were attending the clinic for the first time, 22.1% (n=50) had attended once, 10.6% (n=24) had attended three times and 0.9% (n=2) had attended the clinic four or more times.

4.6.4: Reasons for Failure to Attend ANC (n=69)

Intervention group members (n=46) who had never attended antenatal clinic and now were attending for the first time gave the following reasons as to why they had never attended; 32.2% (n=15) did not want. 23.9% (n=11) reported that the clinic was too far away. 21.7% (n=10) were not aware of the pregnancy. 6.5% (n=3) lacked information and 15.2% (n=7) were economically unable.

Those who had never attended any antenatal clinic in the control group and now were attending for the first time (n=23) gave the following reasons as to why not; 26.2% (n=6) did not want. 21.7% (n=5) of the total respondents said they were economically not able, aware of the pregnancy accounted for 13% (3) and only 4.3% (n=1) lacked information.

4.6.5: Number of children the respondents had before

Considering the number of children the respondents had before, the study results showed the following: intervention group; 44.2% (n=100) of the respondents did not have any child, 41.2% (n=93) of the respondents had one child and 14.6% (n=33) of the total respondents had ≥ 2 children.

The results in the control group were as follows: 44.7% (n=101) of the respondents had one child, 41.6% (n=94) of the respondents did not have any child, and lastly those respondents who had ≥ 2 children accounted for 13.7% (n=31) of the total respondents.

4.6.6: Place of previous births

Of all the respondents in the intervention group, n=126 had had previous births. The respondents were asked to state where their previous births took place. The results showed that 37.3% (n=47) took place at home followed by those who gave birth at the hospital at 21.4% (n=27), and 41.3% (n=52) did not give any answer.

In the control group, n=132 had had previous births. The respondents were asked to state the place of previous births. The results showed that 34.8% (n=46) took place at home followed by those who gave birth at the hospital at 34.1% (n=45), and 31.1% (n=41) did not give any answer.

Table 3.4: Birth preparedness

Items	Intervention-n=126		Control-n=132	
	No	Yes	No	Yes
Had birth companion	55 (43.7%)	71 (56%)	47 (35.6%)	85 (64.4%)
Had preferred place of birth	55(43.7%)	71(56.3%)	47 (35.6%)	85 (64.4%)
Had preferred mode of birth.	108 (85.7%)	18 (14.3%)	117 (88.6%)	15 (11.4%)
Organized means of transport	119 (94.4%)	7(5.6%)	128 (97%)	4 (3.0%)
Saved emergency finances	95 (75.4%)	31 (24.6%)	99 (75.0%)	33 (25.0%)
Engaged someone to care for the family	110 (87.3%)	16 (12.7%)	119 (90.2%)	13 (9.8%)
Bought a baby bag	66 (52.4%)	60 (47.6%)	72(54.5%)	60 (45.5%)

The respondents in the intervention group, who had had babies before, were analyzed for how they prepared for the birth of their previous babies. The results were as shown in table 3.4

Table 4.4: Services Received at the ANC

Groups	Intervention		Control	
	No	Yes	No	Yes
Blood testing	14	212	36	190
Urine testing	65	161	65	161
Nutrition counseling	136	90	152	74
Health education on danger signs	148	78	167	59
Immunization (Tetanus Toxoid)	32	194	61	165
Physical examination	13	213	15	211
PMTCT, HIV counseling and testing	17	209	17	209
Personal and neonatal hygiene,	190	36	166	60

Respondents were asked to state the services they received at the antenatal clinic and the results were as shown in table 4.4.

4.7: Part II: Intervention

4.7.1: Specific objective 4:

To find out how the “Evidence-based health education’ intervention influenced reduction in neonatal morbidity and mortality among respondents in the intervention group.

4.7.2: Theme 1: Perception towards the Intervention

The respondents were divided into groups of 20 members. Each group had a leader. Three sessions were conducted for each group. Not all members of a given group attended all the sessions at any given time due to various reasons especially the distance. However, those who attended had this to say:

Respondent 1: *“For my part, I was very happy with how we learned the discussion way that is, information sharing. I got to learn a lot from the sharing”.*

Respondent 2: *“At the beginning, I felt scared and afraid because I was feeling ashamed as the only smallest among them all. However, I gained a lot during the discussions. Whereas I did not directly contribute, I tried to answer the teacher’s question. I was also happy with the sharing from the members talking about their experiences and above all sharing among ourselves. We learned through group sharing, talking experiences and story-telling.*

The teacher taught us then asked questions and people answered and we could also talk among ourselves and teach each other”.

Respondent 3: *“I was so impressed with the pictures they used to teach us. Similarly, the role plays were very informative. To me this was very good because it helped me to understand myself*

Respondent 4: *“For me, I liked the sharing of those who had had children before. They talked about bad and good things in their families and communities, the challenges and problems and from them I learned a lot’. This does not happen in the clinic”.*

4.7.3: Theme 2: Lessons learned

Most mothers had similar sentiments about health education as outlined herein;

Respondent 5: *“This health education was different from that done in the usual clinic where they don’t teach but just ask if one knows what to do. How does one know? But here, in these discussions; I have learned the importance of attending the antenatal clinic during pregnancy and also taking the baby to the clinic as soon as the baby is born”.*

Respondent 6: *“In these classes, I have learned how to clean my private parts and wear light panties to reduce the sweating in these areas as well as germs living there”.*

Respondent 7: *“Me, I have now known how to clean the baby and especially the cord*

which I used to fear so much until I could just let my mum or my mother in-law do it. I will not fear anymore because other mothers shared that they are doing it themselves without fearing. I was encouraged, after birth to practice exclusive breastfeeding for six months without giving any other foods and keeping the baby warm. Now I will not leave these tasks to my mother or my mother in-law. And now all of us should try and use what is being taught and shared here and especially the experiences shared by those who already have children”.

Respondent 8: *“I have been wondering but today I have learned how I can detect danger signs in the neonate and what to do. In the clinic, the sister just said, you know these things, no need to repeat and that was all. But now I can tell. For example, when the neonate has temperature, I will undress and cover her with light cloth, then take her to the doctor quickly but not to give traditional herbs. Alternatively, I can wipe her with a piece of cloth dipped in warm water to cool the body first and then take to hospital but not to start with herbs like what people say that some diseases are traditional and therefore if the baby is taken to hospital and gets injected, he will die”.*

Respondent 9: *“I did not know but now I have learned how to detect neonatal bad signs and what I can do” for example when the baby cries endlessly and is restless I can check the whole body for any wound or swelling and then take to the doctor quickly for examination and treatment”.*

Respondent 10: *“What has amused me is the fact that a pregnant woman can do exercises and that these exercises can help during child birth. I have been seeing mothers with big stomachs and wondering, so they need to do exercises”*

Respondent 11: *“Most of the times at the clinic, the nurse usually talked about the importance of a balanced diet, that is; a pregnant woman needs to eat liver, fruits and sweet things that will help the baby to grow. But then where does one get the money to buy all these? But now, I am beginning to understand that the ordinary food that we eat is all we need on condition that it not one type. The food must have all vitamins”.*

Respondent 12: *“We have all been encouraged to attend the clinics before for ourselves and after delivery for the babies. We have also learned the benefits of exclusive breastfeeding”*

4.7.4: Theme3: Suitability of the Intervention

Would you like this method reverted and why?

There was a one-chorus answer:

“Nooo!!!!!!!!!!!, let it continue because it is better when we talk among ourselves than when we are among the other mothers because they do not even understand us”.

Table 5.4: Regression Analysis

(for mode of teaching and)

Variables	intervention		Control		p>
	F	%	F	%	
Mode for teaching					0.000
Small Peer Group	220	97.3	176	78.9	
One-on-one	6	2.7	50	22.1	

There was a significant association between the mode of teaching and neonatal morbidity and mortality ($p < 0.000$) as reported in table 5.4.

4.8: Part 3: Follow up and Evaluation

Specific objective 5: Compare the neonatal morbidity and mortality among the intervention and control groups

4.8.1: Congenital abnormalities

Concerning congenital abnormalities in the intervention group, the study results showed the following: 97.8% (n=221) of the respondents reported no abnormalities while 2.2% (n=5) agreed that there were abnormalities.

In the control group, the study results showed that 99.1% (n=224) of the respondents said that there were no congenital abnormalities while 0.9% (n=2) agreed that there were abnormalities.

Of the seven neonates who were malformed, 2 died, 1 was abandoned, 1 was chased away with the mother while the fate of the remaining 3 was not reported.

Table 6.4: Neonatal Illness

Ill neonate	Intervention	Control
Yes	70 (31%)	65 (28.8%)
No	156 (69%)	161 (71.2%)
Total	226 (100%)	226 (100%)

On neonatal illness, the study results were as indicated in table 6.4.

4.8.2: Number of Times the Neonates Fell Ill during the Four (4) Weeks

Consequently, the respondents who had ill neonates within the four weeks reported the following; 90% (n=63) of the 70 respondents in the intervention group said neonates fell ill at least 1 or 2 times and 10% (n=7) of the respondents said that the neonates fell ill between 3 and 5 times. Of the 65 respondents in the control group whose

neonates fell ill in the four weeks, 95.4% (n=62) fell ill 1 or 2 times and 4.6% (n=3) fell ill between 3-5 times.

4.8.3: Neonate Treatment

The results in the intervention group showed that of the n=70 neonates who fell ill, 80% (n=56) of the respondents took them to the hospital. 24.3% (n=10) of the respondents traditionally treated the neonate at home with herbs. 5.7% (n=4) of the respondents treated the neonate at home with medications bought from the chemist (over-the-counter drugs).

The results in the control group showed that after the neonate fell ill, 7.7% (n=5) of the n=65 respondents took them to the hospital, 83% (n=54) of the respondents traditionally treated the neonate at home with herbs and 9.2% (n=6) of the respondents treated the neonate at home with medications bought from the chemist (O-T-C drugs). Here there was a very big discrepancy where the results were opposite of the other intervention – 80% went to hospital vis-à-vis control- 7.7% who took the neonates to hospital. This could be explained by the health education given during pregnancy and follow up of the mothers after discharge from the facilities both on phone and physically by the Community Health Volunteers (CHVs). However, the efforts of the respondents to have the neonates treated were commendable.

4.8.4: Possible causes of neonatal illness

Most, 90.7% (n=205) of the respondents in the intervention group attributed illness to witchcraft, negligence; 89.4% (n=202), bad eye; 88.9 (n=201) and neonatal disease; 11.1% (n=25).

In the control group, most of the respondents attributed the neonatal illness to witchcraft, 94.7% (n=214), negligence at 92% (n=208), bad eye 83.6% (n=189) and disease at 11.9% (n=27). Conclusively for these results, every neonatal illness had a cause.

4.8.5: Knowledge of Previous Neonatal Deaths

The results in the intervention group, showed that most, 84.5% (n=191) of the respondents had no knowledge of neonatal deaths while 14.2% (n=32) knew of some neonatal deaths. The results in the control group showed that most, 81% (n=183) of the respondents had no knowledge of neonatal deaths while 18% (n=43) had knowledge.

Table 7.4: Neonatal complications

Variables	Intervention		Control		p-value
	n	%	n	%	
Pregnancy complications					
Yes	1	6.6	6	28.8	0.082
No	21	93.4	161	71.2	
Neonatal complications					
Yes	2	9.3	5	24.3	0.067
No	20	90.7	171	75.7	

Table 7.4 depicts the possible neonatal complications experienced and their significance

4.8.6: Current Neonatal Deaths

The respondents in the intervention group who agreed that they had neonatal deaths accounted for 11.9% (n=27). The respondents who agreed that they had neonatal deaths in the control group accounted for 18.6% (n=42) of the total respondents.

It is evident that fewer respondents in the intervention group lost their neonates as compared to the respondents who lost their neonates in the control group.

4.8.7: Current State of Neonate at 4 weeks

Respondents in the intervention group reported as follows: 84.1% (n=190) of the respondents said that their neonates were alive and well, 11.9% (n=27) were dead (died either at birth or a few days later mostly due prematurity and infections). 2.7% (n=6) were ill and on medication or admitted to hospital. 1.3% (n=3) did not give any information concerning the state of their neonates.

Respondents in the control group were also asked to give the state of their neonates at 4weeks post birth. 82.1% (n=181) said that their neonates were alive and well, 18.6% (n=42) had died due to various causes, 0.4% (n=1) was ill at home and 0.9% (n=2) did not say where their neonates were.

From these results, it is also evident that neonatal death is still a concern. However, it is noted that the fewer neonatal deaths in the intervention group could be associated with the

health education intervention the mothers received during pregnancy, the antenatal visits and follow up.

Table 8.4: Paired Sample Statistics (T- test) Intervention group

Deaths		Mean	N=	Std. Deviation
Pair	Intervention	1.22	226	.631
1	Control	1.48	226	.671

Table 8.4 indicates that the mean for the intervention group on the state of the neonate at four weeks was 1.22 and that of the control was 1.48. The standard deviation for the intervention group was 0.631 and for the control group, 0.671. The number of participants in each condition (n) was 226.

Table 9.4: Paired Samples T-test: State of neonate at 4weeks

air 1	Mean	Std. Deviation	Sig. (2-tailed)
Intervention /control	.152	1.044	.031

Table 9.4 presents results of the paired samples t-test. The Significant (2-

Tailed) is 0.031 which is less than 0.05 hence study concluded that there was a statistically significant difference between intervention group and control group on the state of the neonate at four weeks. This implies that differences between the intervention group and control group were likely due to the Evidence-based Teenage Health Education intervention carried out. Since Paired Sample Statistic results revealed that the mean number of the intervention group

was different from that of the control group by (0.16). The study therefore concluded that participants in intervention group had a significant difference on state of neonate after the intervention as compared to the control group. This can be simplified as the intervention group having more living neonates than the control group.

4.8.8: Age at Neonatal Death

Out of the 27 neonates who died in the intervention group, 44.4% (n= 12) died at the age of between 1-5days, followed by those who died between 6-10 days at 29.6% (n=8), between 11-15 days at 18.6% (n=5), those who died between 16-20 days accounted for 3.7%. (n=1) and those ≥ 21 days at 3.7 % (n=1).

Out of the 42 neonates who died in the control group; 38.1% (n= 16) died within 5days of birth, followed by those who died in 6-10days of birth at 40.5% (n=17), between 11-15 days 7.1% (n=3), those who died between 16-20 days 11.9%. (n=5) and those who died ≥ 21 days of life 2.4% (n=1).

4.8.9: Place of Neonatal Deaths

For the respondents who lost their neonates in the intervention group, the results were as follows: 37.1% (n= 10) did not answer, 40.7% (n= 11) of the respondents reported that the deaths took place at home and 22.2% (n=6) stated that the deaths occurred in the health facility.

For the respondents who lost their neonates in the control group, the results were:

21.4% (n= 9) did not answer, 47.6% (n= 20) of the respondents stated that the death took place at home and 31% (n=13) stated that it took place in the health facility.

4.8.10: Possible causes of the neonatal deaths

Results from the respondents in the intervention group showed that the majority of the respondents, 95.6% (n=216) reported that negligence and witchcraft, 95.6% (n=216) were the main causes of neonate deaths. Other respondents, 94.2% (n=213) felt that prematurity and disease, 93.8% (n=212) were also blamed on neonatal deaths. In the control group, 88.5% (n=200) and 82.7% (n=187) of the respondents reported that prematurity and negligence were the main causes of neonatal deaths respectively. Disease, 60.6% (N=137) and witchcraft, 52.7% (n=119).

Table 10.4: Chi square analysis

Dead neonates	Possible cause of death	Other causes of death	Total deaths	Significance
Witchcraft	8	19	27	$\chi^2=46.064$, df=1, Sig.=0.000
Delays	16	11		$\chi^2=.451$, df=1, Sig.=0.502
Disease/infections	10	17	27	$\chi^2=50.196$, df=1, Sig.=0.000
Prematurity	12	15	27	$\chi^2=84.676$, df=1, Sig.=0.000
Negligence	9	18	27	$\chi^2=60.595$, df=1, Sig.=0.000

Witchcraft: The study results in table 10.4 reported that there was a significant relationship between the state of life and witchcraft as a cause of death since the sig=0.000 which is less than 0.05. This also reveals that although the total number of

neonatal deaths was 27 in the intervention group, 19 of them could have been due to other causes and not directly witchcraft unlike the 8 which probably were possibly caused by witchcraft.

Disease/infections: The study results in table 56 reported that there was a significant relationship between state of life and Disease/infection as a cause of death with significance 0.000 that is less than 0.05. The results also explain the fact that although the total number of neonatal deaths was 27 in the intervention group, 17 of them are likely to have been caused by other factors other than disease and infections but it is likely that the 10 deaths were possibly caused by disease and infections.

Prematurity: The study results in table 57 indicated that there was a significant relationship between state of live and prematurity as a cause of death with significance 0.000 that is less than 0.05. The results further indicate that although the total number of neonatal deaths was 27 in the intervention group, 15 of them are likely to have been caused by other factors other than prematurity but it is likely that the 12 deaths were possibly caused by prematurity.

Negligence: The study results in table 57 reported that there was a significant relationship between state of live and negligence as a cause of death with $P < 0.000$ that is less than 0.05. The results further indicate the total number of deaths in the intervention group was

27 out of which 18 are likely to have been caused by other factors other than negligence and that it is likely that 9 deaths were possibly caused by negligence.

Delays: The study results in table 57 reported that there was no significant relationship between the state of live and delays in seeking medical assistance as a cause of death with significance 0.502 that is more than 0.05 ($p > 0.05$).

Table 11.4: Cross Tabulation (Intervention)

Intervention group	Died				Total
	Possible Cause of death	Extreme prematurity	Gross congenital malformation	Neonatal Infection	
Neonates who died	3	1	12	11	27
Percentage	11.2%	3.7%	44.4%	40.7%	100.0%

When cross-tabulation was done, infections emerged the leading possible causes of neonatal deaths (44.4%, $n=12$) of the 27 neonates who died in the intervention group followed by prematurity, 40.7% ($n=11$).

Table 12.4: Cross Tabulation (Control)

Control group	Died				Total
	Possible Cause of death	Extreme prematurity	Gross congenital malformation	Neonatal Infection	
Neonates who died	5	-	25	12	42
Percentage	11.9%	-	59.5%	28.6%	100.0%

When cross-tabulation was done to the neonates in the control group, infections again emerged the leading possible causes of neonatal deaths (59.5%, $n=25$) of the 42 neonates who

died in the control group followed closely by prematurity, 28.6% (n=12). Extreme prematurity, 11.9% (n=5) followed closely.

4.8.11: Avoidable Death

When the respondents in the intervention group were asked if the deaths could be avoided, most of them, 86.7% (n=196) did not know, 7.5% (n=17) said yes, the deaths unavoidable deaths was that once the witchcraft has been performed, it is not possible to reverse it whatsoever.

When the respondents in the control group were asked if the deaths were avoidable, the results were as follows: 84.5% (n=191) did not know, 11.5% (n=26) said yes it was possible to avoid the deaths, 4% (n=9) said the deaths could not be avoided. The reason for unavoidable deaths was as given by the respondents in the intervention group.

Table 13.4: Logistic regression of neonatal deaths and risk factors Logistic (multivariate analysis)

Variables	Odds ratio	p-value	95% Confidence Interval	
			Lower	Upper
Prematurity	0.326	0.022	0.126	0.848
Delay in seeking services	0.252	0.023	0.077	0.829
Hospital accessibility	0.115	0.040	0.015	0.902
Negligence	0.314	0.017	0.122	0.810

At the multivariate level after the intervention, death was less likely to occur to term neonates as compared to those who were born prematurely, (Exp (B)=0.326, 95%CI [0.126-0.848], $p \leq 0.022$).

At the multivariate level after the intervention, death was less likely to occur to neonates whose mothers sought health care services on time during delivery as compared to those who had a delay (Exp(B)= 0.252, 95%CI [0.077-0.829], $p < 0.023$).

At the multivariate level after intervention, death was less likely to occur to neonates whose mothers had accessibility to the hospital during delivery as compared to those who were not accessible to the hospital (Exp(B)=0.115, 95%CI[0.015-0.902], $p < 0.040$).

