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Edith Wamuyu Ndwiga, Margaret Keraka and Maurice Onditi Kodhiambo

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IMPLEMENTATION OF PRETERM BIRTH INTERVENTIONS BY NURSE MIDWIVES DURING PROVISION OF INTRAPARTUM AND PERINATAL CARE IN EMBU COUNTY, KENYA

[1*]Edith Wamuyu Ndwiga
[1]Post Graduate Student: Kenyatta University
*Corresponding Author's E-mail: wamuyuedith@yahoo.com
[2]Margaret Keraka
School of Public Health and Applied Sciences, Kenyatta University
Corresponding Author's E-mail: margaretkeraka@ku.ac.ke
[3]Maurice Onditi Kodhiambo
School of Pharmacy, Kenyatta University
Corresponding Author's E-mail: mauricekodhiambo@ku.ac.ke

Abstract

Purpose: The purpose of the study was to investigate implementation of preterm birth interventions by Nurse Midwives during provision of intrapartum and perinatal care in Embu County, Kenya.

Methodology: The study used descriptive cross-sectional design. 24 client's files (quarter of the sample size) were reviewed to ascertain implementation. 94 respondents were randomly sampled and self- administered questionnaires, document review guide and key informant guide were used to collect data. Data was analyzed by use of SPSS, descriptive statistics, chi squire and Fisher's exact test and binary logistic model. Findings were presented using tables and charts.

Results: The study results revealed that there is a statistically significant association between, type of PTBI, survival rate of babies exposed to preterm birth interventions (PTBI) and proportion of nurse midwives implementing PTBI and the implementation of PTBI. However, the study concluded that implementation of PTBI is low at (52.7%) in Embu County, Kenya.

Unique contribution to theory, practice and policy: In light of the research findings, the study recommends the county government of Embu and the hospital management to consider maternity waiting homes which can help bridge the gap between home and facility care especially for women who live far away from the healthcare facilities and presents with preterm birth interventions (PTB). Skilled care is also recommended to ensure an effective continuum of care from home to facility. The government is also recommended to invest in the training and induction of more nurses in the field of PTBI.

Keywords: *Implementation, Preterm birth interventions, Intrapartum and perinatal care.*

1.0 INTRODUCTION

Preventive birth interventions (PTBI) are basic and specialized package designed to improve preterm birth outcome (PTBO) hence increase the survival of babies born preterm. Survival rates of preterm birth (PTB) increases with advancement of gestational age. According to World Health Organization WHO (2015), the chance of survival at less than 23 weeks is close to zero and ranges between (19%) at 23 weeks to 95 % at 29 weeks. Globally PTB leads in causing neonatal mortality rate (NMR) and child mortality rates (CMR). It accounts for one million deaths yearly and a risk factor to over 50% of all global neonatal deaths (NND) (Blencowe *et al.*, 2013). In 2015 NND accounted for 45% of under-fives deaths with prematurity contributing 16% (WHO, 2015). 70% of these deaths occur in Africa and South- East Africa. In Sub- Saharan Africa (SSA), 25% of neonates die yearly due to complications arising from PTBO. A baby born preterm in SSA is 13 times at risk of dying than a full term baby (Afolabi, 2017).

In Kenya, 12.5% are born preterm and 7.4% of children die annually due to complications arising from PTBO. Embu County registered, (2.5%) of PTB and (1.6%) of NND of which almost 50% of these deaths were attributed to prematurity (MOH, 2015). The study hospitals, Embu Teaching and Referral Hospital (ETRH), Ishiara Sub-county and Mbeere Sub-county contributed a proportion of 68.2% (193 out of 280 PTB), higher than Kitui County (54.9%) and (54.6%) of NND of which almost 50% is attributed to PTBO (MOH, 2015). 80% of these deaths are preventable through low cost interventions that are scientifically proven effective (MOH, 2014).The PTBO poses serious health problems to the survivors. Survivors experiences difficult breathing, feeding difficulties, cerebral palsy, vision problems, hearing impairment ,cognitive and learning disabilities, behavioral, developmental delays, social- emotional health problems as well as brings about economic costs to the family and have implications such as health insurance, educational, and other support systems (CDC, 2015) and leads to productivity loss. In US medical, educational and loss of productivity associated with PTB outcome were more than 26.2 billion US dollars (WHO, 2013).

Globally, uptake of PTBI will reduce over 1 million out of 6 million child deaths occurring globally, due to complications of PTBO hence achieve SDGs 3 which calls for ‘’an end’’ to avert child and neonatal deaths by vision 2030 (Yarney, 2016) WHO recommends 10 elements in PTBI namely; antenatal care (ANC) corticosteroids, Tocolytics , magnesium sulphate; Kangaroo mother care (KMC), and surfactant antibiotic prophylaxis, mode of delivery PTB and, plastic wraps, continuous positive airway pressure therapy, and oxygen therapy for the newborn. However, the researcher intends to study implementation of PTBI during intrapartum and perinatal periods namely; ANC corticosteroids, Tocolytics, resuscitation, provision of warmth through Kangaroo mother care (KMC) and antibiotic prophylaxis (USAID, 2014).

Despite the interventions being in place the uptake of PTBI is low in middle and low income countries (Yarney, 2016), this is reaffirmed in an evidence based clinical uptake of PTBI during intrapartum period in a multicounty study in 18 WHO priority countries with Kenya included. Implementation of PTBI will help Kenya to achieve its target of reducing NMR to 18 percent by 2020, realization of vision 2030, the constitution of Kenya 2010, and Sustainable Development Goals (SDGs) 3 (Reproductive Maternal Neonatal Child and Adolescent Health) (RMNCAH)

Investment Framework (2016). Nurse midwives play a key role in the implementation of PTBI since they are wholly involved in provision of PTBI to women at primary, secondary and in tertiary levels. They are also key people in implementing policies, protocols and following the set standards in implementation of PTBI while the leadership/ management is involved in providing an enabling environment for the implementation of the same, monitoring and evaluation to ensure implementation of PTBI. Therefore the study is worth undertaking. The aim of the study was to investigate implementation of preterm birth interventions by nurse midwives during provision of intrapartum and perinatal care in Embu County, Kenya.

1.1 Statement of the Problem

Globally, despite the preterm birth interventions to reduce risk of PTBO hence increasing the survival of preterm babies, the coverage rates of the uptake in low and middle income countries remain very low (Yarney *et al.,* 2016). Consequently, worldwide neonatal deaths accounts for 45% of under-fives deaths, with prematurity contributing 16% (WHO, 2015). Efforts to reduce these deaths remain futile since the rate of decline of childhood deaths related to prematurity remains low at 2.1% as compared to overall childhood deaths of annual average rate reduction of 4.1% per 1000 live births (WHO, 2015). PTB adversely affects the baby's survival and long term health (Hoh, Pallavi, Takeda & Kim, 2019). It not only has health implications but also has social-economic implications as seen in US where 26.2 US billion dollars were spent on medical, education interventions in addition to productivity loss (Beck *et al.,* 2010) This makes it an important issue in Public health.

Similarly in Kenya despite the PTBI, strategies and policies put in place, the country continues to experience worrying figures on rising of PTB (MOH, 2014) consequently, leading to adverse effects on survivors and limiting chances of survival of preterm babies. In Embu county, PTB increased by 24.6% in 2016 (CHIS, 2016) exposing survivors to life threatening health problems and death. Study hospital (ERTH, Ishiara Sub-County and Mbeere Sub-County hospitals) contributed 54.6 % of neonatal deaths in the county of which 50% was attributed to prematurity. In Kenya and specifically Embu county there is scanty information and literature on PTBI. Uptake of PTBI may be enhanced, hindered or distorted by various factors. Thus, the study was worth undertaking to investigate the uptake of PTBI among health care providers in Embu County. Specifically the study aimed at determining proportion of HCP implementing uptake of PTBI during intrapartum and Perinatal periods, to establish the influence of social- demographic characteristics, training related to PTBI, health facility factors (HFF) on the uptake of PTBI among health care providers in Embu County.

1.2 Objective of the Study

The study sought to investigate implementation of preterm birth interventions by Nurse Midwives during provision of intrapartum and perinatal care in Embu County, Kenya.

2.0 LITERATURE REVIEW

Implementation of uptake of PTBI is the process by which the HCP executes prescribed interventions to women with imminent PTB and immediate care to neonates during intrapartum and perinatal periods respectively. The burden of PTB is substantial for many developing

countries, and scale up of some low- tech, cost-effective interventions can help to reduce newborn deaths from prematurity. Reducing the burden of PTB has two main elements: prevention and care (Lawn *et al.*, 2012). Interventions to manage preterm labor aim at reducing serious complications arising from PTB. These interventions include medications called Tocolytics to slow down labor, antenatal corticosteroids to help the fetus survive PTB, and antibiotics to prevent infection when preterm pre-labour rupture of membranes (pPROM) occurs while care involves neonatal resuscitation and Kangaroo mother care (Lawn *et al.*, 2012).

2.1 PTBI-Tocolytics

These are drugs that inhibit uterine contractions and suppress pre-term labor (PTL) (pregnant women in labor with cervical dilatation). They are effective for up to 48 hours and may prolong pregnancy for up to 7 days. Tocolytics agents are an important intervention in obstetrics, though they have not been shown to improve neonatal outcomes (WHO, 2015), the drugs are administered to symptomatic women when PTB is inevitable, to maintain the pregnancy for at least 48 hours to enable administration of antenatal corticosteroids, or provides an opportunity for the mother to be transported to a tertiary care facility with specialized neonatal facilities. Without interventions PTL ends up to PTB.