At the multivariate level after the intervention, death was more likely to occur to neonates who had been neglected as compared to those who were not, (Exp (B) = 0.314, 95%CI [0.122-0.810], $p < 0.017$). Table 13.4

Table 14.4: Multivariate analysis for socio-demographic factors and NNMM

Variables	Odds ratio	p-value	95% Confidence Interval	
			Lower	Upper
Age	0.98	0.675	0.857	1.868
Marital status	0.25	0.263	0.789	1.829
residence	1.05	0.550	0.745	0.922
Educational level	0.31	0.567	0.926	1.110
occupation	1.26	0.030	1.22	1.421

Table 14.4 highlights the multivariate analysis as reported with occupation standing out significantly.

4.8.12: Ways to reduce neonatal mortality

Respondents in the intervention group suggested ways to reduce neonatal morbidity and mortality among neonates born to teenage mothers; n=131 of the respondents were of the opinion that health education to parents of the teenagers was the most appropriate way of reducing neonatal deaths, community awareness and education on neonatal care, n=121 was equally important. Then periodical follow up during the neonatal period was suggested by n=111 respondents, discouraging teen pregnancies had n=107 respondents, encouraging male partner involvement was suggested by n=96 respondents, emphasizing parental involvement in neonatal care had n=95 respondents supporting, introducing teenage maternal health initiatives was suggested by n=39 respondents respectively.

Respondents in the control group were also asked to suggest ways to reduce neonatal mortality among neonates born to teenage mothers, the results reported the following, n=166 suggested periodical follow up during the neonatal period and similar to those who suggested male partner involvement, n=166. Other respondents, n=151 suggested the introduction of teenage maternal health initiatives, n=140 suggested community awareness and education on neonatal care, n=124 suggested health education to parents of the teenagers, n=122 suggested use of technology in neonatal emergencies in the health facilities, n=113 suggested parental involvement in neonatal care. Lastly, n=105 of the respondents suggested that teen pregnancy should be discouraged.

Table 15.4: Role of health care provider

Intervention	YES	NO
Antenatal services were sufficient	210	16
Healthcare providers were efficient	184	42
Birth process was well managed	134	92
Neonatal morbidity and mortality has improved	132	94

Of the total respondents, n=210 agreed that antenatal services were sufficient, while n=16 disagreed that the antenatal services were sufficient. N=180 agreed that healthcare providers carried out their work well; n=42 disagreed. N=134 agreed that the birth process was well managed, but n=92 disagreed. N=132 agreed that neonatal morbidity and mortality has improved. Table 15.4

Of the total respondents in the control group, n= 162 agreed that antenatal services were sufficient, n=74 disagreed that the antenatal services were sufficient, n=125 agreed and n=102 disagreed that healthcare providers carried out their work well; n=89 agreed while n=137 disagreed that the birth process was well managed. n=140 agreed while n=86 disagreed that neonatal morbidity and mortality had improved,

4.8.13: Rating of the ‘Evidence- Based Health Education’ intervention

The respondents in the intervention group were asked to rate the ‘evidence based health education’ intervention and the results were; 41.6% (n=94) of the respondents

rated 'very good' followed by those who rated 'good' at 41.2% (n=93), 16.4% (n=37) said it was 'average' and 0.9% (n=2) said it was 'poor'.

4.8.14: Comment on the overall intervention process

Overall comment of intervention process; 40.3% (n=90) of the respondents were of the opinion that the intervention was informative, 29.6% (n=67) very informative, 27.4% (n=62) that it needed improvement and 2.7% (n=6) said that it was not informative.

Intervention Evaluation: most of the respondents positively evaluated the intervention strategy with n=190 respondents having completed the sessions, n=200 of the respondents found the intervention beneficial, n=220 of the respondents would apply the same information in subsequent pregnancies, n=177 of the respondents felt that the intervention had helped reduce the neonatal morbidity and mortality. However, the utilization of the information gathered was with some challenges with only 54.9% (n=124) managing to utilize it as compared to 45.1% (n=102) who did not utilize it.

Intervention grading by the respondents:

When the respondents were asked to grade the intervention on a scale of 0-10 points, 92% (n=208) graded the intervention above average between 6 to 10 points.

Table 16.4: Midwives' Interview

Question	Yes	No
Aware of the intervention	6	0
Participated in the intervention	4	1
ANC attendance for the respondents in the intervention group improved	5	1
The incidence of NM in the intervention group	4	1
The intervention was effective	5	0
The uptake of MCH, postnatal and FP in the intervention group improved	5	1
Would you suggest this approach to antenatal care?	6	0
Would you advise the hospital to adopt this approach?	5	0

From the analysis in table 16.4, more than 60% of the midwives agreed with most of the statements with regard to reduction of neonatal mortality.

Table 17.4: Comparisons between the Intervention and Control Group

Group	Intervention	Control
Response rate	96%	89%
4 ANC completed visits	2	2
Facility/home births	167/30	94/42
Birth at TBA'S place	28	90
Neonatal deaths	27 (11.9%)	42 (18.6%)
Proportion of change	31 (13.7%)	16 (7.1%)
Neonatal survival rate	199 (88.1%)	184 (81.4%)
Immunizations	106 (46.9%)	141 (62.4%)
Postnatal check up	102 (45%)	33(14.6%)
Impact of the intervention	Positive	-

Findings in the intervention group showed marked improvements in most aspects except in response to antenatal clinic attendance. This was far much below the World Health Organization recommended guidelines of at least four focused antenatal visits for all expectant mothers. The discrepancy in immunization uptake was subject to the availability of the vaccines at the time the baby was brought to the clinic. Table 17.4

CHAPTER 5: DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1: Introduction

This chapter focused on three sections; discussions, conclusions and recommendations of the findings in this study.

5.2: Discussion

In this section, I discussed the findings of this study as compared with those of other similar or related findings by other researchers of the similar field of interest and mindset.

5.2.1: Part 1: Baseline results

The desktop baseline assessment of the hospital records for the year 2017 revealed that most teenage mothers (58.5%) gave birth at home. Of these, birth complications accounted for 26.4% and neonatal deaths accounted for 58.3%. Only nine-point nine percent (9.9%) of all the files of teenage mothers in 2017 attended postnatal clinic. These findings concurred with the findings by Jain et al (2014) who reported home births by teenage mothers coupled with neonatal infections. The reasons for this low facility uptake of birth services could have been probably attributed to fear, humiliation and stigma or lack of knowledge as well as lack of support. The immunizations (BCG and Birth polio) uptake in the neonatal files accounted for 67.5%. The rest of the files with missing immunizations were recorded as being out of stock.

The records in the files revealed that, of the neonates who were admitted from home, most of them were diagnosed with neonatal malnutrition and neonatal sepsis. This finding was

in line with the reports in a study by Hibstu, et al (2014) who reported neonatal sepsis and malnutrition as the key determinants of neonatal deaths. According to the patients' clinical notes, malnutrition was due lack or poor breastfeeding habits or the complementary feeds on which the neonates were fed, particularly prepared by the grandmothers. Some recovered and were discharged home while others succumbed. These findings were in line with what had been shared during the sessions; ***'my grandmother was giving him maize meal dipped in soup or maize porridge'***. Other neonates were diagnosed with neonatal sepsis. This was attributed to poor hygienic conditions at birth, lack of knowledge in neonatal hygiene and poverty; ***'I did not have money to buy diapers, so I tore old clothes into pieces and napped him with that'. I feared cleaning the cord so I just left it like that'***. Some respondents shared. These findings are supported by Reid (2017) in her extensive retrospective study on infant mixed feeding, health and survival, she concluded that mixed feeding influenced neonatal mortality.

Further to this, the study found out that, child- bearing in Busia started as early as at 12years and reached a climax at age 18. Most pregnancies (97.8%) occurred between 16 and 19 years. This finding contrasts the findings in a study carried out in Nairobi by Beguy et al (2013) in which they found that only 34% of the teenage mothers became mothers by the age of 18 years. However, the mean age of the respondents in Busia County was 17.8 years, the median was 18.23 years and the mode was 19.01 years respectfully. This finding contrasts the findings in study carried out by Izugbara (2018) that reported 20.3 years as the median age in

2014 in Kenya. The reasons for the Busia study findings were varied to include but not limited to early sexual exposure resulting from exchange of money for sex by the long track drivers across the Kenya – Uganda border and the motorcycle and bicycle riders (popularly known as ‘Boda boda’). The Boda bodas usually ferried the young girls to and from school and as such, took advantage over them, *‘sometimes he carried me free and other times he gave me money for lunch’*; one of the respondents explained. The young girls were also actively involved in hawking as well as transporting goods for traders across the border at a fee. The male traders and track drivers abused the teenage girls sexually and turned some into concubines. In this state, the teenage mothers were convinced that they were married. The respondents later realized that they were pregnant and that the responsible men were at large. At this tender age, they could not make any decisions. They developed fear and resentment instead. Some ran away from their parents while others attempted criminal abortions. This finding is supported by a study by Osok (2018) who reported that pregnant teenagers encountered challenges such as fear, restricted education, lack of basic needs and denial of the pregnancy by the responsible men.

Some parents negotiated for their pregnant daughters’ early marriages, *‘I was forcefully married off to that old man by my father. My father did not want to see me in his home’*. Some teenage girls got pregnant from their peers in school while others were lured into sex by older men who bought them snacks and even offered alcohol and hard drugs to

some. This finding concurs with the findings of Baastsen, Timor-Leste and Lano (2018), whose evidence revealed that expectant teenage mothers aged 15-19 years or even below were forced into marriage by their fathers and guardians.

As a result of the pregnancies, most respondents dropped out of school before attaining full secondary level of education, 84.1% from the intervention group and 81% in the control group. The reasons for dropping out of school included but not limited to; being pregnant, fear of being punished by parents, stigmatization and rejection, humiliation from peers, teachers and generally just developing negative attitude towards school. This finding compares with results of a study carried out in Zambezi Region, Namibia, by Maemeko et al (2018) which reported expectant teenagers' negative attitude towards education and subsequent dropout of school. The reasons were cited as shame, rejection and failure to cope with insults by school mates and teachers. However, some respondents gave their reasons as lack of school fees while others said, they had never been to school. This finding concurred with that reported by Atuyambe et al (2015) where teenage girls expressed challenges that included; inhuman treatment, stigma, forced marriages, rude health workers and poor relations among others. Further still, some respondents declined to give their reasons citing mistreatment. At a mean age of 17.8, most of the respondents in Busia County had a subsequent pregnancy. This finding agrees with a study by Marteleto and Dondero (2014) in Brazil, who found out that the

maternal age of the respondents at first child birth lay between 15 and 17 years and that by age 18, they were likely to have subsequent pregnancies.

In this study, most respondents, 90.7% had gone to school up to secondary level. However, most of them dropped out at Form One and at most Form Two first term. They cited lack of school fees, harsh parents especially when they became pregnant, the negative attitude from the teachers and other students, the peer influence and the fact that their bargaining power was reduced following pregnancy. As such, they could not defend themselves or take decisions over their lives. This finding relates to a study by Mangeli, et al (2017) in which the teenage mothers complained about the head teachers at their schools who literally could chase away expectant teenagers from school and explain to the rest of the students how bad it was for anyone to be in school with a 'big stomach'. The study also gave a list of psychological, emotional and physical difficulties that contributed to the teenagers' dropping out of school. Similarly, this study echoed the findings from a study by Maithy and Saxena, (2018), who argued that most teenage girls dropped out of school due to financial difficulties or that their families did not support the idea of pregnant girls' education. But, at the same time, some girls became disinterested in school once they realized they were expectant.

Additionally, after dropping out of school, 73% of the respondents got married either by choice or by force. The parents, especially the fathers would not entertain a pregnant daughter in the home and therefore had them married off. For this matter, the respondents

had no choice but to comply. This finding is comparable to the UNFPA report, 'Motherhood in Childhood: The Challenges of Teenage Pregnancy (2013), which indicated that the girls in forced marriages had little or no say regarding their situation. A few parents especially the teenage mothers attempted to return the teenagers to school after birth but the girls faced challenges of motherhood and student life, stigma and unacceptability. Therefore, they still dropped out anyway. The respondents later devalued the education. This finding was supported by the finding in a study in Accra, Ghana by Gyesaw and Ankomah (2013) which reported that reactions from fathers were intense and difficult for the teenage mothers to handle than from the mothers. Fathers felt deeply troubled, hurt and very moody, taking actions on impulse while the mothers could get upset but later relax and be sympathetic.

For the respondents who claimed to be married, (73%) of them in the intervention group were just kept by the truck drivers and the boda boda men who only held them hostage by telling them that they were wives. The respondents continued serving them sexually. They lived in this lie until they were mothers of more than one child, either from the same men or different men who kept cheating them. Most times, the girls did not remember the previous man. They went with the current man thinking he was the previous one. This confusion led to what was popularly referred to as '*babies of track drivers*' in Busia town. Some of these babies have also grown into teenage girls and have continued the game.

The respondents who reported to be single, (29%), was by default because according to Busia culture, all pregnant mothers were expected to be in their marital homes. An teenage getting a baby while still in the hands of her parents was not acceptable. Therefore, the girl was considered as second-hand material worthy being married off to any man who owned up for a wife. This was contrary to a study carried out in Zambia (author not known), where the intervention was to prevent early marriage and cases of teenage pregnancy and to support the nursing teenage mothers.

Most respondents (51.3%) resided in the rural settings but attended the antenatal clinics at the Busia County Referral Hospital. This was probably because the hospital offered fairly comprehensive services unlike the County and Sub-county health facilities that lacked most of the basic facilities and resources. It was also evident that the smaller facilities referred most of the expectant teenage mothers to BCRH as reported in this study. This finding was supported by Yurdakul, M (2018) who noted that the place of residence and the health facilities available had a great impact on antenatal care of the teenage mothers.

The study results showed that the respondents did not have a specific place and people to live with. It was noted that they lived everywhere with anyone who probably could accommodate them. The scenario is such that a few of them lived either with parents or spouses or alone or with any person to include grandmothers, aunties, friends, grandfathers, uncles or siblings. The reason for this was the fact that the respondents were not readily

accepted in the families and therefore went away in search of comfort. Others were chased away by their parents. These findings compare with the arguments of Shaw, (2014) who in her study explained the important role the family plays in the life span for the teenage mother by providing a supportive environment and especially during the transition to motherhood. In the absence of this, the teenage mother felt confused and lost.

Compounded with this, was the lack of formal employment, where the respondents were largely unemployed accounting for 95.6%. This situation put them at risk of doing anything to earn money for sustainability. The respondents were seen on the streets hawking or at doors of the bars and lodgings or besides the track windows probably venturing into commercial sex. Their income was less than Ksh. 5000/- per month as found out in this study. Other respondents mostly depended on their parents, spouses and guardians where it was also noted in this study that their income was inadequate or not there at all. Most of the respondents, 89.4% did not even know the income of those people they lived with. Even those who earned more than Ksh 5000/- per month did not maintain the teenager's upkeep. This finding was in line with the finding in a study carried by Smith and Wilson (2014) in the US, which concluded that most expectant and nursing teenage mothers were unemployed and mostly depended on parental support particularly in the country side.

As much as the study reported a large number of the respondents being Christians, (86.6%), the Christian values seemed not to have been followed or practised in the wake of

increased teenage births. This result contradicted the findings of Smith (2014) who found out that Christianity or religiosity in adolescence only served to postpone sexual activity and as such teenagers from religious families were less likely to engage in premarital sex.

Specific objective 1: *Identify the risk factors for neonatal mortality among neonates born to teenage mothers in the intervention group compared to the control group.*

This study reported that, of great concern were predisposing factors related to the neonate; Low birth weight which accounted for 72.2%, prematurity which accounted for 67.3%, multiple births accounted for 66.4%, neonatal infections which accounted for 64.2%, birth complications/trauma accounting for 55.1% and congenital malformations accounted for 38.5% of all the respondents. These findings were supported by several studies to include but not limited to Pandya, et al (2018), Gujarat and Ravikumar, et al (2018) in Tamil Nadu – India, all reported prematurity as one of the leading causes of neonatal mortality. Birju & James (2014) researched on neonatal sepsis and concluded that it was a major cause of neonatal deaths. Rhoda, et al (2018) in their study in South Africa also found out that prematurity and Low birth weight were the drivers of neonatal deaths in the country, with those born weighing <1000 grams (ELBW) contributing significantly to the mortality figures.

This study further reported maternal predisposing factors as follows; non -breast feeding which accounted for 80.1% with only 13.7% of the respondents having been counseled on breastfeeding. This finding concurred with the findings of a study in Indonesia

by Sutan and Berkat (2014) which reported ‘not practicing exclusive breastfeeding’ (OR5.58, 95% CI) as a major predictor of neonatal morbidity and mortality. Lack of knowledge of neonatal danger signs, poor neonatal management (For example this study found out that as few as 1.8% of the respondents reported that their neonates were examined physically and that the congenital malformations the neonate had were discovered by the teenager’s grandmother at home after discharge from the hospital). Similarly, only 11.1 % of the respondents reported to have been taught how to care for the neonate. These findings agreed with findings by Abdullah, et al (2016) who in their study concluded that maternal lack of knowledge of neonatal danger signs, poor or lack of response to neonatal health problems and home births were the major causes of neonatal deaths in Indonesia. They further reported that most neonates succumbed to death simply because of lack of proper management either at home or at the health facility. In a study by Bulto, et al (2019), it was reported that only 20.3% of the respondents had information about neonatal danger signs and that respondents reported having received minimal counseling on other neonatal issues.

Further still, this study reported following enabling factors as major contributors to neonatal deaths; delays to seek medical help or reach the facility accounted for 67%. Various reasons were implicated in the delay; lack of finances, long distances that would be as far as 15km away from the nearest health facility, poor accessibility to the facility due to poor infrastructure, traditional beliefs and practices where it was believed that contemporary

medicines are not suitable for the neonate. Lack of knowledge to realize the seriousness of the neonatal condition and the need for urgent treatment was a factor that could not be ignored. Other factors included low socioeconomic status that indirectly contributed 52% and poor support system-58.2%, poor hygienic conditions-67.9%, unemployment and poverty indirectly accounted for 25.2%. This finding was supported by an article by WHO (2015); Newborn Death and Illness, where maternal health was linked to neonatal deaths and the fact that almost 99% of the neonatal deaths occurred in low-income countries.

At facility level, this study reported the following enabling factors; inaccessible health facilities accounted for 79.6%, negligence accounted for 85%, poor infrastructure accounted for 45.1%, lack of technological resources and insufficient staff to handle emergencies were reported as major setbacks. In this regard, this study noted that there were very few neonatal services available (51.3% of the respondents reported that there were no neonatal services) available in the local health facilities and as such all neonates were referred to Busia County Referral Hospital and subsequently to Moi Teaching and Referral Hospital for treatment in complicated or emergency cases. Some mothers took up the referral letters and went home and not to the hospital. Others resorted to traditional herbs and /or the ‘Over-The-Counter-Drugs’. However, there were routine services for other clients such as antenatal care-36.7 %, (though minimal), immunizations-61.5% (with hitches of shortages of vaccines). These findings were

supported by findings reported in studies by Akella & Jordan (2011) who reported that most health facilities encountered shortages of vaccines and family planning commodities.

At community level, the study reported the following reinforcing factors; lack of support from the community members to the expectant and nursing teenage mothers as reported by 83.6% of the respondents. Stigma and rejection of the teenage mothers as reported by 87.2% of the respondents stood out. Poor recognition of the ill or deceased neonates as reported by 56.6% of the respondents and which was associated with low levels of education played an important role. Cultural beliefs and traditions were reported by 44.7%, the fact that the community did not value neonatal health was recited by 69.0% of the respondents. Preference to traditional birth attendants took toll at 82.3% while lack of proper case reporting and correct records keeping of the ill or deceased neonates from the respondents was recorded at 78.8%. This finding agreed with W.H.O (2015), where it was reported that most neonatal deaths went unrecorded and therefore remained invisible leading to incorrect statistics.

Interestingly, most teenage mothers, (93.8%), in this study, breast fed their neonates though not exclusively. However, they supplemented with other feeds such as cow's milk, porridge and any food stuff that could be made into a paste or liquid. This happened especially when the respondents either went back to school or went to work as casual labourers or when the babies were abandoned. These findings are in line with the conclusions in a study in India carried out by Mari, et al. (2015) in which it was reported that the risk of mortality in 0–

5months old infants was predominantly higher among the non-breastfed (RR 8.66) infants compared to the exclusively breastfed infants. To further support this finding, Dr.Nigel Rollings, (WHO, 2016), in his article published in the Lancet series, 2016, argued that for breastfeeding to succeed, there was need for combined efforts from the mother, the family, the society, contusive environment, the community and government policies that support neonatal and infant health.

Distance to the nearest health facility was an issue in this study since 51.3% of the respondents had to travel more than 6 km. However, this appeared to be fair distances compared to 88.1km distance to the nearest health facility as reported in a study in India by Bokade and Meshram (2018). Additionally, this study revealed that there were no programmes or projects supporting neonatal health in Busia County currently. Ninety-eight-point two percent (98.2%) of the respondents agreed that there were no such programmes or projects. This finding concurred with a statement by W.H.O (2015) that there was lack of continuity between maternal and child health programmes and as such, the neonates missed the appropriate care. Never the less, the local health facilities provided minor services.

Specific objective 2: Determine the family social support system for the teenage mothers.

With regard to the family and social support system, this study reported that most of the respondents received some sort of support. However, the teenage mothers still faced several challenges due to lack of sufficient support as only about 30% reported that their

families were supportive. Contrary to this finding are the findings in a study in Mersin by Yurdkul (2018) that reported the respondents having received adequate support from their mothers, family members and spouses.

The peer support system was no better with 65.9% of the respondents describing it as very bad. The respondents further said that their peers were the ones who usually introduced them to men and into sexual behavior and later abandoned them once they became pregnant. It was also noted that the very young mothers of age 14 years and below conceived from older men (mostly the motorcycle riders and the cyclists who took them to school daily) but cheated them with little money or snacks. This finding compares with the findings in a study by Watts et al (2015) that emphasized the importance of a good family–social support system to foster better life for teenage mothers. Most of these respondents never got to know the consequences of sexual contact until when they conceived. Some pregnancies were of incest and therefore, culturally they were either terminated or the neonates were given out or both the young mother and her neonate were excluded from the nuclear family. Contrary to this finding, Akella et al (2016) in their study reported a different scenario where the government, teachers, peers, friends and parents worked together to support the respondents in all aspects including taking care of the neonate so that she could resume her studies.

This study reported that after childbirth and subsequent discharge from the health facility, most respondents, 77%, preferred going back to their own houses (their houses here

meant both where they stayed as single or staying with a partner). Others, 28.2% preferred their mothers' houses since it was the better option anyway, 14.2% preferred going to stay with their grandmothers for protection, 23.5% of the respondents went to stay with anybody who could accept them. Additionally, in this study, once the respondents were discharged from the health facility after child birth, the distribution of where they went appeared amorphous with almost everyone going everywhere. The reasons for this type of movement were blamed on the weak social support system. To support this finding, Tamara et al (2014) in their study argued that a good social support system played a vital role in molding the respondents in the self-care and eventual neonatal care.

When it came to the care of the neonates, this study found out that most teenage mothers, (85.4%) left their neonates under the care of their own grandmothers. Others left the neonates with other extended families. The reasons were probably due to lack of knowledge, lack of skills, inability to cope with the demands of the neonate and lack of psychological support. This finding was also reported by Leech, et al (2014) where the teenage respondents maintained that if it were not for their grandmothers and aunties, life would have been impossible to manage when caring for their newborns.

The respondents in this study reiterated that apart from the health care providers (90.3%), other people gave very little attention to the ill neonates and worse still; nobody cared about the dead neonate. The neonate was treated like nothing had happened or when it

died in hospital; the family was likely to abandon the body there. In fact, people were not allowed to mourn a neonate as it was believed that mourning prevented another baby from being born. In the case where one twin died, it was kept extremely silent to protect the remaining twin. The teenage mother was closely monitored in case she shed tears over the living twin. Because of this negative attitude, even the respondents also attempted to or actually abandoned the dead neonates in the hospital beds.

Most of the male partners responsible for the pregnancies denied even after the babies were born. For this reason, the male partners did not accept any liability or offer any help. Parents chipped in to help to some extent but they were also guided by the traditions. This finding is supported by a study carried out in Kenya by Kumar et al (2017) which revealed that male partners of the respondents negligibly supported them.

Concerning neonatal feeding, only 26% of the respondents exclusively breast fed their neonates and this was because they were in their marital homes and under close supervision of the mothers-in-law. However, this percentage is lower compared to 36% of the neonates who did not breastfeed exclusively in 2014 worldwide as reported by the WHO, 2018. The rest of the mothers practised mixed feeding saying that it was not possible for the neonate to feed on breast milk alone and that the neonates would not grow as fast and that they would lack energy. This result agrees with the information outlined in an article by Suzinne (2019) on

neonatal feeding in African countries. The feeding comprised of breast feeding, supplemented with water-based pre-lacteal feeds given to the neonates.

The study reported that most of the neonatal care was carried out mostly by the grandmothers, (85.4%) and the teenage mothers, 76.3%, the possible reasons for these choices largely lay in the fact that they were accommodative and sympathetic especially for the teenage mothers who may have been rejected by their fathers. This finding was supported by Damali et al (2017) in their study that examined the grandmothers' capacities to care for the neonates and noted that grandmothers impacted positively in the teenagers' neonatal care period.

The community in this study was perceived as not caring when it came to issues of neonatal health. Most respondents, (87%) felt stigmatized and rejected in all aspects of life and therefore chose to an- alone- life. Other respondents, 83.6% felt that the family, the community and the social society did not support them and therefore there was poor recognition of the ill neonate as well as the neonatal deaths. These findings agree with the findings by Kumar et al, (2018) and Neal et al (2018) in which it was reported that social stigma, lack of emotional support, stresses and new life adjustments were issues that adversely affected the teenage mothers and the neonatal care and of which they needed sufficient support. Similarly, the findings of this study concurred with findings of a study carried out in Australia by Miura et al (2018) in which the teenage mothers complained of being abandoned,

neglected, rejected, abused by family members, living in bad environments and complete lack of support.

Additionally, a study in Mexico by Reyna, et al (2017), revealed that adolescence mothers lacked affection and support from their parents who were very authoritative and never listened to them. As a result, the teenage mothers sought attention and love outside the family circle as affirmed by the findings of this study. On the other hand, the findings of this study contradict the findings of a study by George et al (2018), in which he found no statistical significance in the support relationships as reported by the respondents that family and community support played a major role during the teen pregnancy, labor, birth and the postnatal period.

So far, this study reported that before the intervention, about 50% of the respondents in the intervention arm had not acquired any skills in caring for the neonates and as such the respondents relied on peers, family members and health care providers' information. This finding is supported by De Vito (2010) in her study that identified the need for guidance, health education, family support, acceptance and reassurance if the teenage mothers were to cope.

The study also revealed that most of the respondents had no stable ways of sustaining their needs and those of the neonates. As such, most of the teenage mothers, (58.8%), sought financial assistance from male partners, a situation that put them at more risk of sexual abuse.

Generally, the study never identified any programs, projects, groups or organizations that supported neonatal health in Busia County. Almost all, 98.2% of the respondents said that there were no such programs, projects, organizations or groups in Busia County. However, there were claims that the programs existed in the previous years but had since died off (HMT report, 2018).

Specific objective 3: Determining the difference in proportion of respondents who complete the ANC visits and hospital births among the intervention group and the control group.

In this study, it was found that 48.7% (n=110) of the respondents in the intervention group had been pregnant before and 51.3% (n=116) had not. Of the respondents who had been pregnant before (48.7%, n=110), only 10% (n=11) had attended the antenatal clinic. In the control group, the respondents who reported having been pregnant before was 61.5% and 38.5% had not. Of the 61.5% (n=139), only 11% (n=15) had attended the antenatal clinic. This gives a scenario where the increase in teenage pregnancies is steadily at almost 50% with low uptake of the antenatal services. This could be probably due to peer influence, lack of knowledge, fear of unknown or traditional beliefs. This is echoed in a study in 2014 (author unknown) in which it was estimated that about 16 million girls aged between 15 and 19 years gave birth every year. Of these, only 1.6m (10%) attended the antenatal clinic. This was however attributed to the fact that, the respondents face challenges of lack of proper antenatal information and accessibility, stigma owing to the negative attitude and misconceptions by the

health care providers towards teenage pregnancy and births. As such, most respondents fail to take up the services as it has been highlighted in the findings in this study. The expectant teenage mothers did not utilize the antenatal services fully, thus not completing the W.H.O recommended four focused antenatal visits. Never the less, a positive finding in this study was, the good ANC attendance after the intervention that saw 53.3% of the respondents in the intervention group having attended the antenatal clinic at least 2 times. In the control group, 56.2% had also attended the antenatal clinic at least two times.

However, most of the mothers in both groups did not meet the required four visits as per W.H.O. standard as only 0.9% of the respondents attained the four visits. This was extremely low. The low ANC attendance could have been attributed to, either, lack of knowledge or wrong perception or as a way of hiding the truth. Additionally, some of the respondents reported to be economically unstable and therefore, they could not afford to attend the clinic each time, hence opted to wait for labor pains to start. Others complained of long distances away from the nearest health facility while others just did not want to go to the clinic or they were not aware of the pregnancy. A similar scenario is reported in a study carried out in Blantyre, Malawi by Maria et al (2017) where the respondents perceived the antenatal care services as inadequate and not meeting their needs and expectations and therefore did not attend the antenatal clinics. This was also reported in a study in India carried out by Singh et al (2014) that saw only 22.9% of the respondents attending the antenatal

clinics. As such, the uptake recorded low utilization in these three areas. A study in South Africa conducted by Worku (2016), reported that only 18.7% of the respondents aged 13-19 years, attended the antenatal clinic as required by the W.H.O. The reasons were attributed to long distances to the nearest health facility and poor client service satisfaction respectfully. Additionally, the findings in this study contradict that found by Ali (2018) in which 30% of the respondents attended the W.H.O recommended four antenatal clinic visits. These were mostly from the economically stable families who were 2.7 times ($P < 0.005$) more likely to attend the clinics as compared to respondents from low socioeconomic families.

An attempt to find out what prompted the respondents to attend the clinic, revealed that although 50% of the respondents in the intervention group decided by themselves to attend the clinic, other respondents were under some sort of pressure from grandmothers, peers, mothers and sometimes some could be cornered to attend the antenatal clinic when they went to see the doctor for other reasons. In the control group, 41.2% of the respondents decided by themselves but the rest were also under some pressure to attend the clinic. This finding is contrary to the finding in India, where Prakash et al (2017) reported that the ANC utilization by respondents was better than that of the older mothers.

On preparation for childbirth, this study reported that most mothers had birth companions and had also managed to choose the place of birth either on their own or with the help of relatives or friends. The rest of the preparations were haphazard. Generally, the

preparedness was poor. This study finding concurred with the one done in Wolayta Zone, in Ethiopia by Gebre et al (2015). The authors noted that the preparedness was not only low but also challenging with only 18.3% of the respondents being well prepared for childbirth and to some extent ready for any complication. Additionally, the respondents received the following services; 93.8% were tested blood for antenatal profile, 71.2% tested the urine and 85.8% were immunized with Tetanus Toxoid, 94.2% were fully examined and 92.5% were counseled and tested for Mother –To- Child -Transmission of HIV. This information was emphasized due to its role in determining the neonatal outcomes.

5.2.2: Part 2: Intervention

Specific objective 4: To find out how the “Evidence-based health education’ strategy influenced the reduction in neonatal mortality among respondents in the intervention group

5.2.2.1: Theme 1: perception towards the intervention

From the responses of the teenage mothers, it was evident that as much as they attended the clinics, they treated it as routine and as such, they did not think that they benefited from the teachings in the clinic. They felt negative because of not being recognized or understood *‘We would be asked if we knew these things’, how could one know, ‘they don’t even understand us and our problems’*. The respondents echoed in a chorus. Similarly, the respondents were quite positive with the intervention because of how it was conducted allowing full and active participation in the process. This generated a lot of valuable

information that had not been availed to them during the visits in the clinics *‘These teachings are good because I have learned a lot’*. From the interactions, the respondents realized their responsibilities and resolved to work on their own *‘Now we have learned and so me as person, I will not leave the responsibilities to my mother or grandmother’*, an eighteen year old mother of two children summarized. This was supported by a study carried out in Nepal, 2019 (unknown author) which reported that the adolescent mothers felt that they were never recognized by the health care providers but instead humiliated them publicly.

5.2.2.2: Theme 2: Lessons learned

The respondents were particularly impressed with the groupings and the sitting arrangement (circular) as they felt it provided them with free space, visibility and that everybody could be heard. They also appreciated the fact that the sessions did not take long *‘We talked among ourselves without fear and it never used to take long time’*.

Those who were already mothers, were handy in giving information via their experiences, a step that deeply encouraged the beginners and gave them hope. *‘When I realized I was pregnant I felt like I would die but when I talked to mum, I felt relieved and attended the antenatal clinic throughout’*, one of the old timers explained. *‘My first baby died because she was given herbs and they refused to take her to hospital’*. One of them cautioned!

In this study, most respondents seemed to have numerous unmet needs that required psychological attention. The respondents complained of several challenges. This finding was supported by the findings by Erfina Erfina et al (2019) in their research where they concluded that there was need to address the challenges the adolescent mothers encountered.

5.2.2.3: Theme 3: Suitability of the intervention

It seemed obvious that respondents applauded the approach ‘Nooo!!!!!!!!!!!!!!!, let it continue’ this was part of the instant answers to a question that was posed to them about reverting to the usual antenatal care process and how they felt about the strategy. This, however, revealed the fact that there were serious gaps in the antenatal care that the staff may not have noted and that there is need to address them. For the gaps to be filled, the County Government would need to adjust space and time without undue strain and obvious demarcation lines between the general antenatal mothers and the teenage mothers. If the strategy is adopted, the respondents stand to gain since their needs would be resolved. This will also encourage other young mothers to seek and utilize the maternal and child health services as well as the family planning. It will also help reduce neonatal illnesses and deaths.

5.2.3: Part 3: Follow-up and evaluation

Specific objective 5: Compare the neonatal morbidity and mortality among respondents in the intervention and control groups

In this study, it was reported that, of all the neonates who were born during the study period, 31% of them in the intervention group fell ill as compared to 28.8% of the neonates who fell ill in the control group. The difference is possible because the respondents in the intervention group after the sessions were likely to have reported the ill neonates as compared to the ones in the control group who had not been exposed to the intervention.

It was further reported that most of the neonates who fell ill in the intervention group, 90% of them fell ill at least once or twice in the four weeks after birth and 95.4% of the neonates in the control group who fell ill, it was either once or twice in the four weeks. The mode of treatment was as follows: for mothers in the intervention group, 80% took their neonates to the hospital for treatment while the majority of the mothers in the control group, 83.0% opted for traditional treatment and the Over-The-Counter drugs. This difference in the treatments can be attributed to the fact that the respondents in the intervention group applied what they discussed in the sessions while mothers in the control group-maintained the status quo.

The causes of illness were attributed to witchcraft, ($p < 0.000$), Negligence, ($P < 0.000$), infections ($P < 0.000$) and bad eye, ($P < 0.034$). This was quite evident even during the sessions when mothers would argue about whether to follow strictly the culture or change to modern health care practices. Some respondents gave themselves the assignment to inquire for the details from their parents or spouses and friends and share the same in the following sessions.

It was interesting to listen to the teenagers reasoning their ways out and reaching consensus of what they felt was correct and helpful to them. They felt that some of the causes of illness could be prevented if only correct information was communicated in time. Similarly, all teenage girls could be made aware of the consequences of haphazard sexual relationships and the consequential burdens. All this was supported by a study carried out in Nigeria by Undelikwo, et al (2018) who argued that cultural beliefs and practices had negatively affected modern health care practices, especially pregnancy, childbirth and neonatal care practices and greatly contributed to increased neonatal morbidity and mortality.

The study also reported that there were four (4) cases of congenital abnormalities (2 in each group) of which the outcome was not favorable as two died and the young mothers who had theirs still alive, were asked by their parents to take the neonates back to their biological fathers. Whereas this was not a major issue in this study, congenital malformations were also not a direct cause of neonatal mortality in a study carried out by Saini et al (2016). The study reported only 1.7% of neonatal deaths due to congenital abnormalities against 0.9% in the Busia study.

The study further reported that 27 neonates died in the intervention group compared to 42 neonates who died in the control group during the study period as compared to 78 cumulative neonatal deaths before the intervention which accounted for 58% neonatal deaths. These results show a reduction of 31% in the intervention group and 16% reduction in the

control respectively when compared to the period before the intervention. However, the reduction in the control group was by default and not because of the education as they were not subjected to the intervention. Furthermore, every precaution was taken to ensure there was no crossover. The possible causes of the deaths were varied and almost of equal magnitude ranging from 71.4% to 95.6%; disease/infection, prematurity, Witchcraft and negligence with significance $P < 0.000$. This indicated a significant relationship between the state of life and the associated causes of death. The study results concur with Katie et al (2018) on issues of prematurity and neonatal sepsis was the commonest causes of neonatal death among others. Similarly, W.H.O (2015) statistics indicate that, worldwide, the major causes of neonatal deaths are infections at 36%, prematurity at 28% and birth asphyxia at 23%. Though the rate was higher in Busia study, there was at least percentage reduction.

This study indicated that there was no significant relationship between the state of life and delay in seeking medical assistance as a cause of death although during discussions it sounded like it was the major contributing factor to neonatal deaths. However, using the T-test of paired sample statistics, the Mean for the intervention group was 1.22 while that of the control group was 1.48 indicating a drop in mortality after intervention by 0.26. The results further indicated $p < 0.031$ which was less than 0.05 hence the conclusion that there was a statistically significant difference between the intervention and the control Means. This also explained the impact of the intervention. Most neonates in the intervention group died before

day 5 of birth while in the control group, most neonates died between day 6 and 12. This finding agrees with most researchers, including W.H.O, (2014) who have found out that most neonates die during the first week of life. Most of the deaths still occurred at home in both groups. This explained the sentiment of respondents that the community does not value the health of the neonate and therefore would not take them to the hospital. Some mothers declined to disclose where the neonates died because it was an abomination to talk about the death of twins or of incest neonates. Like the illnesses, neonatal deaths were highly associated with witchcraft, prematurity, neonatal infections and negligence. When a chi-square was done, it was found that there was a significant relationship between state of life of the neonate and all the four variables as causes of death, sig: 0.000 for each variable. This finding concurs with the findings in a study carried out in Rural Ethiopia by Weldearegawi (2015), where three of the above variables, except witchcraft were implicated as major causes of neonatal mortality. Therefore, premature neonates ($p < 0.022$), neonates with delayed assistance ($p < 0.023$), inaccessible services ($p < 0.040$) and neglected neonates ($p < 0.017$) were at increased risk of dying in the neonatal period. Likewise, in a multi-country survey, conducted by W.H.O, (2010) it was found that teenage mothers, (aged 10–19 years) had higher risks of preterm delivery and severe neonatal conditions among others as compared to the mothers aged 20 years of age and above.

Suggested ways to reduce neonatal deaths majorly included; 58% (n=131) of the respondents who suggested 'Health education to the respondents while 53.5% (n=121) of the respondents suggested community awareness and education on neonatal health and care. This finding concurred with a similar finding in a study carried out in Bangladesh by Shahabudd in, et al (2018) in which he concluded that for teenage neonatal mortality to be averted, there was need for health education and awareness to the teenage mothers, families, community and health care providers. Christiane et al (2020) noted that work was needed to design and implement better standardized information processes, recording and reporting tools, and to strengthen the information system workforce to collect and report correct data..

This study found out that before the intervention, most respondents, 86.7% seemed not to know that some deaths are preventable. This was likely to be due to poor support system that kept the respondents away from people who would otherwise help them. Most respondents never attended the antenatal clinic. For those who did attend the antenatal clinics, did not get enough information as current. Because the community did not care about neonatal health, likewise the respondents never found it an issue. Additionally, the traditional beliefs and practices, rather blocked the respondents from critically thinking and making own decisions. Since death was mostly pegged on witchcraft, it was believed that little could be done to prevent death. Compared to the Kenya neonatal mortality (2018); 19.6 per1000 live births, the study findings were higher.