Lipi, Begum, Alam, Jahan, Rahman and Rumana (2013) reports that, PTL with its complications is the leading cause of perinatal mortality and morbidity, specially respiratory distress syndrome, intra-ventricular hemorrhage, broncho-pulmonary dysplasia, necrotizing enter colitis etc. It is related to socioeconomic status, disease pattern, genetic consultation and geographic location. In his prospective study at Mitford hospital in Dhaka on magnesium sulphate use as a Tocolytics agent, he stipulates that with administration of Tocolytics to women with PTL, in some intuitions the fetal survival rate approaches 90% at 24-27 weeks of gestation and 98% at 28-31 weeks of gestation.

2.2 ANC Corticosteroids (ACS)

ANC Corticosteroids (ACS) is a drug given to pregnant women presenting with PTL or at risk for PTB. It triggers production of surfactant (a protein substance that enhances lung maturation) hence prevents respiratory distress (RDS).Thus improving PTBO. When given to mothers in PTL, ACS (dexamethasone) helps speed up the development of the baby's lungs. At a cost of about US $1, two shots can stop premature babies from going into respiratory distress when they are born (Lawn *et al*., 2012). ACS therapy is recommended for women at risk of PTB from 24 weeks to 34 weeks of gestation when the following conditions are met: gestational age assessment can be accurately undertaken; PTB is considered imminent; there is no clinical evidence of maternal infection; adequate childbirth care is available (including the capacity to recognize and safely manage preterm labor and birth); and the preterm newborn can receive adequate care if needed (including resuscitation, thermal care, feeding support, infection treatment and safe oxygen use (WHO guidelines, 2015) ACS are known to prevent 40 percent of neonatal deaths occurring globally. According to WHO (2015) studies indicate that ACS prevents nearly 400, 000 neonatal deaths annually. A report from a retrospective study by Kiatsuda (2016) among 103 singleton pregnant women administered Tocolytics to prevent PTB, more than 80% of the included women received complete course of ACS thus minimizing complications arising from PTB.

2.3 Antibiotics prophylaxis

Antibiotics prophylaxis in PTB is given to women with preterm premature rupture of membranes (PPROM) to help prevent infections hence reduce complications arising from pre-term delivery and post-natal infection in high-income settings. There is moderate quality evidence that, in low-income settings, where access to other interventions namely; antenatal steroids, surfactant therapy, ventilation and antibiotic therapy may be low, antibiotics for pPROM could prevent 4% of neonatal deaths arising from complications of prematurity and 8% of those occurring due to infection (Mensal *et al.*, 2017). According to Martinelli *et al.* (2009) antibiotic prophylaxis given during the second and third trimesters of pregnancy may prevent or treat infections occurring due to pathogenic bacteria that are common inhabitants of the vagina likely to cause infections such as cervicitis, chorioamnionitis, and intra-amniotic infection during pregnancy and hence reduce the risk of PTL or PROM when given routinely to pregnant women.

2.4 Newborn resuscitation

This is a procedure implemented by the HCP in an emergency where the life of an infant is at risk of death. The infant presents with signs of inability to establish breathing, cyanosis, poor or non-response and floppiness. HCP ensures ABC (clear airway, breathing and circulation) by applying basic resuscitation through suctioning; chest compression to stimulate heart beats, use of a bag-and-mask (ventilation) and administration of oxygen. WHO (2014) stipulates that through use of a bag-and-mask or mouth-to-mask will save 4 out of every 5 babies who need basic resuscitation. The purpose of neonatal resuscitation is to help the newborn to establish spontaneous breathing and facilitate oxygen delivery to its organs and tissues especially the brain, which is very quickly damaged by oxygen shortage.

Lawn *et al.* (2014) stipulates that immediate cause of many of the world's 2.8 million annual neonatal deaths is an illness presenting as an emergency, either soon after birth (such as complications of PTB and intrapartum hypoxia) leading to birth asphyxia. Birth asphyxia contributes to 19% of the 4 million neonatal deaths worldwide every year and approximately 280,000 babies die of birth asphyxia soon after birth. In addition to its contribution to mortality, birth asphyxia can result in cognitive impairment, epilepsy, cerebral palsy, and chronic diseases in later life Bansal *et al.* (2014). Thus, World Health Organization recommends newborn resuscitation and treatment of asphyxiated infants.

2.5 Kangaroo Mother Care (KMC)

KMC is an example of innovative and cost-effective intervention to reduce premature mortality, developed in Colombia. KMC is of two types; continuous and intermittent. Continuous KMC is defined as the practice of skin- to-skin care continuously throughout the day without breaking the contact between mother and baby, while intermittent KMC is the practice of skin-to- skin care alternated with the use of either a radiant warmer or an incubator care for the baby (WHO, 2015). The preterm baby is put in early, prolonged, and continuous direct skin-to-skin contact with her mother or another family member.

KMC is associated with significant reductions in neonatal mortality, infections and hypothermia for stable babies weighing less than 2 kg if started in the first week. KMC enhances increased

breastfeeding, weight gain, and mother - baby bonding. It is parent- baby- and health system-friendly, as it reduces hospital staying. In addition, Lawn *et al*. (2012) stipulates that KMC helps regulate the body temperature, facilitates breastfeeding, helps brain growth and development and can prevent 450,000 deaths annually. Regretfully, it is underutilized, despite the sound evidence for its effectiveness (WHO, 2014). The Cochrane review summarized data on effectiveness by subgroups of studies that had used either continuous or intermittent KMC (WHO, 2015) reported that continuous KMC was associated with a 40% lower risk of mortality at the time of discharge or at 40–41 weeks postmenstrual age and 33% reduction in the risk of mortality at the latest follow-up contact. However the studies do not indicate the number of times KMC was utilized.

3.0 METHODOLOGY

The researcher adopted descriptive cross-sectional survey design to collect both qualitative and quantitative data. The study was carried out in three hospitals (one County teaching and referral hospital and 2 sub-county hospitals) in Embu County, Kenya. The study used purposeful sampling to identify the 3 hospitals, 5 Key informants and 24 client files. Simple random sampling was used to identify 94 participants (nurse midwives) from the target population of 108 nurse midwives providing intrapartum and perinatal care to pregnant women and newborn babies in maternity unit. Self-administered questionnaires, Key informant interview guides and document review guides were used to collect data. Three assistants knowledgeable in midwifery participated in the training to equip them with knowledge and skills necessary for data collection. Inclusion criteria was used to select the nurse midwives working in maternity unit and willing to consent while exclusion criteria was used to select the nurse midwives who were on night duty, on leave and those who have worked in the maternity unit for less than 3 months (since they work hand in hand with a senior nurse) since they work hand in hand with a senior nurse.

A Fisher *et al.* (1998) formula was used to arrive at an adequate sample size of 94 (Mugenda & Mugenda, 2003). The sample was then distributed as follows:

Table 1: Proportionate Allocation of Sample Size

Hospital	No. of Nurses Midwives in Maternity unit	Sample	Percentage
Embu Teaching and Referral Hospital (ETRH)	90	78	83
Ishiara Hospital	12	11	12
Mbeere Sub-County	6	5	5
Total	**108**	**94**	**100**

Before categorisation, the data collected was subjected to cleaning, entering and, coding in excel and then analyzed using SPSS version 21. The analysis was done using descriptive statistics, chi squire, Fisher exact test where cells were less than five and binary logistic analysis was conducted to find the relationship between variables hence draw conclusion on the hypothesis. Level of significance was set at $P<0.05$.

4.0 FINDINGS AND DISCUSSIONS

4.1 Types of PTBI Implemented in Embu County Hospitals

Likert scale was used to collect data from the responses. The response rate was n=93(98.99%). The nurse midwives who implemented three or more interventions were termed to have high implementation of PTBI, while those who implemented less than three interventions were termed to have low implementation.

The results indicated in the Table 2 below revealed that respondent's opinion on types of implementation of various PTBI in Embu County hospitals, majority of the respondents agreed with the statement that PTBI are administered to pregnant women and PTB babies accordingly. According to their opinion, highest implemented was antibiotic prophylaxis (91.49%) and resuscitation (90.42%) while least implemented was ANC corticosteroids (ACS) (64.90%). However the number of those who disagreed with the statement was insignificant as compared to those who agreed and those that remained neutral.

On a five-point scale, the average mean of the responses was 4.15 which mean that majority of the respondents agreed with the statements; however, the answers were varied from the mean as shown by a standard deviation of 1.03.

Table 2: Types of PTBI Implemented in Embu County Hospitals (n=93)

Statement	strongly disagree	Disagree	neutral	agree	strongly agree	Mean	Standard Deviation
Tocolytics to women with preterm birth (PTB)	3.19	6.38	8.51	32.98	48.94	4.18	1.05
Anti-biotic prophylaxis to women with PROM in PTB	1.06	3.19	4.26	35.11	56.38	4.43	0.81
ANC corticosteroids to women with PTB within 48 hours prior delivery	3.19	10.64	21.28	35.11	29.79	3.78	1.09
Resuscitation to premature babies	2.13	3.19	4.26	30.85	59.57	4.43	0.89
Kangaroo mother care (KMC)	8.51	7.45	17.02	18.09	48.94	3.91	1.32
Aggregate						**4.15**	**1.03**

4.2 Frequency of Administration of PTBI and the Number of Interventions Implemented

The results in Table 3 revealed that less than half of the respondents n=35 (37.6%) have administered PTBI more than 15 times in the last 1 year, while least number of respondents n=9

(9.6%) administered 11 to 15 times. In addition number n= 44 (47.3%) of the respondents implemented more than 3 interventions while n=49 (52.7%) administered less than 3 interventions.