After the intervention, this study reported that most, 57.5% of the respondents in the intervention group agreed that the antenatal services were sufficient and that they would go a long way to reduce the neonatal deaths, 51.8% of the respondents agreed that neonatal morbidity and mortality had improved, and that generally the services were better than before as the health care providers carried out their work fairly well. Still 48% of the respondents agreed that the birth process was well managed. However, the respondents in the control group, were of different views as only 27.9% agreed that the antenatal services were sufficient, 58.5% were not sure about the working of the care providers because they did not have anything to compare them to as they did not go through the intervention process. This state of doubt calls for the streamlining of the healthcare working system in Busia County Referral Hospital.

The major concern of the intervention was to identify ways to prevent further neonatal deaths. However, the study found out that most respondents, 58%, were of the opinion that, health education on all aspects of teenage issues and neonatal care should be given to the parents and in particular the male parents because they were the ones who never wanted to understand their daughters' dilemmas. The males make life unbearable for the expectant and nursing teenage mothers. 73% of the respondents further suggested that male involvement should be made compulsory to make men responsible since pregnancy is by two people. This was arrived at after a lengthy discussion on the behavior of men who are fond of making girls

pregnant and nothing happens to them. Secondly, 53.5% of the respondents wished that the community members could be educated on the value of neonatal health, neonatal care and its importance because they were the beginning of problems. The community members despised the expectant teenagers and treated them like outcasts with a lot of stigmatization and rejection. The community poisons some parents who would otherwise have accepted their daughters' situations and allowed them back to school. Thirdly, about 50% of the respondents suggested that the health facilities could come up with structures to have qualified staff periodically follow up the neonates unlike the current community health volunteers who sometimes may be compromised.

Other respondents suggested that the local administration could devise ways, teen pregnancy could be discouraged. This would be possible if a lot of health education is given to the teenage girls before but not when they are already expectant. The grandmothers, the mothers, the aunties and other guardians, all need to be educated on the issue and keep the girls busy to avoid idling. Discouraging girls from hawking and street vending and make them occupied at home and school would help in reducing early pregnancies. These methods were used in a study, KwaZulu, Natal in 2019, with very good outcome. Most of the respondents in the control group were in agreement with the members in the intervention group but 66.8% added that initiatives that would occupy the teenage girls should be introduced in the County to combat idleness and involvement in illicit activities. Still 50% of the respondents felt that

the staff at the health facilities were not doing much to save the neonates because they lacked modern technology resources.

5.3: Evaluation of the Intervention

The outcome of the two groups (intervention and control) was measured at four (4) weeks post-childbirth, evaluated and compared to ascertain the differences. The two groups were compared in terms of the differences in the number of the respondents who completed ANC visits, number of facility/skilled births, number of the neonates, who died, and the immunization, postnatal care and family planning uptake. The results were further compared with the baseline findings to note the changes. The intervention group was evaluated for the impact of the health education strategy during the study. It was found that most respondents rated the intervention above average. The respondents further gave their overall comment as; the intervention was informative and rated it on a scale of 10points as follows, 92% rated it between 6 and10 saying, it was far much better than the routine antenatal care. This finding concurs with the conclusion of a review study by Homer et al (2012) in which “satisfaction was rated highly in mothers who were allocated to group antenatal care as compared to those who attended the routine care. In this trial, the mean satisfaction with care in group antenatal care was almost five times higher compared with those allocated to standard care.

Further evaluation by the respondents revealed that most (88.5%) found the intervention beneficial and that 97.5% of the respondents would apply the same information in

subsequent pregnancies. A further 92.5% said they would advise their expectant friends to use the information. Overall, 78.3% agreed that this approach had reduced the neonatal morbidity and mortality although not a big extent because not all respondents were taught.

The study further found out that almost all the midwives (5/6) totally agreed with the teachings of the intervention, noting that it was effective in that it managed to have a good number of respondents attend the antenatal clinic, give birth in the hospital, and even improved the MCH services uptake. They felt it was a good approach to antenatal care if the hospital management could adopt it. While it was a good motivation to the teenage mothers, it was a challenge to the midwives who may need to reorganize the structure of work and may require more staffing. All variables were compared to note any changes in the two groups.

This study revealed that 48.7% (n=110) of the respondents in the intervention group had been pregnant before of which only 10% (n=11) had attended the antenatal clinic. In the control group, 61.5% (n=139) respondents had been pregnant before of which only 11% (n=15) had attended the antenatal clinic. This reflects very poor uptake of antenatal services. This could probably be due to peer influence, lack of knowledge, fear of unknown or traditional beliefs. This is echoed in a study in 2014 (author not known) in which it was estimated that about 16 million girls aged between 15 and 19 years gave birth every year and only 1.6m attended the antenatal clinic. The respondents were particularly impressed with the health education sessions, the groupings and the sitting arrangement (circular) as they felt it

provided them with free space, visibility and that everybody could be heard and the fact that it did not take long. A similar arrangement was used in a study in Cameroon (author not known). It was reported in this study that of all the neonates who were born during the study period, 31% of the neonates in the intervention group fell ill as compared to 28.8% of the neonates who fell ill in the control group. In this study, it was noted that neonatal morbidity and mortality were never valued by the community and as such there was under-reporting of the cases. This explained the poor social support system for teenage mothers. This was echoed by Målqvist, (2011) and Jalemba et al (2015). Similarly, 27 neonates died in the intervention group as compared to 42 neonates who died in the control group. These results concur with those in a study by Gurmesa et al (2014). The study reported 73.9% (n=167) health facility births, 13.3% (n=30) home births and 12.4% (n=28) TBA assisted births. These results contradict a study in Bangladesh by Sarker et al (2018) which reported that maternal healthcare utilization among the respondents was low. This study found out that child-bearing in Busia started at 12years and reached climax at age 18. Ninety-seven-point eight percent (97.8%) of the pregnancies occurred between 16 and 19 years. This contrasts a study carried out in Nairobi by Beguy et al (2013) in which they found that 34% of the teenage mothers became mothers by the age of 18 years.

5.4: Conclusion

With the above findings supported by other study findings from various researchers, this study concluded the following:

- **Maternal Demographic Findings**

The teenage mothers became mothers as early as at 12 years of age, reaching the peak at age 18 to 19 years, when they had 2-3 children. Further to this, most respondents were single and unemployed. The education level was low as these mothers dropped out of school mostly at form 1 and 2 once they conceived and never resumed. Due to family pressure, rejection and stigma, the respondents found themselves living with other relatives (grandmothers and aunts among others). Due to lack of knowledge and the low socio-economic status, most respondents had their newborns at home assisted by unskilled service providers.

- **Specific Objective 1: Risk Factors**

The study concluded that although many risk factors cut across most countries, cultures and health provisions as evidenced by findings in other studies, the respondents in Busia faced the following unique risk factors; most respondents abandoned their neonates in the care of grandmothers who did not have sufficient knowledge to care for them and especially the preterm neonates. Such respondents never breastfed their neonates forcing the carers to prepare other stuffs and fed the neonates on thus paving the way for neonatal

malnutrition and death. The long distance away from the nearest health facility and the first delays contributed significantly to neonatal morbidity and Mortality.

- **Specific Objective 2: Support System**

The study further concluded that, the family and social support systems were poor and therefore the respondents did not receive sufficient support from the parents and the community at large during pregnancy and the postnatal periods including care of the neonates. The stigma and rejection rendered the respondents feeling inadequate and incapacitated and as such lacked the will and confidence to care for their neonates. The respondents could not make decisions over their lives and that of their neonates, neither could their mothers do. Men (particularly their fathers and uncles) took over all the responsibility to harass the pregnant and nursing daughters and nieces yet leave the sons or the men responsible for the pregnancies to go Scott free. It was therefore concluded that cultural beliefs and traditions still hinder the improvement of neonatal health care and largely contribute to neonatal morbidity and mortality. The respondents felt lost and left out; in schools, in the family, community, by peers and health care providers at the health facilities during their antenatal visits, labor, childbirth and the entire nursing periods.

Objective 3: Antenatal Care:

The study further concluded that antenatal clinic uptake by the respondents had been poor but fairly improved after the intervention; a clear indication for the need for continuous

education. This was evidenced by most of the mothers shying away from attending the antenatal clinic and giving birth at home due to what they termed negative attitude and harsh statements from the health care providers on teenage pregnancy and births.

Specific Objective 4: effectiveness of the Health Education intervention

The health needs and expectations of the respondents in Busia could effectively be realized through “Teenage Evidence-Based Health Education and Peer-group Antenatal care” as expressed by the teenage mothers. They felt it was better when they discussed and shared among themselves unlike when they were taught together with the older mothers. It is also evident that the teenage group- approach to antenatal care significantly and positively improved the antenatal visits as well as facility childbirths among the teenage mothers. Consequently, a reduction in the rate of neonatal mortality from the initial 58% before the study to 11.9% in the intervention group cannot be overemphasized.

Specific Objective 5: Neonatal Morbidity and Mortality:

The prevalence of neonatal mortality was lower in the intervention group (n=27) compared to the control group (n=42) after the intervention. The intervention group recorded 11.9% neonatal deaths and the control group recorded 20.8% deaths respectively. This was a reduction of 46.1% for intervention and 37.2% for the control group.

5.5: RECOMMENDATION

That the Busia County Referral Hospital policy makers, division of health, takes a step to try and enforce the findings of this study as follows:

1. Create space for the integration of antenatal and other services for expectant and nursing teenage mothers to enable group and peer free learning and sharing. This will enhance information acquisition especially the information that relate to reproductive health in a language best understood by them and which can help them mold into responsible parents of their time.
2. Set up a program to strengthen the social support system for the teenage mothers through the office of County social work and social corporate responsibilities
3. Re-enforce community health education and awareness on antenatal care through the office of public health office and County Community Health Nursing with the help of the community health volunteers and workers.
4. I strongly recommend the adoption of the 'Evidence – Based Health Education strategy by the County for the reduction in neonatal mortality and this could apply to all mothers if deemed beneficial.
5. There is need for more research work, especially qualitative to find out the long-term psychosocial effects of teenage pregnancy, childbirth and neonatal care.

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APPENDICES

Appendix 1: Time Frame

Sept. 2015-Dec. 2016	Jan.–Mar. 2017	April – Aug. 2017	Sept.2017-Feb. 2018.	Mar/April2018	May 2018	June- Sept. 2018	Oct. 2018
Presentations of concept paper, Proposal Writing, Presentation							
	Presentation of final proposal and submission to ERC						
		ERC correction and resubmission for possible approval Possible publication of baseline paper					
			Preparation of materials Data collection Data analysis Intervention				
				Evaluation			
					Mock Thesis defense		

						Thesis Correction submission for examination	
							Final defense

Appendix 2: Estimated Budget

	Items	Quantity	UnitPrice	Total
1	Printing papers	55 reams	500.00	27500.00
2	Fools caps	11 reams	400.00	4400.00
3	Facilitation	-	-	600,000
4	Laptop	1	65,000	65,000
4	Colour Printer	1	86,000	86,000
5	Cartridge	11	8,000	88,000
6	Community Health Workers	12	55,000	660,000
7	Communication	-	-	200,000
8	Training Nurse/Midwives	one week	-	70,000
9	Training materials	-	-	60,000
10	Travel and accommodation	-	-	100,000
11	Reimbursement	400	172	68800
11	Consultancy report writing	-	-	50,000
12	Results dissemination			20,000
13	Statistical support	-	-	50,000
	Publication cost(KJNM)	Online Hard copy		15,000 30,000
14	Indirect costs	-	-	50,000
14	Contingency (10 %)			217470
	TOTAL			2,932,170/-

Research Funding: This research was self-funded.

Budget Justification

The funds were spent (effort= 36 calendar months) as follows; to run/manage all aspects of the study; planning and executing the research, coordination, supervision, , planning and facilitation of health education sessions, bought a lap top, facilitating collecting data, analyzing it, reporting the findings and giving feedback and maintenance of equipment and supplies.

Personnel: Recruitment of study respondents, facilitation of Community health workers and community health volunteers in respondent follow up in the homes.

Equipment: Supplies and Materials

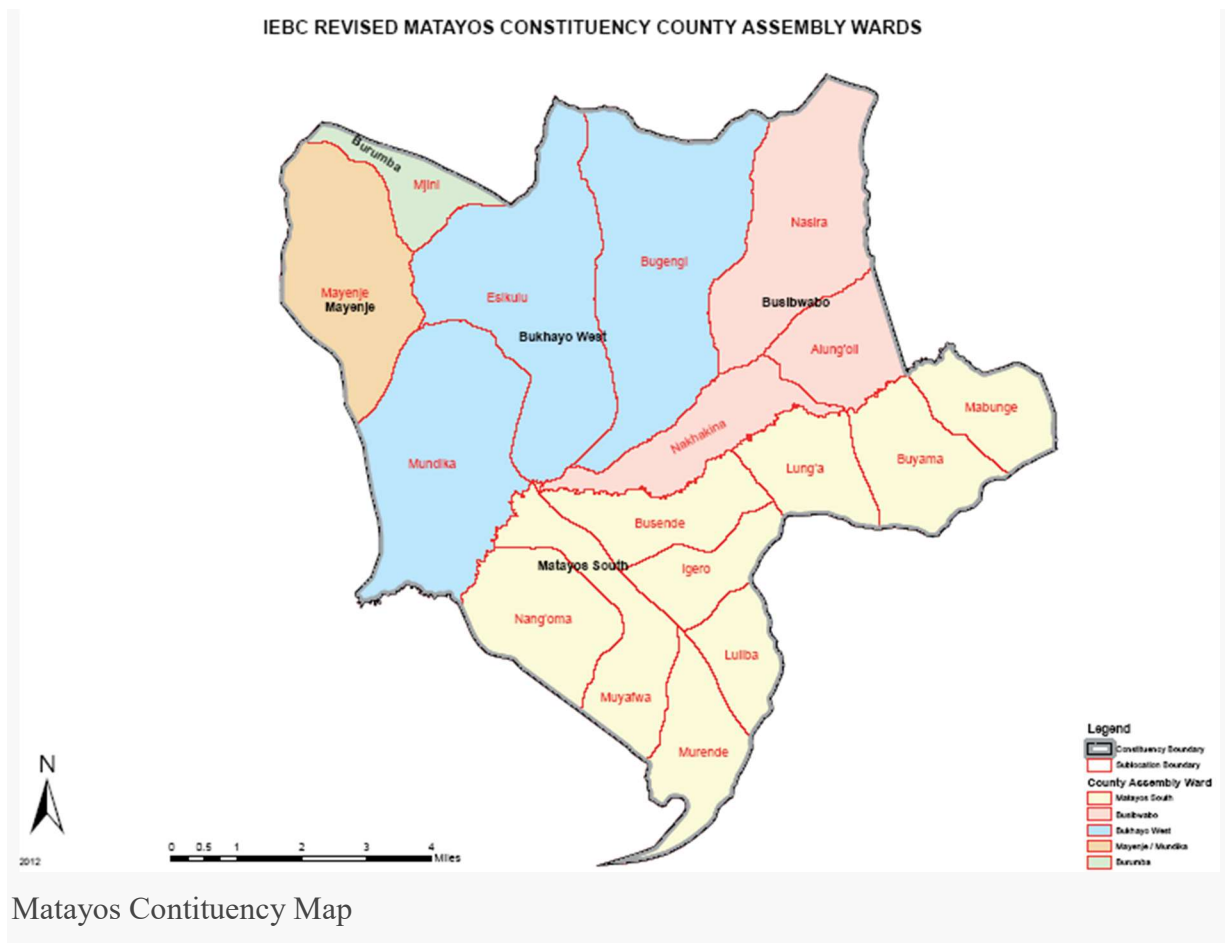
The requested funds were used to purchase the health education facilitation materials; flash disks, CDs, laptop, color printer and cartridge, antivirus (for report writing and printing), stationary (note books, pens, pencils, erasers, pencil sharpeners, ruler, scientific calculator files and folders), development of posters and fliers.

Communication, travel and accommodation: The investigator used own money to communicate with the respondents, key informants and the supervisors. This budget also helped the investigator to follow up the respondents in their homes (a radius of about 50km from Busia County Referral Hospital) and as well travel to meet the supervisors (Eldoret to Nairobi: 360km away) and the statistician (Eldoret to Kisumu: 100km away). Postage of reports, telephone (calls &SMS,) and electronic (emails) communications.

Respondent Re-imburement: It was necessary for respondents who required to attend the clinic more often on request than the usual 4weeks for some reason to be facilitated. Let's say one who requires obstetric review after one (1) or two (2) weeks.

Consultancy and Administrative Costs: This included statistical support and data analysis costs, supervision costs.

Appendix 3: Matayos Constituency Map



Appendix 4a: Consent Information Form

Evidence-Based Teenage Health Education: An Approach to Reduce Neonatal Mortality among Teenage Mothers, Busia County

Statistics has shown that neonatal mortality has remained a serious concern in Busia and Kenya. Whereas many strategies and projects have been employed to reduce the neonatal mortality, no much success has been realized. The rates still remain high. The study design will be a Randomized Control Trial (RCT) involving expectant respondents aged 19 years and below. The mothers will be sampled using consecutive technique. Thereafter the mothers will be subjected to interactive evidence-based health education sessions.

Purpose of the study: The study purposes to find a solution to reducing neonatal mortality amongst respondents in Busia County through 'Evidence -Based Teenage Health Education' approach. The health education will address; predisposing factors to neonatal mortality, care during pregnancy, neonatal care practices, breastfeeding, neonatal health seeking behavior, cord care, social support, neonatal hygiene, infrastructure, reinforcing factors and the enabling factors.

Rights of the respondents: In order to participate in this study, you must be aged 19 years and below, expectant and a resident of Busia County. Your participation in this study is purely voluntary. You are free to withdraw from the study at any time as the decision is yours. You are free to ask any questions about the study. You will be selected randomly and subjected to questions in the questionnaires that will be answered voluntarily. After analysis, you be entitled to getting the report as a feedback. You will also take part in the intervention strategy by way of group discussion and interaction. There is no legal binding by signing the consent.

Study Benefits: the study will help create self- awareness among the expectant respondents at Busia County, the knowledge gained will indeed fill the gaps in neonatal care by the respondents as well as their families and by extension the community; improved neonatal care and reduced neonatal mortality is expected; findings will be beneficial to the whole community since the incidences of neonatal morbidity and mortality will be checked through preventive practices; good health seeking behavior,

good antenatal care, hospital births, fewer neonatal deaths and less neonatal morbidity states. Risks involved are minimal as there will be no invasive procedures carried out.

Confidentiality: all the information you will give will be treated with utmost confidentiality. All information will be coded and kept under lock and key only accessed by I. The information is purely for academic purposes but with your permission it can be used for future policy making for the care of neonates. The study may be published or presented in public forums. Your identity will not be disclosed.

The data will be analyzed and the feedback given to the respondents.

Contact Information: For any questions, kindly contact the following persons:

1. Anne Wawire Kabimba, email: annekabimba@gmail.com Tel.+254 725 411 421
2. Dr. E. Matheka, Lecturer, School of Nursing, University of Nairobi
3. Dr S. Wakasiaka, Lecturer, School of Nursing, University of Nairobi
4. KNH-UON ERC, Email: uonknh_erc@uonbi.ac.ke

Appendix 4b: Amelezo kendagano.

Esirwe: Buchungizi bwokhufwa khwa abana bebo abebulwa nende abakhana babukha, emiko 19 nende hasi, nokhwekesia abo abali hasiro engira chiokhwelinda okhurula nga mwana mwibo yibulwa mpaka omwosi mulala nende enusu khwabo abeja musipitali ya Busia.

Esabu ya bana bebo bafwa musialo sia Kenya ebukwe yekesia mbu enemba yendelea okhuchia akulu. Khulwako, abandu ba Busia vosi vali nende eenda mno. Ingawa emikanda mingi kiriho khulwokhukhonya okhupunguza efwa lino, kha basiri khufaula ebilayi. Obunchunguzi buno bulakholwa khu bana bakhana emiko 19 nende hasi, nabo nibaba bali asiro. Abamama bano balikhuchakulwa nga beja mukililini ya bali asiro. Anyuma, a bamama bano balikhwekesibwa okhulondekhana nende amakhuwa ka afya yabwe.

Esifune siobuchunguzi: obchunguzi buno bwenya khumanyirisia ako kosi akanyala khukholwa ili efwa lia bana bebo likalukhe hasi hasa Busia hano. Abamama bene balabola

ako kosi akabanyala khukhola. Kwa mfano okununia khulwe miezi chisasasba, okhukhola usafi bwomwana na kandi.

Ehaki ya bachakulwe: Ili omchakulwe afukirirwe okhwingizibwa mu buchunguzi, ni lazima abe emiko 19 na anyuma, abe nail asito, ne abe niyamenya Busia ya Kenya. Okhwingizibwa mu buchunguzi no khwenya khwa siamulala. Onyala okhutulamo ebikha viosi viosi vyawenyere. Olinnende buru bwokhureba amarebo kosi okhulondekhana nende obuchunguzi. Ochunguza yeja okhuha ekearatasi ya marebo koli khujipa. Badaaye olanyola amajibu ko buchuchu nguzi. Bosi abachakulwe veja okhwekesibwa. Niwa khasina, kha sutia mbu onyala khsitakiwa.

Obukhonyi bwobunguzi: Bulakhukhonyaokhwemanya mwene, nende okuyetana bene khu bene abakhana baraka aba Busia. Emania elimnyola, lilikhukhonya vosi; has asana amadala mangi khulwobulindi bwa bana bebo. Alugongo hosi alanyola obukhonyi ne sifune mbu efwa lia bana bebo licha khupungukha esikira mwesi mwalekesiwa nga mnyala okhulera omwana mwibo bila okhuchia musipitali. Obuchunguzi wuno khasiuli nende madhara kosi.

Esiri yao: kosi kochia khulomaloma kaliba esiri yao, omundu undi kha sialamanya. Elita liao khasililarumikha. Kosi akaandikwe kalafungirwa nende okhola uchunguzi. Amakhuwa kano kosi kena skulisa, lakini nukhuha munwa khunyala kuhandika mu kaunti khulwokhunya serikali. Matokeo kanyalaokhubolwa mumikhung'ano kindi lakini mera kenywe khasikamanyikha.

Amarebo kosi andika nomba yoba esimu khu bano:

1. Dr. E. Matheka, Lecturer, School of Nursing, University of Nairobi
2. Dr S. Wakasiaka, Lecturer, School of Nursing, University of Nairobi
3. Kabimba A. Wawire, email: annekabimba@gmail.com Tel.+254 725 411 421
4. KNH-UON ERC, Email: uonknh_erc@uonbi.ac.ke

Appendix 5a: Respondents’ Consent Form

My name is Kabimba Anne Wawire, a PhD Nursing student from University of Nairobi, School of Nursing Sciences; Department of Midwifery.

I will be carrying out a research on ‘**Evidence-Based Health Education: An approach to Reduce Neonatal Mortality among Teenage Mothers, Busia County Referral Hospital**

It is the requirement of this course that a student collects detailed information from a specified sample of respondents of his/her research area and presents the same information to the board for purposes of learning and examination.

The information collected will be kept confidential and not be used for any other purpose other than the stated. You are free to choose to participate or not to participate. You can also withdraw from participating at any time.

If you don’t mind, kindly sign below.

Respondent

Signature..... Date.....

Witness

Signature..... Date.....

Parent/guardian

Signature..... Date:

Witness

Signature..... Date.....

Researcher

Name.....Signature.....Date:.....

Thank you for choosing to participate in this study.

Appendix 5b: Endagano ya bachagulwe (Kiluhya version)

Elida liange bananga mbu Anne WawireKabimba, omusomi okhudula msikuli ya university ya abanasi ya Nairobi. Esomera ediguri ya akulu.

Ndi ano khulwokhukhola buchungizi bwokhufwa khwa abana bebo abebulwa nende abakhana babukha, emiko 19 nende anyuma, nokhwekesia abo abali hasito engira chiokhwelinda okhwola nga mwana mwibo yibulwa mpaka omwosi mulala nende enusu khwabo abeja musipitali ya Busia.

Esikuli siabisia elago mbu omusomi yesi yesi akwanirwa okhukhola buchunguzi okhulondokhana nende amekesio kake. Amajibu ka uchunguzi katumikhirwanga khulwo khuhana amakisi khu musomi. Kho omusomi kenyekha achakule esaizi endidi ya bandu abanyala khujiba amarebo ka baandigire.

Amakhuwa kosi akachiakhubolwa kalaba siri. Kha lida liao nende hodula sibimanyikha bee.

Khu lwako, niwe mwene onyala khufugirira kose okane okhweyunga nende uchunguzi. Nidali onyala okhudulamo nukhenyire okhwendelea.

Khusaya nojama weyunge niba ofugirire.

Omuchagulwe

Elida.....

Saini.....

Endalo.....

Shaidi.....

Saini.....

Endalo.....

Omwibusu/omulindi

Elida.....
Endalo.....
Shaidi.....
Endalo.....

Saini.....

Saini.....

Okhola buchunguzi

Elida.....
Endalo.....
Otio mno khwiyama.

Saini.....

Appendix 6: Statement Consent

I have read/had consent read for me and discussed it with I. I have had my questions answered in a language I understand (Kiswahili/Kiluhya). The risks and benefits have been explained to me. I understand that there is no monetary benefit and that my participation is voluntary and that I can choose to withdraw at any time. I freely agree to participate in this study. By signing this consent form, I have not given any of the legal rights that I have as a respondent, parent or guardian.

Parent/Guardian's Sign..... Date.....

Respondent's Signature:Date:

I, the undersigned have explained the relevant details of this research study to the respondent and believe that she/he has understood and given informed consent.

Name: Sign..... Date:

Role in the study:

Appendix 7: Key Informants' Consent Form

My name is Anne WawireKabimba, a PhD Nursing student from the University of Nairobi, School of Nursing Sciences; Department of Midwifery. I am here to carry out a study on **‘Evidence-Based Health Education: An approach to Reduce Neonatal Morbidity and Mortality among Teenage Mothers, Busia County Referral Hospital’**.

It is the requirement of this course that a student collects detailed information from a specified sample of respondents of his/her research area and presents the same to the board for learning and examination. I would therefore like to collect some information about you and your work as an in charge of your ward/unit. The information you will give will be kept confidential and only used for the purpose stated above.

Purpose of the study: The study purposes to find solutions to reducing neonatal morbidity and mortality among neonates born to respondents in Busia County through ‘Evidence -Based Teenage Health Education’ approach. The health education will address various factors that influence neonatal morbidity and mortality.

Rights of the Key informants: In order to participate in this study, you must have been selected purposively based on your position as the in charge of the unit. Your participation in this study is purely voluntary. You are free to withdraw from the study at any time as the decision is yours. You are also free to ask any questions about the study. After analysis, you will be entitled to getting the report as a feedback. There is no legal binding by signing the consent. Risks involved will be minimal as there will be no invasive procedures carried out.

Study Benefits: the study will help create self- awareness among the staff working with the respondents at Busia County Referral Hospital. The knowledge gained will fill the gaps in neonatal care by the staff, teenage mothers, families and the community; improved neonatal care and reduced neonatal morbidity and mortality is expected; the incidences of neonatal morbidity and mortality will be checked. There will be reduced hospital admissions since the morbidity will have been reduced through preventive practices; good health seeking behavior, good antenatal care, hospital births, fewer neonatal deaths and less neonatal morbidity states.

Confidentiality: all the information you will give will be treated with utmost confidentiality. The information is purely for academic purposes but with your permission it could be used for future policy making for the care of neonates. The study may be published or presented in public forums. Your identity will not be disclosed. The data will be analyzed and the feedback given to you.

You are free to participate or otherwise. You can also withdraw from participating in the study any time.

If it is ok with you, kindly sign below:

Respondent: Signature.....Date:.....

Researcher:

Name.....Signature.....Date:.....

Thank you for choosing to participate in this study.

Appendix 8: Letter of Authority

Letter of Authority to carry out a study in Busia County Referral Hospital

**Anne Wawire Kabimba
P.O. Box 4606-30100,
Eldoret, Kenya.
18th April 2018**

**The County Medical Officer of Health,
Busia County Referral Hospital
Busia, Kenya.**

Dear Sir/Madam,

Ref: Authority To Carry Out Research

I am writing to kindly request for your permission to carry out a study on ‘Evidence-Based Health Education: An approach to Reduce Neonatal Morbidity and Mortality among Teenage Mothers, Busia County Referral Hospital’

This will be geared towards creating awareness and introducing group teaching of the respondents aged 19 years and below simple ways of reducing neonatal morbidity and mortality.

Your kind consideration will be highly appreciated.

Yours faithfully,

Anne WawireKabimba

PhD student, School of Nursing Sciences, University of Nairobi.

Appendix 9: Data Collection Tools

Questionnaire Number

Date:

Title: Evidence-Based Health Education: An Approach to Reduce Neonatal Morbidity and Mortality among Neonates Born to Teenage Mothers, Busia County Referral Hospital

Instructions: Fill as appropriate.

Demographic Data: The Teenage Mother

1. What is your age in years?
2. Are you still in school? Yes/No
3. If No, give reason; a). No fees b). Pregnant c).Have never been to school d).
Married
4. What is your current education level a). None/Primary c).
Secondary/Tertiary
5. What is your marital statusa). Single b). Married
6. State your parity:
7. Where is your residence..... a).Rural b). Urban
8. Who do you live with? a). Parents b). Alone c). Spouse d).
Other
9. What is your occupation a). Employed b). Unemployed.
10. What is your affiliate faith? a). Christian b). Non-Christian
11. What is your approximate monthly income?
12. If you are living with parents, guardian or spouse, what is their approximate monthly income?

Objective 1: Determine the difference in proportion of respondents who complete the Antenatal Clinic visits and hospital births among the intervention group and the control group

13. Have you ever been pregnant? Yes/No;
14. How old is your current pregnancy in weeks?
15. How many times have you attended the clinic during this pregnancy?
16. If none, give reason: (Tick all that apply)
- a). Lacked information
 - b). Did not want
 - c). Economically not able
 - d). Clinic is too far
 - e). Not aware of pregnancy
17. What prompted you to start attending the clinic?
- 1). Brought by my grandmother
 - 2). Pressure from my friends
 - 3). Decided by myself
 - 4). Advised by my mother
 - 5). Felt unwell and came for treatment
18. How many children do you have?
19. Where did the previous births take place? a). Home b). Hospital
20. How did you prepare for the birth of your babies? (Tick all that apply)
- a). Had birth companion
 - b). Had preferred place of birth
 - c). Had preferred mode of birth
 - d). Organized means of transport
 - e). Saved emergency finances
 - f). Engaged someone to care for the family
 - g). Bought a baby bag
21. What services did you receive at the antenatal clinic? (Tick all that apply)
- a). Blood testing
 - b). Urine testing
 - c). Nutrition counseling
 - d). Health education on danger signs for mother and neonate
 - e). Immunization (Tetanus Toxoid)
 - f). Physical examination (height, weight, blood pressure check, fetal check, etc.)
 - g). Prevention of Mother To Child Transmission of HIV counseling and testing,
 - h). Personal and neonatal hygiene, infection prevention,

Objective 2: Identify the risk factors for neonatal morbidity and mortality among neonates born to respondents in the intervention group compared to the control group.

According to statistics, the prevalence of neonatal morbidity and mortality in Busia is high.

22. What do you consider to be factors predisposing to NNMM at individual level.....? (Tick all that apply)

1. Maternal separation/abandoning the neonate
2. Maternal infections
3. Non breast feeding
4. Low Birth weight
5. Prematurity
6. Neonatal infections
7. Poor environmental sanitation
8. Difficult childbirth/Birth complications/trauma
9. Congenital malformations
10. Traditional beliefs and practices
11. Poor maternal nutrition
12. Low socio-economic status
13. Lack of knowledge to recognize an ill neonate
14. Delay to reach health facility

23. What do you consider to be factors predisposing to neonatal morbidity and mortality at Community level.....? (tick all that apply)

1. Poor hygienic conditions for childbirth
2. Poor social support systems
3. Lack of knowledge on identification of ill neonates
4. Lack of emphasis on the care of neonates
5. Delays in seeking medical assistance
6. Cultural beliefs, traditions and practices
7. High prevalence of neonatal infections/ neonatal tetanus
8. Poor infrastructure
9. Community does not value neonatal health
10. Inaccessible health facilities
11. Preference to traditional birth attendants

12. Negligence

Objective 3: Determine the social support system for the teenage mothers.

24. Upon discharge from the facility, where will you go with your neonate?
.....

1) Mother's house 2).Grandmother's house 3).My house 4). Other

Give reason for your choice - qualitative.....

25. How will the neonate be fed? (Tick all that apply)

a).Exclusive breast feeding b). Cow's milk c).Porridge

26. While away, who will take care of your neonate?

a)My mother b). My grandmother c).My siblings d). The house help e).My partner f).Will take the neonatealong

27. How will you sustain your needs and those of the neonate?

a). Get financial support from parents b). Do small business c). From salaryd). Get financial support from partner e). Helped by mother f). Consult friends g).Helped by grandmother

28. Have you acquired any skills and knowledge in caring for your neonate? Yes/No;
.....

29. If yes, which ones? (Tick all that apply) a). Breast feeding, b). Cleaning the neonate c). Cord care d). Neonatal hygiene e).Neonatal sleep and elimination f).

Recognizing neonatal danger signs g). Recognizing ill neonate h). Keeping neonate warm

30. If No, give reasons qualitative.....

31. How is your family social support system like? a).Very supportive b). Supportive

c). Not supportive

32. How would you describe the peer support? a) Very good b) Good d) Bad

33. Give reason to your answer

34. Are there any programs or groups supporting neonatal health in your home area?
YES/NO; ...

35. If yes, name them.....

36. From whom do you get help when your neonate falls ill or dies? a). Grandparents b). Health care providers c). Peers d). Spouse e). Community f). Parents
37. Are neonatal health services available and easily accessible in your area? Yes/No;
38. How far are they from your home area? (Indicate distance in kilometers)
39. What resources and services are available in the nearest health facility?
 a). Out/inpatient care b). Immunizations c). Antenatal care d). Referral e). Breast feeding counseling f). Health education for neonatal care g). Health education on neonatal danger signs h). Neonatal physical examination i). Family planning. j). Laboratory tests
40. Indicate role of the community in neonatal morbidity and mortality among the neonates born of the teenage mothers?
 a. The community does not value the health of the neonates
 b. Lack of support to the expectant/nursing teenage mothers
 c. Stigmatization and rejection
 d. Poor recognition of the ill or diseased neonate
 e. Lack of reporting and proper records of the ill or diseased neonates

Objective 4: To find out how the “Evidence-based health education’ strategy can influence reduction in neonatal mortality among expectant respondents in the intervention group

(this was purely qualitative: Q1. What health education have you received during this pregnancy,
 Q2. How was it conducted? Q3. Would you like it changed and why?)

Objective 5: Compare the neonatal morbidity and mortality among the intervention and control groups

41. Did the neonate have any obvious congenital abnormalities? Yes/No.....
 If yes, what happened after? a). Neonate died b). Abandoned c). Chased away with t neonate
42. Has your neonate been ill in the last four weeks? Yes/No

For questions 51-54, tick as appropriate in the provided table.

	Item	Totally agree	Agree	Not sure	Disagree	Totally disagree
51	The antenatal services offered were sufficient?					
52	The Health care providers carried out their work well					
53	The birth process was well managed					
54	Neonatal morbidity and mortality has improved					

55. How would you rate the ‘Evidence Based Health Education’ intervention?

- a). Very good b). Good c). Average d). Poor e). Very poor

56. Kindly commend on the overall intervention process.....

- a). Very informative b). Informative c). Not informative d). Needs improvement

Objective 6: Describe the uptake of Maternal and Child Health, Postnatal care and Family Planning services among respondents in the intervention and control groups.

57. Where did you give birth? a). At home b). At a health facility. c). At the TBA’s place

58. Was your neonate immunized at birth? Yes/ No

59. Have you sought any other services either for you or your neonate? Yes/ No

60. If yes, which other services did you seek? (tick all that apply).....

- a). Postnatal checkup b). Family planning c). Immunization d). Treatment for the baby

61. Was this a planned baby? Yes/ No

62. If yes, which method of family planning did you use? a). Injection b). Pills

c). Implant

- d). IUCD e). Barrier f). Natural Family Planning

63. If no, would you like to prevent a future pregnancy? Yes/No.....

64. Evaluation of the intervention:

(i). Teenage mothers,

Kindly answer ‘yes’ or ‘no’ to the following questions:

- a. Did you complete the sessions
- b. Did you find them beneficial?
- c. Did you utilize the information you were given?
- d. Would you apply the same information in your subsequent pregnancies?

- e. Would you advise your expectant friends to use this information?
- f. Do you think this approach has helped reduce NNMM
- g. On a scale of 0-10, how would you grade the intervention?

(ii). Midwives at the ANC/LW/NBU.

Kindly answer 'Yes' or 'No' to the following questions

- a. Were you aware of the intervention?
- b. Did you play a role in the intervention?
- c. Was the intervention effective?
- d. Did the ANC attendance for the respondents in the intervention group improve as compared to the control group?
- e. Did the incidence of neonatal morbidity and mortality among the respondents in the intervention group reduce?
- f. The uptake of maternal and child health, postnatal care and family planning in the intervention groups improved.
- g. As a person, would you embrace this approach to antenatal care?
- h. Would you advise the hospital to adopt this approach?
- i. Do you think this approach has helped in improving NNMM?
- j. Kindly grade the intervention on a scale of 0-10.

Thank you so much for participating in this research.

Appendix 10: Interview Guide for Key Informants

Demographic Data

1. What is your age in years?
2. What is your marital status? a). Married b)Single
3. What is your level of professional qualifications? a) Certificate b) Diploma c) Degree
4. How long have you worked in this ward? a). <1yr b). 2-5yrs c). 5-10 d). >10yrs
5. What is your affiliate faith? a). Christian b). Non -Christian
6. On average, how many respondents<19 yearold attend ANC per day)
7. a) <50 b) 50-100 c. >100
8. Which antenatal services do you offer at the Busia CRH antenatal and Maternal and child health clinics?
 - (a). Teaching on danger signs
 - (b). Blood tests
 - (c). Counseling on pregnancy and child birth
 - (d). Nutrition counseling and supplements
 - (e). Birth preparedness and complication readiness
 - (g).Malaria prevention
 - (h). Vaccination/Immunization
 - (i) Personal and environmental hygiene
 - (k).Breast feeding education
 - (l) HIV/STI screening and treatment
8. What are the major risk factors associated with neonatal morbidity and mortality amongst neonates born to respondentsaged below 19 years at the BCR Hospital? (Tick all that apply)
 - a) Lack of knowledge, delays in seeking health services, cultural beliefs and practices
 - (b) Neonatal asphyxia, Severe congenital malformations, Birth injuries/trauma, prolonged/obstructed labor, umbilical cord compression/prolapse
 - (c) Maternal conditions (diabetes, pre-eclampsia, eclampsia, antepartum hemorrhage, heart diseases)
 - d). Prematurity, Low Birth Weight, Neonatal infections, Poorneonatal feeding practices
9. The teenage social system is supportive

a). Totally agree b). Agree c) Not sure d). Disagree e). Totally disagree

Thank you so much for participating in this research.

Appendix 11: Baseline Data (Jan. 2016-Dec. 2017)

Discharged home

		Frequency	Percent
Valid	Died	30	28.3
	Alive	76	71.7
	Total	106	100.0

Died/

		Frequency	Percent
Valid	Extreme prematurity	3	2.8
	Gross congenital malformation	1	.9
	Infection	12	11.3
	prematurity	12	11.3
	RDS	1	.9
	Twin 1	1	.9
	Total	106	100.0


Dis/home * Died/ Crosstabulation


			Died/					Total
			Extreme prematurity	Gross congenital malformation	Infection	prematurity	Twin 1	
D i s / h o m e	Died	Count	3	1	9	12	3	30
		% of Total	3.7%	3.7%	44.7%	40.7%	3.7%	100.0%
Total		Count	3	1	12	12	1	27
		% of Total	3.7%	3.7%	44.7%	40.7%	3.7%	100.0%

Certificate of Approval by Supervisors

This proposal has been submitted with our approval as University Supervisors for this student.