Table 3: Frequency of Administration of PTBI and the Number Implemented

Frequency of Administration	Frequency	Percent	No. of interventions	Frequency	Percent
Less than 5 times	22	23.7	Implemented Less than 3	49	52.7
6-10 times	27	29.0			
11-15 times	9	9.7	Implemented More than 3	44	47.3
over 15 times	35	37.6			
N	**93**	**100**	**N**	**90**	**100**

4.3 Opinion on Survival Rates of Babies Exposed to PTBI.

The results in Figure 1 below revealed that highest number of the respondents n=53 (57%) rated the survival rates of prematurity babies exposed to PTBI at 40-80% while lowest n=7(7%) rated the survival rates to be less than 20%.

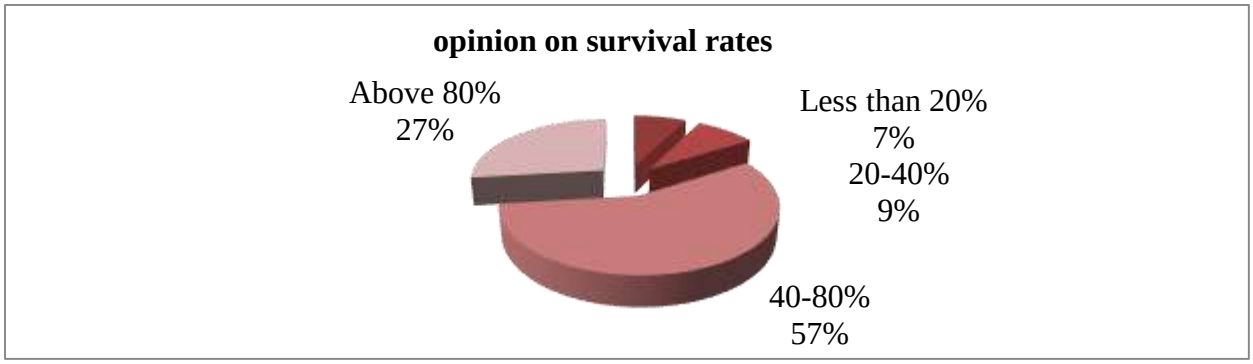

Figure 1: Opinion on Survival Rates of Babies exposed to PTBI n=93

4.4 Administration of PTBI from Medical Records and Survival Rates of Babies Exposed to PTBI (n=93)

The researcher also reviewed 24 client's files (quarter of the sample size) to ascertain PTBI uptake and survival rates of babies exposed to PTBI. It was found that out of 24 clients, 16 were administered with PTBI and out of the 16 PTB babies, 11 survived while 5 died. This was presented in Table 4.

Table 4: Administration of PTBI from Medical Records and Survival Rates of Babies Exposed to PTBI (n=93)

Administration of PTBI			Survival Rates		
Category	**Frequency**	**Percent**	**Category**	**Frequency**	**Percent**
Not administered	8	33.33	Survived	11	68.75
Administered with PTBI	16	66.75	Died	5	31.25
N	**24**	**100**	**N**	**16**	**100**

4.5 Proportion of Nurse Midwives involved in Implementation of PTBI

The results in Figure 2 below revealed that slightly more than one third of the respondents n=33 (35.5%) implemented resuscitation, as compared to other interventions of whom n=19 (57.6 %), 14(42.4%) were associated with low and high implementation of PTBI respectively. Least implemented was KMC of which n=1(33.3%) of nurse midwives were associated with low implementation while n=2(66.7%) had high implementation in the last one year. Highest n= 90 (96.8%) of nurse midwives did not implement KMC.