SUPERVISORS

1. Dr. Emmah Matheka,
Doctor of Philosophy (Nursing Education), UoN
Master of Public Health (MPH), Reproductive Health Research and Biostatistics, UoN
Bachelor of Nursing Sciences (BSc.N) UoN
Lecturer, School of Nursing Sciences, University of Nairobi,
Signature:  Date: 2-10-2017

2. Dr. Sabina N.M. Wakasiaka,
Doctor of Philosophy (Nursing)
Master of Public Health: Epidemiologist, HIV Clinical Trials Specialist
Lecturer, School of Nursing Sciences, University of Nairobi
Signature:  Date: 2-10-2017



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Ref: KNH-ERC/RR/588

18th September, 2017

Anne Kabimba Wawire
PhD Candidate
School of Nursing Sciences
College of Health Sciences
University of Nairobi

Dear Anne,

Research Proposal: Evidence- based health education: An approach to reduce neonatal morbidity and mortality among neonates born to adolescent mothers, Busia County Referral Hospital (P174/03/2017)

This is to acknowledge receipt of your revised research proposal and to inform you that upon review the KNH- UoN Ethics and Research Committee made the following observations and suggestions:

Some of the issues raised in our previous letter (KNH-ERC/RR/474 dated 31st July, 2017) have still not been adequately addressed. Please recheck the following:

1. Comment 2 of our previous letter on sample size determination (Section 3.3.1): Recheck the highlighted sentence on the denominators and numerator.
2. Comment 3 on illiterate participants' witness: Is the nurse witnessing the consenting a study staff? Clarify.
3. Comment 5 on study flow chart: Include consenting procedures.
4. Comment 12 of our previous letter has still not been addressed. How will verification of live status be done? You have addressed 'health status' and not the question of 'live status' i.e. whether alive or dead.
5. Comment 15 on consent form: The consent information part of the consent document has not been translated.

Recommendations

Revise and resubmit two (2) copies of the full proposal within a period of two (2) weeks' time with effect from the date of this letter. Include a cover letter that summarizes how you have addressed the comments and note the page number(s) where the changes have been made.

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Yours sincerely,



PROF. M.L. CHINDIA
SECRETARY, KNH- UoN ERC

- c.c. The Principal, College of Health Sciences, UoN
- The Director, CS, KNH
- The Chair, KNH- UoN ERC
- The Director, School of Nursing Sciences, UoN
- Supervisors: Dr. Emmah Matheka, Dr. Sabina Wakasiaka

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Ref: KNH-ERC/A/289

4th October 2017

Anne Kabimba Wawire
School of Nursing Sciences
College of Health Sciences
University of Nairobi

Dear Anne

REVISED RESEARCH PROPOSAL- EVIDENCE-BASED HEALTH EDUCATION: AN APPROACH TO REDUCE NEONATAL MORBIDITY AND MORTALITY AMONG NEONATES BORN TO ADOLESCENT MOTHERS, BUSIA COUNTY REFERRAL HOSPITAL (P174/03/2017)

This is to inform you that the KNH- UoN Ethics & Research Committee (KNH- UoN ERC) has reviewed and **approved** your above proposal. The approval period is from 4th October 2017 –3rd October 2018.

This approval is subject to compliance with the following requirements:

- a) Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
- b) All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH-UoN ERC before implementation.
- c) Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH- UoN ERC within 72 hours.
- d) Death and life threatening problems and serious adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH-UoN ERC within 72 hours of notification.
- e) 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*).
- f) Submission of an *executive summary* report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/ or plagiarism.

For more details consult the KNH- UoN ERC website <http://www.erc.uonbi.ac.ke>

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Yours sincerely,



PROF. M.L. CHINDIA
SECRETARY, KNH-UoN ERC

c.c. The Principal, College of Health Sciences, UoN
The Director, CS, KNH
The Chair, KNH-UoN ERC
The Assistant Director, Health Information, KNH
The Director, School of Nursing Sciences, UoN
Supervisors: Dr.Emmah Matheka, Dr.Sabina N.M.Wakasiaka

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KNH-UoN ERC PROTOCOL SUBMISSION CHECKLIST
(Information should be typed and handed in with copies of protocol)

To be completed by Applicant and checked by KNH-UoN ERC Office

TITLE OF STUDY: Evidence Based Health Education: An Approach to Reduce Neonatal Morbidity and Mortality Among Neonates Born to Adolescent Mothers, Busia County Referral Hospital		
Have you included all the sections in the protocol? Please answer YES, NO or NOT APPLICABLE in the "applicant column".	Applicant	Admin Office
	Yes/ No / NA	Yes/No/ NA
Details of Applicant/ Investigator/co-investigators/ supervisors	YES	
Addresses and signatures included	YES	
Any collaborating institutions, including details of collaborating investigators	N/A	
Funding agency	N/A	
Declaration of originality of study where applicable	YES	
List of abbreviations and acronyms	YES	
Operational definitions	YES	
Table of contents	YES	
Structured abstract (Approximately 200-300 words).	YES	
Introduction/background	YES	
Literature review including conceptual/theoretical framework	YES	
Rationale/ Study justification	YES	
Study questions, hypothesis where applicable	YES	
Objectives/Aims		
a) Broad objective(s)/overall goals	YES	
b) Specific objectives	YES	
c) Secondary objectives if applicable	YES	
Methodology		
a) Study design	YES	
b) Study area and site description	YES	

c) Study population description -Definition of cases/controls if applicable -Inclusion/exclusion criteria	YES	
d) Sample size determination and formula/computer program used (assumptions and reference)	YES	
e) Sampling procedure/selection of study participants	YES	
f) Screening, recruitment, enrolment and consenting procedures	YES	
g) Variables – dependent, independent, confounders (where applicable)	YES	
h) Data collection procedures (qualitative and quantitative data, field data collection instruments or tools, laboratory procedures etc)	YES	
i) Materials – equipment, supplies etc	YES	
j) Training procedures (where applicable)	YES	
k) Quality assurance procedures	YES	
Ethical considerations	YES	
Data management	YES	
Study results dissemination plan	YES	
Itemised budget and budget justification	YES	
Timeline/time frame	YES	
Study limitations and how to minimize them	YES	
Appendices		
a) Informed consent/assent explanation	YES	
b) Consent form/statement of consent	YES	
c) Study instruments or tools	YES	
d) Special information e.g. educational materials	YES	
e) Recruitment material/ Advertisement(s)	YES	
f) Laboratory procedures and reference (where applicable)	N/A	
g) Maps (where applicable)	YES	
h) Curriculum vitae attached (where applicable)	N/A	
i) Material Transfer Agreement (where applicable)	N/A	
j) Anti-plagiarism check	YES	
Paid the ERC proposal processing fee	YES	

Applicants Name: KABIMBA ANNE WAWIRE

Signature: Awire Date: 27/09/2017

KNH-UoN ERC Admin office comment: Register
Return for update

Signature: _____ Date: _____

Turnitin Originality Report

EVIDENCE-BASED HEALTH EDUCATION: AN APPROACH TO REDUCE NEONATAL MORBIDITY AND MORTALITY AMONG NEONATES BORN TO ADOLESCENT MOTHERS, BUSIA COUNTY REFERRAL HOSPITAL by Anne Kabimba

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COUNTY GOVERNMENT OF BUSIA
County Health Director
Health & Sanitation Dept
P.O. BOX 1040 – 10400
BUSIA, KENYA



Ref:CG/BSA/H/ADM/1/56VOLII(10)

Date: 10th January, 2018

To
Medical Superintendent,
Busia County Referral Hospital.

Dear Sir,

RESEARCH AUTHORIZATION – ANNE KABIMBA WAWIRE

This is to confirm that the above named has been authorized by the office to carry out a research on "Evidence Based Health Education: An Approach to Reduce Neonatal Mortality and Mortality Among Neonates Born to Adolescent Mothers at Busia County Referral Hospital".

Kindly accord her the necessary collaboration. The Research Approval letter by KNH – UoN Ethics & Research Committee (KNH-UoN ERC) is attached.

Yours faithfully

Dr. Melia Lutomia,
COUNTY HEALTH DIRECTOR,
BUSIA COUNTY.



REPUBLIC OF KENYA



MINISTRY OF EDUCATION
STATE DEPARTMENT OF BASIC EDUCATION

Telephone: 055-22152
Fax:055-22152
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BUSIA COUNTY
P.O. BOX 15 - 50400
BUSIA (K)

Ref No. MOEST/BSNRU/6/5/(154)

10th December, 2017

The Sub-County Directors of Education
BUSIA COUNTY

**RE, RESEARCH AUTHORIZATION
ANNE KABIMBA WAWIRE**

The above named has been authorized to conduct research on *"Evidence-based health education: A strategy to reduce neonatal morbidity and mortality among neonates born to adolescent mothers, Susia County Referral Hospital* Busia County, Kenya.

Please accord her necessary assistance.


ELIZABETH MARANGACH
FOR, COUNTY DIRECTOR OF EDUCATION
BUSIA COUNTY

KABIMBA ANNE WAWIRE
P.O. BOX 4606-30100,
ELDORET, KENYA.
18TH APRIL 2018

THE COUNTY MEDICAL OFFICER OF HEALTH,
BUSIA COUNTY REFERRAL HOSPITAL
BUSIA, KENYA.

*Approved
Daisy
19/4/2018*



Dear Sir/Madam,

REF: AUTHORITY TO CARRY OUT RESEARCH

I am writing to kindly request for your permission to carry out a study on **'Evidence-Based Health Education: An approach to Reduce Neonatal Morbidity and Mortality among Adolescent Mothers Busia County Referral Hospital'**

This will be geared towards creating awareness and introducing group teaching for the adolescent mothers aged 19 years and below simple ways of reducing neonatal morbidity and mortality. Study approval is attached.

Your kind consideration will be highly appreciated

Yours faithfully,

I Wawire
Kabimba Anne Wawire
PhD student, School of Nursing Sciences, University of Nairobi.



UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
SCHOOL OF NURSING SCIENCES

CERTIFICATION OF CORRECTION OF PHD PROPOSAL

PART I: RELEVANT DETAILS ON THE PHD PROPOSAL

Department: MIDWIFERY
 School: NURSING SCIENCES
 Degree Title: PHD NURSING (MIDWIFERY)
 Candidate's Name: ANNE WAHIRE KAGUSA
 Reference/Registration No: HSC/52945/2018
 Date of Oral Defense: _____
 Title of Proposal: EVIDENCE-BASED HEALTH EDUCATION: AN INTERVEN-
 TO REDUCE NEONATAL MORTALITY & MORBIDITY FROM PREGNANCY
 DOWN TO APPROPRIATE METHODS, BUSH COUNTY REGIONAL HOSPITAL.

PART II: DECLARATION BY SUPERVISOR(S) OVERSEEING CORRECTIONS

I / we, the undersigned Supervisor(s) of Corrections do hereby certify that I / we have closely looked at the corrections as instructed by the candidate's Board of Examiners and I / we do hereby certify that ALL the corrections have been effected as agreed.

NAME _____ SIGN _____ DATE _____
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 NAME _____ SIGN _____ DATE _____
 (CORRECTIONS SUPERVISOR II)
 NAME _____ SIGN _____ DATE _____
 (CORRECTIONS SUPERVISOR III)

PART III: CONFIRMATION BY DIRECTOR OF THE SCHOOL OF NURSING SCIENCES

Confirmed that the Supervisor(s) appointed to oversee the corrections have done so as per the instructions of the Board of Examiners

NAME _____ SIGN _____ DATE _____
 DIRECTOR, SCHOOL OF NURSING SCIENCES

PART IV: AUTHORITY FOR FULL ADMISSION

Authority for full registration of PhD

NAME _____ DATE & STAMP _____
 Director, GRADUATE SCHOOL



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P.O. Box 30223-00100
NAIROBI 00100

REF No: **NACOSTI/P/17/55830/19857**

DATE: **4th December, 2017**

Anne Kahimba Wawire
University of Nairobi
P.O. Box 30197-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *"Evidence-based health education: A strategy to reduce neonatal morbidity and mortality among neonates born to adolescent mothers, Busia County Referral Hospital,"* I am pleased to inform you that you have been authorized to undertake research in **Busia County** for the period ending **4th December, 2018.**

You are advised to report to the **County Commissioner, the County Director of Education and the County Director of Health Services, Busia County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit a **copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

J.P. Kalerwa

**GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO**

Copy to:

The County Commissioner
Busia County.

The County Director of Education
Busia County.

The County Director of Health Services
Busia County.

THIS IS TO CERTIFY THAT:
MS. ANNE KABIMBA WAWIRE
of UNIVERSITY OF NAIROBI, 0-30100
ELDORET, has been permitted to conduct
research in Busia County

Permit No : NACOSTI/P/17/55830/19857
Date Of Issue : 4th December,2017
Fee Received :Ksh 2000

on the topic: **EVIDENCE-BASED HEALTH
EDUCATION: A STRATEGY TO REDUCE
NEONATAL MORBIDITY AND MORTALITY
AMONG NEONATES BORN TO
ADOLESCENT MOTHERS, BUSIA COUNTY
REFERRAL HOSPITAL**



for the period ending:
4th December,2018

AWW
.....
**Applicant's
Signature**

J. Kalerwa
.....
**Director General
National Commission for Science,
Technology & Innovation**

CONDITIONS

1. The Licence is valid for the proposed research, research site specified period.
2. Both the Licence and any rights thereunder are non-transferable.
3. Upon request of the Commission, the Licensee shall submit a progress report.
4. The Licensee shall report to the County Director of Education and County Governor in the area of research before commencement of the research.
5. Excavation, filming and collection of specimens are subject to further permissions from relevant Government agencies.
6. This Licence does not give authority to transfer research materials.
7. The Licensee shall submit two (2) hard copies and upload a soft copy of their final report.
8. The Commission reserves the right to modify the conditions of this Licence including its cancellation without prior notice.



REPUBLIC OF KENYA



National Commission for Science,
Technology and Innovation

RESEARCH CLEARANCE
PERMIT

Serial No.A 16719

CONDITIONS: see back page

UNIVERSITY OF NAIROBI

Declaration of Originality Form

This form must be completed and signed for all works submitted to the University for examination.

Name of Student ANNE WAWIRE KABIMBA
 Registration Number —
 College HEALTH SCIENCES
 Faculty/School/Institute NURSING SCIENCES
 Department MIDWIFERY
 Course Name DOCTOR OF PHILOSOPHY IN NURSING (MIDWIFERY)
 Title of the work EVIDENCE-BASED HEALTH EDUCATION: AN APPROACH TO REDUCE NEONATAL MORBIDITY AND MORTALITY AMONG NEOMATES BORN TO ADOLESCENT MOTHERS, BUSIA COUNTY REFERRAL HOSPITAL

DECLARATION

1. I understand what Plagiarism is and I am aware of the University's policy in this regard
2. I declare that this PROPOSAL (Thesis, project, essay, assignment, paper, report, etc) is my original work and has not been submitted elsewhere for examination, award of a degree or publication. Where other people's work, or my own work has been used, this has properly been acknowledged and referenced in accordance with the University of Nairobi's requirements.
3. I have not sought or used the services of any professional agencies to produce this work
4. I have not allowed, and shall not allow anyone to copy my work with the intention of passing it off as his/her own work
5. I understand that any false claim in respect of this work shall result in disciplinary action, in accordance with University Plagiarism Policy.

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1	12972	Research Fees Citizens	Per Research	1	5,000.00
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Appendix 12: Publications and conference papers

Conference Papers

1. **Kabimba, A.W.**, Wakasiaka, S.N.M.; Matheka, E: Risk Factors for Neonatal Mortality: Empowering the Teenage Mothers through Evidence- Based Health Education , Busia County Referral Hospital. Midwives Association of Kenya 4th Annual Scientific Conference. St. Paul’s University, Limuru Campus, 3rd-6th Dec. 2019
2. **Kabimba, A.W.**, Wakasiaka, S.N.M.; Matheka, E: The Role of Family and Social Support System in Reducing Neonatal Morbidity and Mortality among Neonates Born to Teenage Mothers, Busia County Referral Hospital. 2nd African Neonatal Care Conference by COINN: Universal Health Care: Saving the newborn. November 14th & 15th, 2019, Nairobi, Kenya
3. **Kabimba, A.W.**, Wakasiaka, S.N.M.; Matheka, E: Role of Nurses & Midwives in ensuring sustainable Public Health Development in the Contemporary World: Regional/National Perspectives World Nurses Congress; Riverside Majestic Hotel, Kuching, Sarawak, Malaysia, 4th – 7th September 2018
4. **Kabimba, A.W.**, Wakasiaka, S.N.M.; Matheka, E: The impact of obstetrician-led maternity care: a systematic review; Midwives Association of Kenya 3rd Annual Scientific Conference 2018, Pwani University: Kilifi, 4th -17th August 2018
5. **Kabimba, A.W.**, Wakasiaka, S.N.M.; Matheka, E: Baseline Survey: Instructions and health Messages to Postnatal Mothers on Infant Care at Home after Discharge from health Facilities. National Nurses Association of Kenya (NNAK), 59th Annual Scientific Conference, Sai Rock Hotel, Mombasa County, 6th -8th Dec. 2017
6. **Kabimba, A.W.**, Wakasiaka, S.N.M.; Matheka, E: Parental Experiences of Caring for a Preterm Neonate in the Neonatal Care Unit: A Systematic Review,

National Nurses Association of Kenya (NNAK), 59th Annual Scientific Conference, Sai Rock Hotel, Mombasa County, 6th -8th Dec. 2017

Family and Social Support System in Reducing Neonatal Morbidity and Mortality among Neonates Born To Adolescent Mothers

Anne Wawire Kabimba*, Emmah Matheka, Sabina N. M. Wakasiaka

School of Nursing Sciences, University of Nairobi, University Way, Nairobi, Kenya

DOI: [10.36348/sjnhc.2020.v03i06.003](https://doi.org/10.36348/sjnhc.2020.v03i06.003)

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*Corresponding author: Anne Wawire Kabimba

Abstract

Background: The social society in Africa and most continents, perceives any girl who gives birth before marriage as a wrong doer. Such a girl is deemed to have negated the traditions. Poor and non-communication between adolescents and their parents or guardians has been implicated in most instances. The scenario is the same in the County of study according to information from the respondents and as alluded to by the County Director of health services. The parents and guardians in the County have been called upon to exercise responsibility over their daughters, encourage them to resume school instead of forcefully marrying them off or rejecting them on the bases of pregnancy. The purpose of this study was to give evidence-based health education in relation to family and social support systems in reducing neonatal morbidity and mortality among neonates born to adolescent mothers in the County Referral hospital. **Objective:** The objective of this study was to describe the role of family and social support in reducing neonatal morbidity and mortality among neonates born to adolescent mothers. **Methods:** Setting; the study was carried out at a County referral hospital using a randomized control trial design. The participants were expectant adolescent mothers aged 19 years and below attending the antenatal clinic at the hospital. A sample size of 528 respondents (264 cases and 264 controls) was calculated using Pagano formula and realized using simple randomization. Inclusion criteria: adolescent mother \leq 19 years, gestation period of 26-34 weeks and resident of the study County for sufficient time follow up. Students, non-Kenyans and mothers with existing co-morbidities were excluded for fear of loss to follow up. **Results:** Negligence and lack of support, 81% (pv 0.000), lack of community emphasis on neonatal care 77% (pv0.001), lack of value for neonatal health, 78% (pv 0.000), lack of knowledge 60% (pv0.003) and poor socioeconomic status, stigma and rejection 89% (pv0.000) were some of the significant study findings. **Conclusion:** The poor family and social support played a major role in persistently high neonatal morbidity and mortality in the County.

Keywords: Support System, Neonates, Neonatal Morbidity/Mortality, Adolescent Mothers.

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BACKGROUND INFORMATION

The social society in Africa and indeed in most continents, perceives any girl who gets pregnant and gives birth before marriage as a wrong doer. Such a girl is deemed to have negated the culture and traditions. She is therefore liable to punishment as stipulated in the specific cultural norms. Poor or non-communication between the adolescents and their parents or guardians has been implicated in most instances. The scenario is the same in this study according to information from the respondents and as alluded to by the County Director of health services. Severally, the parents and guardians in the County have been called upon to exercise responsibility over their daughters, encourage them to resume school instead of forcefully marrying them off or rejecting them on the basis of being pregnant. The purpose of this study was to implement the evidence-

based education in relation to family and social support systems and activities in the reduction of neonatal morbidity and mortality among adolescent mothers.

Specific Objectives

The study focused on three specific objectives: i). To identify the types and sources of family and social support ii). To describe the role of family and social support systems, iii). To implement and evaluate the impact of evidence-based health education.

Summary of Existing Literature

In a study on family context, poor communication within families of adolescent mothers was reported as a setback to expected support [1]. In another study carried out in Quang Ninh province, Vietnam it was noted that neonatal morbidity and mortality were never valued by the community [2]. In

yet another study in Merzin, Turkey it was concluded that the adolescent women had a low perception of social support with the families being the most supportive at a mean score of 23.32 \pm 3.23 and therefore were never given priority [3]. A study in the United States of America attributed teenage pregnancies and births to single parenthood who lacked proper social learning and integration from immediate families [4]. The adolescent mothers experienced physical, psychological, mental, social challenges and poor social support, increased chances of neonatal morbidity and mortality [5]. Lack of respect, coerced sex, sexual violations, child marriage, sexual abuse and neonatal deaths were all treated with silence in the communities and as such came with consequences to the adolescent mothers [6]. The study on adolescent pregnancy and challenges in Kenya pointed out that most adolescent mothers faced many challenges and lack of social and emotional support, social stigma, poor healthcare access, low economic status and as such were prone to stresses of new life adjustments [7].

In the study County, families and communities were reported as not valuing neonatal health and therefore when illness or death occurred, no efforts were made to respond promptly or report or even register with the registrar of deaths [8]. Devaluing the neonates made it difficult for the referral hospital and the County to keep track and document correct data as many neonatal deaths were never reported. The significance of this study identified the value of individual, family and community awareness regarding neonatal health care practices and the support systems. The study findings informed the health policy makers of the need to adjust to recommendations on neonatal care practices in order to reduce neonatal morbidity and mortality in the County. The results of this study, if adopted have the potential to change the perception of the family and community thus improve the records of the vital statistics to form a data base of records specific to neonates. The study has contributed wealthy knowledge on family, social and adolescent mother interactions.

METHODS

The study employed a randomized control trial design with allocation ratio of 1:1. The target population comprised expectant adolescent mothers aged 19 years and below attending antenatal clinic at the County Referral Hospital in Kenya. The sample size was 432 respondents (226 cases and 226 controls) [9] sampled using simple randomization technique. The data was collected using a semi-structured researcher-administered questionnaire and analyzed using EpiData and STATA version 8.0. Trend analysis was done using logistic regression, frequencies and percentages, precision was set at 95% CI or 0.05 cut off (\leq 0.05-significant, $>$ 0.05-insignificant). After data cleaning, the study realized a 14.4% loss to follow up due wrong

contacts and change of residence when the adolescent mothers relocated to their other relatives' homes.

Randomization Procedure

The researcher conducted the whole process and generated two small envelopes containing a unlabeled pink card in one and a white one in another. They were displayed for the mothers to pick one. The mothers were given the chance to pick one envelope each at a time. The mothers were not shown the color of the card they picked so as to conceal the allocation in order to reduce selection bias and influence. Pink cards represented 'Intervention' and white cards represented 'Control'. A sticker of corresponding color was stuck on the respective mother's antenatal record book. Every expectant adolescent mother meeting the inclusion criteria was selected until the sample size of 364 respondents attained for each group (a total of 728) and allocated to each group accordingly. The mothers and the midwives were both blinded. The two groups had such similar characteristics as; age range, gestation periods, referral (hospital) and health care providers, given similar information but different approaches. The respondents were recruited over 36 days during antenatal visits. They were followed up through the antenatal period, labor, birth and neonatal care up to 28 days post birth.

Eligibility Criteria

Expectant adolescent mothers aged \leq 19 years as this group of mothers had not been sufficiently researched on, gestation age, 26-34 weeks allowed researcher sufficient time for educating the adolescent mothers and following them up to four weeks post childbirth. Being residents of the study County maintained consistence and uniformity of information gathered.

Exclusion Criteria

Students, non-Kenyans and mothers with chronic morbidities requiring long term treatment were excluded for fear of 'loss to follow up'. The choice of independent variables was informed by existing literature, reports and records on high rates of neonatal mortality. While the cases were subjected to evidence-based health education intervention the controls went through the daily usual routine services at the antenatal clinic, childbirth, postnatal and neonatal care. The main study outcome was 'Reduced neonatal morbidity and mortality'. The interventions for the intervention group (cases) were conducted between March and July 2018. It was assumed that the information gathered was representative of all adolescent mothers' views and therefore sufficient enough to allow generalization within the County and beyond.

Intervention

The respondents in the intervention group (cases) were grouped in 20% based on the gestation

range; 26-28, 29-31 and 32-34 and the corresponding clinic return dates. Each group had three sessions. Each group was taken through sessions on peer, family and social support needs. The objective of this session was to explain the role of support systems during pregnancy, labour, childbirth, postnatal, breast feeding and neonatal care in reducing neonatal morbidity and mortality. The variables addressed included; acceptance of the pregnancy, cultural practices regarding adolescent pregnancy and childbirth, relationships, comfort, overcoming stigma and rejection, physical/emotional and psychological support, counseling, birth preparedness and complication readiness, birth companions and caretakers, place and mode of birth, breastfeeding, finances and coping strategies. The research adopted the interactive teaching method where the researcher gave overview of the topics, followed by question and answer sessions and sharing experiences. This served to evaluate the understanding of the topic by respondents. The teaching was based on expected/perceived support, sources of support, comfort measures and the importance. The sessions took place in a set aside room for the purpose.

RESULTS

Baseline data was extracted from 100 maternal antenatal record books randomly picked from the mothers attending the antenatal clinic and 300 most current inpatient files as follows; 30% of the record books revealed unstable areas of residence as mothers kept changing their physical contacts, 40% revealed lack of family support as most respondents never had companions to hospital or had entered their grandmothers as their next of kin, 20% revealed lack of financial support as a major setback. Only in 10% of the books, the mothers were taught basics like; signs of labour, danger signs but were never given any information on support systems. This was only at a time when nursing students came on board for clinical experience. The files showed that most (90%) of the adolescent mothers and their neonates were waived off

their bills for lack of financial support. In some files, the neonates had been abandoned probably due to stigma, rejection or lack of where to go with the baby. In 7.6% of the files, the deceased neonates were never regarded as a problem since some families requested the hospital to dispose them off or simply left the bodies.

In table 1, the respondents' demographic characteristics were summarized. The study identified the following types of support systems from the respondents: i). Parental relationship: as persons who could provide love and affection, ii). Psychological support: acceptance, caring, trust, and counselling, iii). Information support; about pregnancy and management, access to health services, danger signs, childbirth preparedness and complication readiness, breast feeding and newborn care. iv). Peer, community, and social support where sense of belonging and social identity would be found, find advice, encouragement, social interaction, dialogue, and social learning. v). Physical support: financial assistance, food security, shelter, clothing, and resumption of school. The study identified sources of support as family members, peers, relatives, schools, health workers, charitable organizations, local leaders, and the County Government.

After the intervention, the study results showed that, of the 226 respondents in the intervention group, 34% went to their own houses since some had families to look after while others considered the comfort, 28.3% opted to their mothers' houses considering the care, 23.5% went to other places (mothers in-law, aunts, uncles, friends) and 14.2% went to their grandmothers houses since there they would be accepted and valued. On the hand, of the 226 respondents in the control group, 38.5% went to their grandmothers' houses, 34.5% went to own houses, 6.2% went to their mothers' houses, 20.8% opted for other places as did the cases. These findings indicated the state of confusion and desperation the adolescent mothers found themselves in See Figure-1.

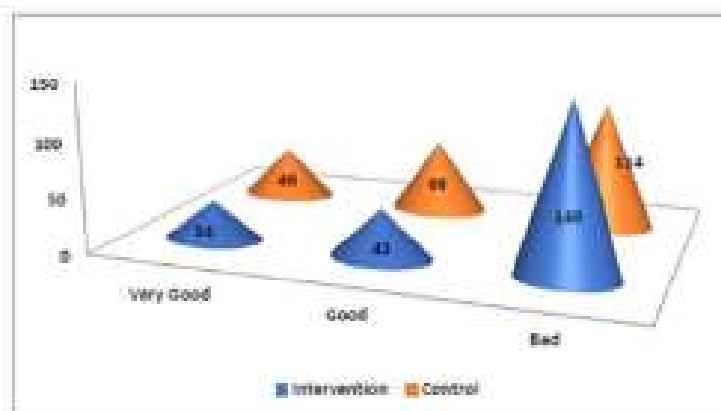


Fig-1: Peer Support System

Regarding the care of the neonates, the study results from the intervention group showed that 24.3% of the respondents entrusted the care of their neonates to their mothers due to the confidence. Most, 48.7% left the neonates with the grandmother, while 22.6% of the respondents took their neonates along. In the control

group, 17.7% of the respondents left the neonates with their mothers, 53.5% left the neonates with their grandmothers while 21.2% of the respondents took their neonates along. The trend is preference to the grandmothers.

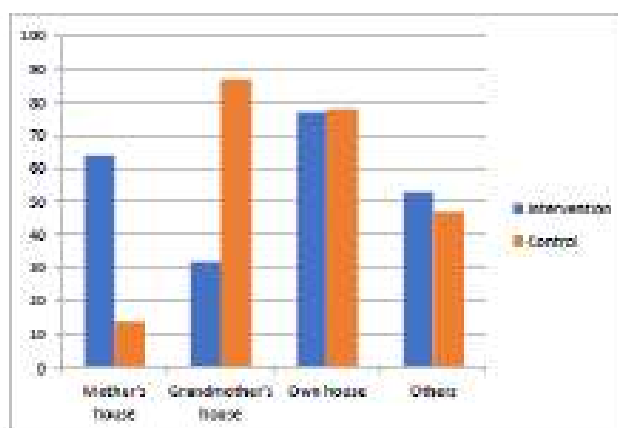


Fig-2: Preference to the grandmothers

Respondents' sustainability was as follows: in the intervention group, 35% were supported by parents, 19% did small businesses while 4.9% depended on salaries/wages and 8.4% were helped by their partners. In the control group, 34.1% were supported by parents, 12.8% depended on businesses while 4.4% depended on their salaries. Guardians supported 14.6%, friends supported 17.7%, grandmothers, 6.7%. The financial support was skewed towards parents though minimal.

In regarding the family and social support system: the respondents in the intervention group showed the following: 35.8% received minimal support, 33.2% did not receive any support as they were rejected by their families and 30.1% received adequate support. In the control group, 43.8% received minimal support, 34.8% did not receive any support, 27.9% received adequate support. This indicated that most adolescent mothers were not sufficiently supported.

Regarding peer support in the intervention group, the study results were as follows: 149/226 respondents reported "bad support", 43/226 reported "good support" and 34/226 reported "very good support". In the control group, the study results were as follows: 114/226 reported "bad support", 66/226 reported "good support" and 46/226 reported "very good support" as shown in figure 2. Overall, support from peers was reported as being bad See Figure-2

Respondents in the intervention group reported the following regarding the role of the community in neonatal care: 69.0% indicated that the community did not value the health of the neonates, 83.6% reported

lack of support to the nursing adolescent mothers, 87.2% revealed stigmatization and rejection, 56.6% indicated poor recognition of the ill or diseased neonates, 89% reported social disconnect and 77% reported lack of emphasis on neonatal care. In the control group, 70.8% reported that the community did not value the health of the neonates, 68.6% reported lack of support to the nursing adolescent mothers, 61.9% revealed stigmatization and rejection, 35.8% indicated poor recognition of the ill or diseased neonates, 78.3% reported lack of emphasis on neonatal care and 90.3% reported social disconnect. This picture reflects the poor role the community played in the care of the neonates.

Logistic Regression

At the multivariate level after intervention, social support was less likely to come from the parents as compared to grandmothers, (Exp =0.226, 95%CI [0.116-0.848], p=0.000). Financial support was less likely to come from spouses as compared to parents (Exp= 0.262, 95%CI [0.067-0.829], p=0.020). Help was more likely to come from health workers when the neonate fell ill or died as compared to family and community (Exp=0.015, 95% CI [0.015-0.902], p, =0.000).

DISCUSSION

This study identified five types of support systems that were of importance to the adolescent mothers and four areas from which each support was expected to come. These findings were also reported in other studies [3, 10]. This study further reported that the

adolescent mothers received minimal support and as such still faced several challenges. Contrary to this finding were the findings in a study in Marun [4] that reported the teenage mothers having received sufficient support from their parents and relatives. In this study, the peer support was no better with most of the respondents describing it as 'very bad'. The respondents further said that their peers were the ones who usually introduced them to men and into sexual behavior and later abandoned them once they became pregnant. This finding compares with the findings in a study that emphasized the importance of a good family –social support system in order to foster a better life for the adolescent mothers [11, 10]. Contrary to this finding, a different scenario where the government, teachers, peers, friends and parents worked together to support the adolescent mothers in all aspects including taking care of the neonate so that she could resume studies was reported [4].

This study further reported that, most respondents preferred staying in their own houses after childbirth if possible. Otherwise they would stay with their grandmothers for protection. However, the rest of the mothers after childbirth, with any other willing persons. The reasons to this type of movement were blamed on the poor social support system. To support this finding, it was argued that a good social supportive system played a vital role in molding the adolescent mothers in self and eventual neonatal care [12].

Concerning care of the neonates, this study found out that most adolescent mothers left their neonates under the care of grandmothers. The reasons were probably due to lack of knowledge and skills, in ability to cope with the demands of the neonate and lack of psychological support but they were also accommodative and sympathetic. This finding was also reported in a study where the adolescent mothers maintained that if it were not for their grandmothers and aunts, life would have been impossible to manage when caring for their newborns [12]. This finding was further supported by findings in another study that examined the grandmothers' capacities to care for the neonates and noted that grandmothers impacted positively in the adolescents' neonatal care period [13].

Most respondents in this study reported that health care providers played a vital role in supporting them during neonatal illness or bereavement as compared to the family members and the community. In fact, the culture prohibited people from mourning a neonate as it was believed that mourning prevented another baby being born. Where one twin died, it was kept extremely silent to protect the remaining twin. The adolescent mother was closely monitored in case she shed tears over the living twin. Because of this negative attitude, even the adolescent mothers also attempted to or abandoned the dead neonates in the hospital beds.

This study reported that male partners denied the pregnancies, the babies, and any liability. This finding was supported by a study carried out in Kenya which revealed that male partners of the adolescent mothers negligibly supported them [7].

The community in this study was perceived as not supportive and therefore subjected the adolescent mothers to stigma and rejection. These findings concurred with the findings in several studies which reported that social stigma, lack of affection and emotional support, stresses and new life adjustments were issues that adversely affected the adolescent mothers of which they needed sufficient support [1, 7, 14, 15].

Study Limitations: Inaccurate record keeping, wrong contacts, limited finances.

CONCLUSION

The poor family and social support to the adolescent mothers played a major role in persistently high neonatal morbidity and mortality in the County Referral Hospital. The study findings if adopted would inform the County Health Policy makers of the need to adjust to interventions for the reduction of neonatal morbidity and mortality. Similarly, community awareness would change the traditional perception of care of the neonate. The study helped to improve the record keeping of the vital statistics thus forming a database for records specific to neonates and as well contributed wealthy knowledge on family and social roles and interactions.

Availability of Data and Materials:

The researcher obtained permissions from the County Referral Hospital. More information was extracted from the Kenya Demographic Survey 2014 document.

Abbreviations:

CI: Confidence interval

Declaration: Ethics approval, consent to participate and approval letter as attached.

Competing interests: The author has no competing interests. The content in this study is the author's original research work.

Funding: Self

ACKNOWLEDGEMENT

I am deeply indebted to the following persons: my able supervisors: Emmah Mathaka and Sabina Wakavala for their exemplary supervision, mentorship and guidance, patience, and encouragement. Many thanks to reviewers, statisticians and fellow PhD Students for their inputs and support. I will forever hold

my family in high esteem for being so patient, supportive and encouraging.

Author's Information: This article is a revised version of a sub-section of my PhD thesis (Specific Objective 2).

Consent for publication: Individual data was not presented therefore not applicable.

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Paper 2:

Original Research Article

Risk Factors for Neonatal Morbidity and Mortality: Empowering the Adolescent Mothers through Evidence Based Health Education, Busia County Referral Hospital

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Abstract: *Background:* Statistics show that, neonatal mortality (NNM) accounts for approximately 40% of the under-five mortality globally. The risk factors are varied but cut across all nations. The purpose of this study was to empower the expectant adolescent mothers through 'evidence-based health education' hence reduce NNM. The study objectives were; to identify, describe and find solutions to the risk factors through health education. *Methods:* the study was carried out at Busia County Referral Hospital (BCRH), Western Kenya using a cross-sectional interventional design. 226 expectant adolescent mothers attending the antenatal clinic were randomly sampled. Expectant adolescent mothers aged ≤ 19 years, 26 -34 weeks gestation and residents of Busia County were selected. Mothers with co-morbidities, students and non-Kenyans were excluded. Ethical approvals from KNH/UONREC, BCRH; Director of Health, County Government of Busia were obtained. Data was collected using semi-structured researcher -administered questionnaires. Analysis utilized Epi Data 3.1, STATA version 8.0, Microsoft excel and reported in frequencies and percentages. *Intervention:* respondents were grouped in 20s of same gestation. A pragmatic approach was used to cushion respondents from making many trips to the hospital. The sessions were conducted by the researcher who after each overview, allowed respondents to share experiences. *Results:* risk factors identified; lack of knowledge-84.5%, poor infrastructure-83.6%, negligence-81% non-breastfeeding-80.1%, lack of emphasis on neonatal care by the community-77% and prematurity-67.3%. 87% of the respondents applauded the intervention. *Discussion:* the respondents expressed desire for neonates to be recognized and valued at home. *Conclusion:* risk factors that contributed to NNM were of due play, involving respondents and the community. This revealed gaps in information acquisition, awareness and neonatal care practices. *Recommendation:* there is need for space and age- specific care tailored to adolescent mothers and the need to step -up and intensifies health education strategies.

Keywords: NNM, adolescent mothers, risk factors, health education.

INTRODUCTION

The risk factors to neonatal morbidity and mortality cut across all nations. However, a few factors are specific to regions depending on the geographical, historical, economic, cultural and social makeup. While in the health institution set up, such factors are attributed to preterm birth which contributes to the highest mortality, low birth weight of less than 2500g, birth asphyxia, birth trauma, severe birth defects and lack of adequate resources and equipment to handle neonatal emergencies [1], in Busia, the adolescent mothers' viewpoint approves such factors as; neonatal sepsis, poor socioeconomic status, poor infrastructure, cultural beliefs, traditions and practices, neonatal negligence, lack of knowledge, non-breast feeding/poor neonatal feeding habits and malnutrition among others.

Adolescent mothers' health education seems to have been entangled in adolescent health projects. For this reason, the specific needs of the expectant and nursing adolescent mothers were not adequately addressed leading to inadequate information and misconceptions.

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Purpose of the Study

The purpose of this study was to empower the expectant and nursing adolescent mothers to manage the risk factors attributed to neonatal morbidity and mortality within their means. This was achieved through small group interactive sessions guided by the researcher. The topics to be taught were pre-determined and tailored towards helping the adolescent mothers to understand how they could reduce or prevent neonatal illnesses and deaths. This health education was not only meant to help the adolescent mothers realize their full potential but also play their important motherhood role in the reduction of neonatal morbidity and mortality.