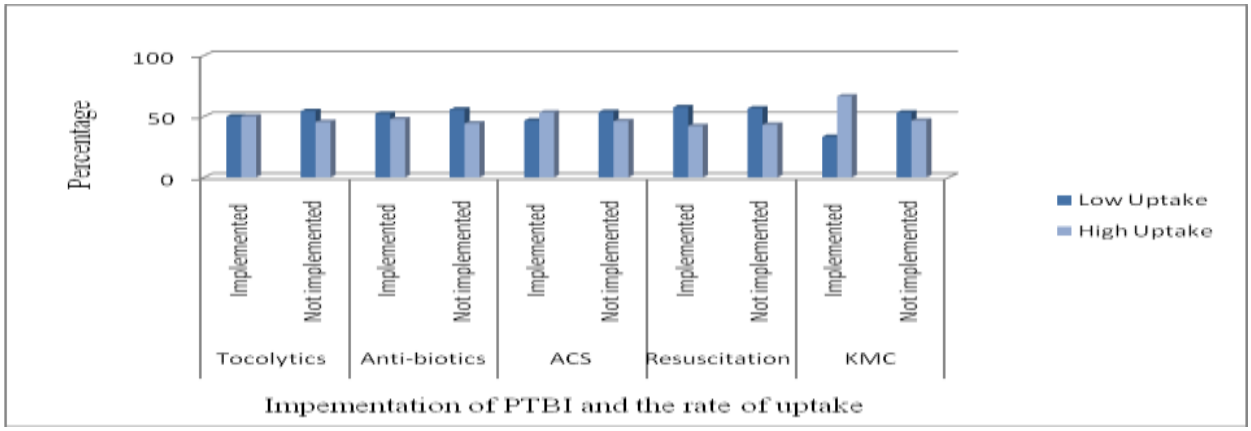

Figure 2: Proportion of Nurse Midwives involved in Implementation of PTBI (n=93)

4.6 Relationship between Proportion of Nurse Midwives involved in implementation of PTBI and the Implementation of PTBI.

The first categories of each variable were used as reference point. The results in the Table 5 below revealed that highest number (98%) of the nurse midwives agreed that PTBI were implemented in Embu County hospitals as compared to (2%) of those who disagreed. The study found a statistically significant association between PTBI implemented in the Hospitals {OR=14.903, (LL=0.733, UL=303.2, χ^2=1.342, P=0.047)}, proportion of HCP implementing PTBI (FET=114.717, p= 0.007), type of PTBI implemented (FET=1.509, p=0.001) and survival rates (FET =2.021, p= 0.011) all set at 0.05 level of significance. The key informants (KIIs) were asked to rate the levels of uptake of PTBI whether adequate or inadequate. All the 5 KIIs indicated that the "*implementation of PTBI was inadequate"*.

Table 5: Relationship between Proportions of Nurse Midwives involved in Implementation of PTBI and the implementation of PTBI.

Proportion of Nurse Midwives implementing PTBI		Implementation of PTBI		P value	OR	CI(Lower)	CI(Upper)	Statistical Significance
		Low uptake	High uptake					
PTBI implemented in the Hospitals	Disagree	0	2(6.2%)	0.000	1	1	1	(χ^2=2.404, p= 0.031)
	Agree	36(97.3%)	29(90.7%)	0.079	14.903	0.733	303.2	
	Neutral	1(2.7%)	1(3.1%)	0.003	0.625	0.183	2.131	
Proportion of Nurse Midwives implementing PTBI	Implemented equal or more than 3	27(55.1%)	24(54.5%)	0.000	1	1	1	(FET=114.717, p= 0.007)
	Implemented less than 3	20(40.8%)	19(43.2%)	0.006	0.936	0.406	2.156	
	None	2(4.1%)	1(2.3%)	0.047	0.526	0.044	6.293	
Type of PTBI implemented	Tocolytics	8(16.3%)	8(18.2%)	0.032	1	1	1	(FET=1.509, p= 0.001)
	Antibiotics	12(24.5%)	11(25%)	0.023	1.892	0.112	31.862	
	Corticosteroids	7(14.3%)	8(18.2%)	0.040	2.356	0.152	36.495	
	Resuscitation	19(38.8%)	14(31.8%)	0.021	2.166	0.125	37.687	
	KMC	1(2%)	2(4.5%)	0.045	1.748	0.118	25.872	
	None	2(4.1%)	1(2.3%)	0.003	4.568	0.13	160.515	
Extent of implementation	large extent	19(38.8%)	25(56.8%)	0.308	1	1	1	(FET =1857, p= 0.657)
	low extent	8(16.3%)	4(9.1%)	0.562	1.611	0.322	8.069	
	moderate extent	22(44.9%)	15(34.1%)	0.197	2.956	0.57	15.331	
Nurse Midwives opinion on survival rates	less than 10%	5(10.2%)	2(4.5%)	0.548	1	1	1	(FET =3.147, p= 0.210)
	11-20%	4(8.2%)	4(9.1%)	0.212	0.2	0.016	2.496	
	40-80%	29(59.2%)	24(54.5%)	0.778	1.299	0.211	8.002	
	above 80%	11(22.4%)	14(31.8%)	0.564	0.726	0.244	2.156	
Survival Rates	Survived	2(66.7%)	3(23.1%)	1	1	1	1	(FET =2.021, p= 0.011)
	Died	1(33.3%)	10(76.9%)	6.667	0.017	0.437	101.732	

The variable in this model (implementation of PTBI) explain 12.3% of the variation in dependent variable (Uptake of PTBI) which is represented by a Nagelkerke R Square of 0.123.

Table 6: Model summary of Bivariate Logistic Regression Analysis

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	118.255a	0.092	0.123

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The study sought to investigate implementation of preterm birth interventions (PTBI) by nurse midwives during provision of intrapartum and perinatal care in Embu County, Kenya. The study specifically sought to establish: types of PTBI implemented, survival rate of babies exposed to PTBI and the proportion of nurse midwives involved in implementation of (PTBI).

5.1.1 Types of Preterm Birth Interventions implemented

The results revealed that various PTBI have been implemented in Embu County according to WHO recommendations (2015). However, despite nurse midwives opinion on implementation of PTBI indicating high rates of implementation in various PTBI (antibiotic prophylaxis (91.49%), resuscitation (90.42%) and ACS (64.90%)), the results revealed low uptake of Tocolytics n= 16 (17.2%), ANC corticosteroids (ACS) n= 15 (16.1%) and KMC n=3 (3.2%) as compared to resuscitation n= 33 (35.5%) and ANC antibiotic prophylaxis n=23 (24.7%). KIIs also supported the results since they indicated that ‘’*the implementation of PTBI was inadequate”*. These findings were consistent with that of other studies by, Vogel *et al.* (2013), (WHO, 2015, 2016) and Melisa et.al. (2015) in addition the report correlates with that of WHO (2014) which stipulates that despite the sound evidence for KMC effectiveness it is regretfully, underutilized. The results are inconsistent with a study in India where out of 126 pediatricians, of Gujarat, India, 84 (66.7%) performed more than 20 resuscitation in 4 months (Bansal *et al.* 2014). The results also revealed that there was statistically significant association between type of PTBI and the implementation of PTBI (FET=1.509, p=0.001). This implies that type of PTBI influences the implementation of PTBI.

5.1.2 Survival rate of babies exposed to Preterm Birth Interventions

The results from medical records revealed high survival rates of babies exposed to PTBI 11 (68.75 %) as compared to those who died 5 (31.25%). The findings corresponded with nurses’ midwives opinion on survival rates whereby slightly less than two thirds (57%) indicated that survival rate of premature babies exposed to PTBI was between (40-80%). This implies that evidently, babies exposed to PTBI have increased chances of survival. The results were consistent with that of Wilson (2017) which reports that out of 62 births observed, (19%) of babies required resuscitation of which it was done leading to (100%) survival rate. Mensal *et al.* (2017) indicates that ANC antibiotics reduces (4%) of NND due to premature rupture of membranes (PROM) and (8%) due to infection. WHO (2014, 2015) indicates that ACS is known to prevent (40%) of NND globally and 400,000 NND annually, KMC prevents 450,000 NND annually and it has 40% of lower risk of mortality at the time of discharge, while newborn resuscitation saves 4 out of 5 babies who require basic resuscitation. However, despite their effectiveness in preventing complications arising from PTBO and deaths hence increasing survival rates of PTB babies, those nurse

midwives who reported that the survival rate was between (40-80 %,), 29(59.2%) were associated with low implementation of PTBI while 24(54.5%) were associated with high implementation these findings were consistent with those of WHO (2016), who weighed on the issue that despite their effectives in preventing complications arising from PTBO however, various studies report low uptake of PTBI. Other studies indicating low uptake of various PTBI are (Melisa *et al.*, 2015; Berrueta *et al.*, 2016).

5.1.3 Proportion of HCP involved in implementation of PTBI in Embu County

The results revealed that highest (98%) of the HCP agreed with the statement that PTBI were implemented in Embu County hospitals as compared to the least (2%) who disagreed. However, the findings revealed that despite high number of respondents agreeing that PTBI have been implemented in Embu County and the same ascertained in the medical records, the proportion of nurse midwives who implemented the interventions (52.7%) were associated with low uptake as compared to (47.3%) who were associated with high uptake.

The findings were consistent with Yarney *et al.* (2016) and Berrueta *et al.* (2016) who reported low uptake of PTBI in low and middle income countries. Kenya is rated as in the class of low income country. The study also revealed a statistically significant association between PTBI implemented in the Hospitals, and proportion of nurse midwives involved in implementation of PTBI. Hence proportion of nurse midwives involved in implementation of PTBI influences the uptake of PTBI.

5.2 Conclusion

Low uptake of various PTBI was revealed, with KMC being highly underutilized as compared to resuscitation, ANC antibiotics, ACS and Tocolytics. Results also revealed that various types of PTBI were significantly associated with implementation of PTBI. Thus type of PTBI influences implementation of PTBI. The results also revealed high survival rate of babies exposed to PTBI. This implies that PTBI is an effective intervention in reducing NND related to PTBO. The results further revealed that survival rate is significantly associated with implementation of PTBI.

The results revealed that high number of the respondents agreed that PTBI have been implemented in Embu County and the same was ascertained in the medical records, however, the proportion of nurse midwives associated with low implementation was high as compared to those who had high implementation during provision of intrapartum and perinatal care. Thus there was low uptake of PTBI in Embu County, Kenya in the last one year. In addition, the findings, revealed a statistically significant association between proportion of nurse midwives involved in implementation of PTBI and the implementation of PTBI. Hence proportion of nurse midwives implementing PTBI influences the implementation of PTBI.