Significance of the Study

It was necessary for this kind of study to be carried out in Busia in order to empower this unique group of mothers who have gone unrecognized for decades and instead treated like the older mothers. During health education, these mothers were handled in ways compatible to their age and level of understanding as compared to earlier days before the study when all expectant women were treated the same regardless of the age. This enabled the adolescent mothers to comprehend the information given and reason out their ways, made informed decisions, choices and took appropriate constructive actions without relying on others.

Justification

For a long time, expectant mothers were treated as passive learners and listeners to a health care provider narrating to them the 'dos' and 'don'ts' of pregnancy, child birth, newborn and postnatal care. The adolescent mothers, given the short concentration span, did not get the message, leave alone using it. As to whether there was any follow up of these mothers, pre- and post-childbirth, remains unknown. In this study, this group of mothers was carved off from the rest of the mothers for purposes of ensuring understanding and use of the information shared, follow up and adequately addressing their unique utmost needs.

Study Objectives

1. To identify and describe risk factors that predispose to morbidity and mortality among neonates born to adolescent mothers in BCRH.
2. To empower the expectant and nursing adolescent mothers through evidence-based health education.
3. To evaluate the effectiveness of the health education intervention.

The beneficiaries of the findings of this study comprised all the stakeholders. For example, adolescent mothers learned critical thinking and decision-making skills and as such were able to exercise their potential and take up their motherhood roles. There was improved neonatal care from the health fraternity. Documentation that looked general would be much easier within a system that is specific in record keeping. There would be reduced neonatal morbidity and mortality rates as awareness on risk factors will have helped the mothers care for the neonates better.

LITERATURE REVIEW

Globally, many researchers have found out that risk factors responsible for neonatal morbidity and mortality are either i). Maternal-related, non-breastfeeding, maternal malnutrition, maternal co-morbidities, neonate abandoning and negligence ii). Neonate-related, prematurity, low birth weight, congenital abnormalities, birth asphyxia, birth trauma, poor feeding habits iii). Health care provider/facility-related, poor neonatal resuscitation practices, lack of equipment and resources to handle neonatal emergencies and extremely premature neonates and iv). Community-related, cultural beliefs and practices [2-9]. Almost all articles, studies and reports came up with similar or same risk factors though not maternal age specific. According to Abdullah, *et al*. [10], their study in Indonesia reported six main factors associated with higher risk of neonatal deaths; neonatal complications during birth, neonatal infections, maternal lack of knowledge of neonatal danger signs, low apgar scores, home births and maternal antenatal complications. Birju & James [11] in their study indicated that neonatal sepsis immensely contributed to neonatal morbidity and mortality, especially among neonates with extreme low birth weight. According to Hibetu, *et al*. [12], the major determinants of neonatal morbidity and mortality were lack of knowledge, low level of education, traditional and cultural influence, inaccessible and poor health facilities.

In Africa, neonatal morbidity and mortality has been associated with similar risk factors as those identified by WHO and other researchers. In addition, poor maternal health during pregnancy, poverty, lack of information, neonatal infections, low education levels and stigma among others have been implicated [13]. Neonatal care practices cut across all African countries with minimal differences. A study in Malawi reported the same risk factors as indicated above [13] and in addition blamed the high incidences of neonatal infections due to ignorance. In Tanzania, a study conducted by UNICEF [14] indicated that the high neonatal mortality rate was attributed to the same risk factors mentioned above and in addition maternal co-morbidities, lack of knowledge and poor neonatal care practices and health seeking behaviors were implicated [15]. Studies in Uganda reported similar risk factors and in addition, poverty, lack of knowledge, high

prevalence of malaria, low education standards, household food insecurity, poor infrastructure, inability/delays to access health care were cited as key factors [16]. This was echoed in reports by WHO 2017, 2018.

In Kenya, neonatal mortality rate among mothers aged below 20 years was 27 vs 21 in the above 20 age group in 2014 [17] compared to national rate of 22. Of these, two-thirds occurred during the first seven days of life [18] mostly due to prematurity and sepsis. Furthermore, socioeconomic factors, cultural beliefs and traditions, lack of knowledge, low education standards, community laxity and household food insecurity, inability to access health care, harsh parents or guardians, poor infrastructure were cited as key factors that played a major role in neonatal morbidity and mortality. This ranked Kenya 143/172 of the countries that have made efforts to reduce neonatal mortality and mortality [20].

In Busia County, the risk factors included all of the above plus mothers abandoning and /or neglecting their neonates. Neonates were cared for by the adolescent's grandmothers or otherwise terminated their pregnancies in the late 2nd or early 3rd trimesters leading to premature births. The other factors were community instigated as communities did not value neonatal health [21] and as such did not or delayed to seek medical help. First line treatment of choice for the ill neonate was tradition-oriented. This caused toxicity and probable substance poisoning to the neonates leading to death. The poor infrastructure, births by unskilled care providers and the poor environmental hygiene were all implicated. Low levels of education, inadequate knowledge and poor social support systems have also been attributed to increased neonatal morbidity and mortality [22].

METHODS

The study was carried out at Busia County Referral Hospital in Western Kenya. The prevalence of neonatal morbidity and mortality was 58% at the start of the study for the adolescent mothers for the past three years as per the demographic survey reports against 33% in the general population.

Study Design

A cross-sectional interventional study design was employed because of the nature of the research. Study population comprised expectant mothers attending antenatal clinic at Busia County Referral Hospital. Target Population comprised expectant adolescent mothers aged 19 years and below, attending the antenatal clinic at BCRH.

Sampling Technique

Simple random with replacement

Inclusion Criteria

For a respondent to be included in this study, she must be aged 19 years or below, be expectant at a gestation of 26-34 weeks and a resident of Busia County.

Exclusion Criteria

The respondents who did not meet the above set criteria were not selected. Additionally, adolescent expectant mothers with chronic co-morbidities on regular medication, students and/or non-Kenyans were excluded.

Sampling Procedure

The technique was based on a single sequence of random assignment since all respondents had an equal chance of participating in the study. A total of 264 expectant adolescent mothers were recruited but reduced to 226 after data cleaning as some questionnaires had errors.

Materials: The questionnaire was semi-structured developed by the researcher and verified by the statistician. It was fairly easy and short, taking approximately 5-8 minutes. The questionnaires were administered to the selected respondents every day for fifteen (15) days at a rate of 15 respondents per day. The respondents were divided into groups of twenty members based on gestation period and led through guided health education sessions by the researcher. The researcher taught the selected topics after which, the respondents were allowed to share experiences. This promoted ownership of the issues hence the desire to counteract them in their own possible ways. The respondents were followed up individually with the assistance of community health volunteers to ensure what was discussed during the health education sessions was being practiced.

Implementation of the Intervention

The health education sessions were carried out at the hospital. Each session took at most one and half hours including routine antenatal checkup. The topics taught included; importance of antenatal care, danger signs, nutrition, personal hygiene, exercises, birth preparedness and complication readiness. Labour: signs of true labour, when to seek medical help and childbirth. Post childbirth: care of the neonate, exclusive breast feeding, baby immunizations, decision making skills, problem ownership, solving skills and coping mechanisms.

Procedure of intervention implementation

Topic: Risk factors associated with neonatal morbidity and mortality among neonates born to adolescent mothers in Busia County Referral Hospital

Lesson objectives: i). Identify and explain the risk factors. ii). Describe the mitigation measures.

Variables addressed

- **Predisposing factors:**
Characteristics that affect behavior and ability in decision-making; knowledge, cultural beliefs, maternal comorbidities, genetics, place of birth, skilled service provision, values and attitudes.
- **Reinforcing factors:** rewards or punishments meant to modify the behavior of the adolescent mothers, promote self-reliant skills and positive coping mechanisms.
- **Enabling factors:** resources required to reduce neonatal morbidity and mortality; identify programs supporting neonatal health, immunizations, health education, availability of and accessibility to resources, finances and regular checkups.

Teaching aids: posters, flip charts

Method of teaching: interactive

The researcher explained the terminologies described above in relation to neonatal morbidity and mortality and asked the respondents to list at least 3 factors in each category while demonstrating understanding of the factors listed.

Evaluation: question and answer session, clarifications, respondents' understanding of the topic.

Plan of action: Respondents to identify more factors from parents or guardians and categorize them starting with the most pressing factors that require immediate actions and solutions and share with group members in the following session

During experience sharing regarding danger signs in pregnancy, more than half of the respondents gave similar views, noting that the information they received from the health care providers was inadequate and that most times it was assumed that the adolescent mothers knew. *"Have you been taught these things? They are not new"* a health care provider would ask. The respondents felt they needed to be understood and be explained well so as to understand. *"During the visit, my book was taken and tickled. I did not know what the ticks were for."* One respondent said. This was echoed by several others who said that they just carried the books because they were told to do so each time they came to the clinic. *"The nurses mentioned many things: headache, stomach pains, bleeding and pain in the legs among others but they did not tell us the effects and what to do before reaching the hospital"*. They respondents complained.

On maternal nutrition, the respondents said that they were told to use eggs, liver and fruits but they were not explained the reasons. Never the less, they did not eat them because they could not afford. *"From whom shall we borrow money and yet we are being chased away from home? So we ate what was available. The respondents reported that they would be issued with medicines but no explanations, so many of them ever used to take them because they gave them abdominal upset.*

The respondents also reported that unlike this method, in the clinic, all the teaching was done once only on first visit, such that they could hardly comprehend. As a result, they could boycott the sessions. In any case, they said that they were never comfortable sitting with older mothers. They said that sometimes something were done publicly yet they carried stigma. eg 'calling one's name to be tested HIV' so they could not come the following visit.

With regard to birth preparedness and complication readiness, they were never explained how, except buying baby clothes that some ladies were selling at the hospital of which some people could not afford. *"Ensure you buy baby's clothes"* They would be told. Yet this was against some cultures to buy baby's clothes before the baby was born. On cord care, one respondent said, *"It was so scaring for me. For the two babies I have had, my mother-in-law has been washing them and recoting the cord. I know nothing"*. Others said that they had been given or asked to buy methylated spirit to clean with. However, a few found it ok to leave the task to their mothers and grandmothers. But in these sessions, they were explained how to manage the cord using chlorhexidine or clean tap water and the effects of poor cord care.

They reported having been told about exclusive breastfeeding for six months but the information collected from their friends indicated that nobody followed up to see if it was done. So, some mothers went ahead and gave porridge or cow's milk because the babies were crying of hunger. They also said that it was hard for girls going back to school because even if they expressed the milk, there was no place to keep. During the sessions, the respondents were explained how to express the milk and preserve using the locally available means but they were also advised to explore other possible options depending on set up.

Concerning social support system, they said this *'some of our parents are too harsh on us, sometimes getting pregnant is accidental, yet they treat it as an outcast. They don't understand, so they chase us away and yet they know that there is nowhere else we can go'. We are therefore forced to live in bad places. So, babies are born in dirty places. Some babies fall sick and die while some girls flush out.*

The question of abandoning babies was discussed at length but all depended on how one would be treated after giving birth but the agreement was that the mothers would take care of their babies. The mothers were explained the importance of motherhood, bonding and their effects on the growth and development of the neonate. However, the challenge would be how to take care of them in the wake of unemployment and poverty but they were encouraged to think of simpler ways of making ends meet.

When it came to neonatal care practices and neonatal health seeking behaviors, the decisions were all taken by older mothers and fathers. The adolescent mothers had no place or say. The researcher explained the pros and cons of the actions as leading to negligence and lack of parental responsibilities. After sharing experiences from subsequent mothers, the first timer mothers realized the need to take responsibility instead of shifting it to grandmothers. At this juncture, neonatal danger signs were explained and how to identify and manage them. The mothers were explained the importance of vaccines and encouraged to have their babies immunized as soon as they were born. They were also explained the possible danger of giving birth at home and therefore encouraged having their babies in a health facility.

Evaluation of the effectiveness of the health education intervention

At two and four weeks after childbirth, each adolescent mother who participated in the study was asked to bring her baby for checkup for any emerging issues. At this time, the mothers were also assessed for coping mechanisms. Those with issues once identified were helped by the researcher or the counselor to navigate around the issue and solve it. Most mothers had this to say about the intervention:

- That it was an 'eye -opener' to information they did not know.
- That the separation from older mothers helped them to open up and share with the peers. *'I wish there would be such a clinic where we are attended to separately'*. One of them said.

Those who gave birth at home and were followed up by the community health volunteers appreciated the service and promised to sensitize others. Each mother was asked to rate the intervention strategy on a 0-10 scale with 0 being no score and 10 the highest score. Eighty-five percent (85%) of the respondents gave a score of above 5/10 while 15% gave a score of less than 5/10. The overall consensus was that it was worthy trying it in other hospitals because it would help the adolescent mothers and save the neonates.

RESULTS

Demographic Finding:



Fig-1: Respondents' age

From figure 1, 97.8% of the respondents were aged between 16-19 years while only 2.2% were aged less than 15 years.

Table-1: Illustrates the risk factors implicated in neonatal morbidity and mortality

Variable	Measure	Responses		P-
		No	Yes	
Maternal separation/abandoned neonates	Frequency	119	107	
	%	32.7	47.3	0.373
Maternal infections	Frequency	174	32	
	%	77.0	23.0	0.422
Non breast feeding	Frequency	45	181	
	%	19.9	80.1	0.000
Low birth weight	Frequency	80	146	
	%	35.4	64.6	0.004
Prematurity	Frequency	74	152	
	%	32.7	67.3	0.001
Neonatal infections	Frequency	81	143	
	%	35.8	64.2	0.004
Poor environmental sanitation	Frequency	120	106	
	%	33.1	46.9	0.004
multiple pregnancy and births	Frequency	76	150	
	%	33.6	66.4	0.004
Difficult childbirth/Birth complications/trauma	Frequency	96	130	
	%	42.5	57.5	0.003
Congenital malformations	Frequency	170	36	
	%	75.2	24.8	0.345
Traditional beliefs and practices	Frequency	63	163	
	%	27.9	72.1	0.001
Poor maternal nutrition	Frequency	198	28	
	%	87.6	12.4	0.627
Low socioeconomic status	Frequency	104	122	
	%	46.0	54.0	0.006
Lack of knowledge to recognize an ill neonate among the mothers	Frequency	97	129	
	%	42.9	57.1	0.005
Delay to reach health facility	Frequency	74	152	
	%	32.7	67.3	0.000
Poor hygienic conditions for childbirth	Frequency	74	152	
	%	32.7	67.3	0.000
Poor social support systems	Frequency	99	127	
	%	43.8	56.2	0.005
Lack of knowledge on identification of ill neonates at community level	Frequency	102	124	
	%	45.1	54.9	0.056
Lack of emphasis on the care of neonates	Frequency	32	174	
	%	23.0	77.0	0.000
Delays in seeking medical assistance at community level	Frequency	79	147	
	%	35.0	65.0	0.002
Cultural beliefs, traditions and practices	Frequency	101	125	
	%	44.7	55.3	0.003
High prevalence of neonatal infection at community level	Frequency	92	134	
	%	40.7	59.3	0.005
Poor infrastructure	Frequency	37	189	
	%	16.4	83.6	0.000
Community does not value neonatal health	Frequency	32	174	
	%	23.0	77.0	0.000
Inaccessible health facilities at community levels	Frequency	23	203	
	%	10.2	89.8	0.000
Preference to traditional birth attendants	Frequency	186	40	
	%	82.3	17.7	0.65
Negligence	Frequency	43	183	
	%	19.0	81.0	0.000

DISCUSSION

According to the findings of this study, most of the adolescent mothers were aged between 16 and 19 years with most of them married. This concurred with a study by Omsdi [23], in which it was reported that adolescent mothers aged 15-18 years were more likely to conceive and get married compared to their counterparts above 19 years. According to UNICEF [24], 23% of young mothers gave birth by age 18 and that the neonatal death rate in this age group remained 27% for the under 20 years as compared to 21% among mothers aged above 20 years. This meant that the adolescent mothers were at 1.3 times higher risk of losing their neonates.

The low socio-economic status coupled with ill-equipped knowledge to care for the neonate and unemployment contributed greatly to neonatal morbidity and mortality as the adolescent mothers were unable to support self and the neonates. This was supported by a study carried out in Malawi in which it was found that most adolescent mothers were unable to meet the needs of their babies [25, 26].

A variety of risk factors to adolescent neonatal morbidity and mortality were addressed in details in this study. The glaring ones included; Inaccessible health facilities at community levels as reported by 89.8% (p<0.000) respondents. This was addressed also in a report by WHO [1] on 'reaching every newborn national 2020 milestones' in which every country was challenged to work out modalities of improving accessibility to health facilities. Consequently, community involvement and neonatal quality care practices could not be underestimated. Negligence was named as the second cause of neonatal morbidity and mortality in Busia at 81%, (p<0.000). The adolescent mothers abandoned their babies or left them under the care of their old grandmothers. These grandmothers fed these neonates on anything in form of liquid. This led to malnutrition and subsequent deaths. Non-breast feeding was echoed by 80.1%, (p<0.000) of the respondents as a major cause of neonatal deaths in Busia. Mari *et al*. [27] agrees with this finding. In their study, they found out that babies who were partially breastfed were at the risk of mortality three times higher than the breastfed ones while those who never breastfed were at a 14-fold higher risk of dying. Therefore, there was need to educate the adolescent mothers on the importance of early initiation and exclusive breastfeeding. Similarly, in an article by Dr. Nigel Rollins of WHO, it was noted that non-breastfed babies stood a higher risk of dying or even developing infection [28]. Cristiano *et al*. [29] is also in agreement by reporting that, countries with the lowest breastfeeding practices are at higher risk of neonatal mortality rates.

Lack of emphasis on the care of neonates by the social structure coupled with poor social support system was a major concern for neonatal deaths. This was reported by 77% (p<0.000) respondents. This is reflected in an article by Nigel Collins [28] in which he was concerned about the threat by Poor government policies, lack of community support for the mothers and of course the formula milk preparations that seemed to replace breastfeeding.

Still, this study found out that the level of education did not make any significant difference as a risk factor to neonatal mortality. This contrasts the information by UNICEF on maternal and newborn health disparities in Kenya [25] in which statistics showed that, neonatal mortality rate was higher among mothers with higher education levels as compared to those with no education at all; 25:21.

Generally, one would agree with Gitobu *et al*. [17] who concluded that neonatal mortality still remains a problem even with free maternal health care provision whose goal was to reduce pregnancy and childbirth related neonatal deaths. It was interesting to listen to the adolescent mothers airing their views, concerns, sentiments and dilemmas freely to each other. The suggestions of how they would like to be handled left no doubt but desire to change the mode of antenatal care. Probably this would reduce teen pregnancy and subsequent neonatal morbidity and mortality. These findings agree with those in a study carried out by Farzaneh *et al*. [30] on the effectiveness of group counseling and health education to antenatal adolescent mothers, where it was reported that women of different ages wished to be attended to separately in view of their unique needs. Further still, age-specific antenatal care proved very vital. In Kenya and by extension Busia, many strategies to reduce neonatal morbidity and mortality have been developed but apparently do not consider the unique needs of the adolescent mothers separately. This still left the adolescent mothers at a high risk of losing their neonates.

CONCLUSION

In conclusion, this study found out that neonatal morbidity and mortality among neonates born to adolescent mothers in Busia County Referral Hospital were influenced by multiple risk factors including but not limited to poor social support system, non-breast feeding, poor infrastructure and inaccessibility to health facilities, cultural beliefs and practices and negligence.

It is also very clear that the poor infrastructure played a major role in neonatal mortality as many adolescent mothers would not access the health facilities. Same to negligence, where the mothers abandoned their babies or left

them under the care of their old grandmothers probably under pressure or in desperation. Overall, the neonatal morbidity and mortality remains high.

RECOMMENDATION

The adolescent mothers need space and age-specific care tailored to their needs and therefore the need to step-up and intensify the health education strategies for the adolescent mothers and the community. There is need for the individual adolescents, the health care provider and the community to harmonize the neonatal care practices tailored to adolescence level of understanding.

Study limitations: Inaccurate record keeping, limited finances,

Competing interests: – The author has no competing interests. The content in this study is the author’s original research work.

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Consent for publication

Individual data was not presented therefore not applicable

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