5.3 Recommendations

The study recommends the county government of Embu and the hospital management to consider maternity waiting homes which can help bridge the gap between home and facility care especially for women who live far away from the healthcare facilities and presents with PTB. This will enhance close monitoring of pregnant women with PTB hence promote implementation and subsequent uptake of PTBI hence increase survival rates of PTB. This can as well be a better option

to help reduce stillbirths and neonatal deaths related to PTB. Skilled care is fundamental in ensuring an effective continuum of care from home to facility, emphasizing essential care for mothers and newborns and improving care-seeking behaviour for complications. Thus the County government and National governments should consider community based programs in midwifery /reproductive health sectors.

The government is also recommended to invest in the training and induction of more nurses in the field of PTBI. As well more avenues of updates including on job trainings should be considered to keep HCP more informed. This will ensure a constant supply of quality and experienced human resources to help reduce PTB thus reducing complications arising from PTB hence increase survival rates. Midwives as seen to be the majority of the personnel in the maternal unit should be trained on the new and advanced healthcare methods of handling PTB issues and regularly appraised on the job. The hospital management should also ensure that the training programs are evenly distributed among the staff accordingly.

REFERENCES

Bansal, S. C., Nimbalkar, A. S., Patel, D. V., Sethi, A. R., Phatak, A. G., & Nimbalkar, S. M. (2014). Current neonatal resuscitation practices among Paediatricians in Gujarat, India. *International journal of pediatrics*, *2014*.

Beck, S., Wojdyla, D., Say, L., Betran, A. P., Merialdi, M., Requejo, J. H. ... & Van Look, P. F. (2010). The worldwide incidence of preterm birth: a systematic review of maternal mortality and morbidity. *Bulletin of the World Health Organization*, *88*, 31-38.

Blencowe, H., Cousens, S., Chou, D., Oestergaard, M., Say, L., Moller, A. B. ... & Lawn, J. (2013). Born too soon: the global epidemiology of 15 million preterm births. *Reproductive health*, *10*(1), S2.

CDC. (2019). Centers for Disease Control (CDC) and Prevention. (n.d.).Preterm birth. Retrieved September 17, 2013. Available At: https://www.cdc.gov/

De Oliveira, J. C., Martinelli, M., Nishioka, S. A. D. O., Varejão, T., Uipe, D., Pedrosa, A. A. A. ... & Danik, S. B. (2009). Efficacy of antibiotic prophylaxis before the implantation of pacemakers and cardioverter-defibrillators: results of a large, prospective, randomized, double-blinded, placebo-controlled trial. *Circulation: Arrhythmia and Electrophysiology*, *2*(1), 29-34.

Hoh, J. K., Lappas, M., Liu, C., Qiao, C., Pallavi, K., Takeda, J., & Kim, Y. J. (2019). Preterm birth rate and dilemma of preterm labor treatment in Asia. *Placenta*.

Kiatsuda, D., Thinkhamrop, J., & Prasertcharoensuk, W. (2016). Success rate in preterm uterine contraction inhibition with tocolytic agents in a tertiary care center. *International journal of women's health*, *8*, 663.

Lipi, L. B., Begum, N., Alam, U. K., Jahan, R., Rahman, M. M., & Rumana, R. (2013). Study on role of magnesium Sulphate as a Tocolytic agent in preventing preterm labour. *Journal of Dhaka Medical College*, *22*(2), 179-184.

Ministry of Health (MOH). (2015/2016). *Vital Health Statistics. Embu, Embu County*. Retrieved From: https://www.healthpolicyproject.com/pubs/291/Embu%20County-FINAL.pdf

USAID (2015) Global Alliance to Prevent Prematurity and birth (PTB) and low birth weight (LBW) interventions in 24 priority ... Indonesia, Kenya, Liberia, Madagascar,

WHO. (2015). *WHO Recommendations on Interventions to Improve Preterm Birth Outcomes*. Geneva: Available At: https://apps.who.int/iris/bitstream/handle/10665/183037/9789241508988_eng.pd;jsessionid=27C0EE641F5F51570BB51D9E6FAD377F?sequence=1

Wilson, G. M., Ame, A. M., Khatib, M. M., Rende, E. K., Hartman, A. M., & Blood-Siegfried, J. (2017). Helping B abies B reathe implementation in Z anzibar, T anzania. *International journal of nursing practice*, *23*(4), e12561.

Yarney, L., Buabeng, T., Baidoo, D., & Bawole, J. N. (2016). Operationalization of the Ghanaian patients' charter in a peri-urban public hospital: voices of healthcare workers and patients. *International journal of health policy and management*, *5*(9), 525.