Second Delay Factors Influencing Perinatal Mortality among Mothers in Lurambi and Butere Sub-Counties, Kakamega County, Kenya

Catherine Mutonyi Simiyu, Mary Kipmerewo and John Arudo

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[1]Catherine Mutonyi Simiyu
Graduate Student: School of Nursing, Midwifery and Paramedical Sciences
Masinde Muliro University of Science and Technology, Kenya
Corresponding Author's E-mail:
csimiyu3@gmail.com

[2]Mary Kipmerewo
School of Nursing, Midwifery and Paramedical Sciences
Masinde Muliro University of Science and Technology, Kenya

[3]John Arudo
School of Nursing, Midwifery and Paramedical Sciences
Masinde Muliro University of Science and Technology, Kenya

Crossref

Abstract

Purpose: To examine the association between maternal delay in reaching appropriate health facility and perinatal mortality in Lurambi and Butere sub-counties, Kakamega Kenya

Methodology: A community based retrospective cross-sectional research design was adopted using mixed methods for data collection. A total of 520 respondents were randomly selected from 40 out 830 villages of Lurambi and Butere sub-counties using multistage cluster sampling. The respondents were interviewed from November 2017 to March 2018. Data entry and analysis was done using SPSS Version 25 software. Descriptive and inferential statistical analyses were used. Bivariate and multivariate logistic regressions were applied and adjusted odds ratio was used to determine the strength of association. A p-value of ≤ 0.05 was considered as statistically significant.

Findings: Mothers who were aware of the appropriate health facility were 90% less likely to experience perinatal deaths (AOR: 0.1; 95% CI: 0.1 – 0.4; p< 0.0001), mothers who visited appropriate health facility were 80% less likely to experience perinatal deaths (AOR=0.2; 95%CI: 0.1-0.6; p=0.002).

Unique Contribution to Theory, Practice, and Policy: Unique finding is that proximity to a health facility alone is not critical but proximity to the appropriate health facility that will be able to provide the needed maternal and newborn care is very important in reduction of perinatal mortality. In addition, interventions aimed at creating awareness on the appropriate facility to visit during maternal and newborn complication is critical to ensure perinatal survival.

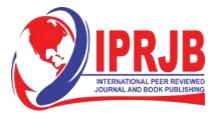**Keywords**: Second *Delay, Emergency Care, Newborn Care, Perinatal Mortality, Kakamega County*

INTRODUCTION

Perinatal mortality includes both stillbirth and early neonatal deaths (Monk, Harris, Donnolley, Hilder, Humphrey, Gordon, 2016; Roro, Sisay and Sibley, 2018). Globally an estimated 4.5 million perinatal deaths occur annually with a daily occurrence of over 12,300 from preventable causes (WHO, 2017; UNICEF, 2017). One million neonatal deaths occur on the day of birth, close to 1.9 million die in the first seven days of life (UNICEF, 2015; You, New, & Wardlaw, 2015) and 2.6 million stillbirths occur annually (WHO, 2020). Sub-Saharan Africa and South Asia has 95% of all (4.5 million) the perinatal deaths that occur globally (UNICEF, WHO, World Bank Group and United Nations.2017). Out of these mortalities, Sub Saharan Africa has the highest with perinatal mortality rate of 34.7 per 1000 births (Akombi & Renzaho, 2019. In many developing countries, access to Emergency Obstetric and Newborn Care services can be difficult due to unaffordable or rarely available means of transportation. (Van Duinen, Adde, Fredin,, Holmer,, Hagander, Koroma, *et al.,* 2020). Kenya is one of the Sub Saharan African countries still experiencing high perinatal mortality rate estimated at 29 per 1000 births (Kenya Demographic Health Survey [KDHS], 2014) against the Sustainable Development Goal (SDG) 3 target 3.2 of 12 per1000 births by 2030 (You, Hug, Ejdemyr, Beise & Idele, 2015). However, perinatal mortality rate in counties with challenges related to transportation to the appropriate health facility. Perinatal mortality may arise from *C*omplications of pregnancy and childbirth if there is a delay in accessing maternal and newborn health care facility (Blencowe, Cousen, Jassir, Say, Chou, Mathers *et al.,* 2016; Geleto, Chojenta, Musa & Loxton 2018). Pregnancy and childbirth-related complications can be identifed and managed when women reach point of care timely to receive quality health services (Karra, Fink &Canning, 2017; Ayele, Melku & Belda, 2019).

Kenya, introduced free maternity services in the year 2013. Although maternity care is officially provided free of charge in public hospitals, indirect costs related to transport and hidden charges still remain a substantial obstacle in timely access to obstetric and newborn care (Kalisa & Malande, 2016). The period during pregnancy complications, labor and child birth is critical and mothers who are out of the health facility need to be transported quickly to the appropriate health facility that will be able to provide adequate care. Kakamega County has been identified as one of the counties with poor perinatal outcomes at a perinatal mortality rate of 28.3 per 1000 births (MOH, 2016). The Kenya Demographic and Health Survey reported poor accessibility and underutilization of maternal and newborn care services (KDHS, 2014) and that could be related to three delays of care. Perinatal mortality rate in Lurambi and Butere Sub counties in Kakamega County were estimated to be at 57 and 40 per 1000 births almost five fold the global target of 12 per 1000 births (District Health Information System [DHIS], 2016).   Delay in transportation of pregnant mothers resulted to complications and this could contribute to perinatal death (Onono, Wahome, Wekesa, Adhu, Waguma, *et al.,* 2019).

Thaddeus and Maine (1994) Model describes three delays in seeking and receiving healthcare that can influence perinatal mortality rates. The first delay is the delay in decision-making to seek healthcare. The delay can be caused by various factors, including lack of awareness about the importance of seeking healthcare, cultural beliefs and stigma associated with seeking healthcare. The second delay is the delay in reaching the healthcare facility, which may be caused by a lack of transportation or inadequate infrastructure. The third delay is the delay in receiving appropriate care at the healthcare facility which may be due to lack of resources, including medical supplies and skilled health care providers. (Geleto, Chojenta, Mussa & Loxton 2018).
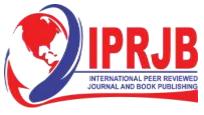
Several studies, for instance, (Ayele, Chojenta, Abdulbasit, & Loxton, 2018; Van Duinen*, et al.,* 2020) have shown that pregnancy and birth complications worsens when mothers take long to reach the service delivery point. The delay in reaching where maternal and newborn care can be provided from results to maternal and newborn complications. A study done by Mengesha & Dangisso (2020) shows that maternal complications contribute largely to perinatal deaths. In addition, Niyitegeka *et al.,* (2017) reported that diminished access to facilities providing emergency obstetric care contributes to increased maternal and perinatal mortality. Once decision is made at home to seek medical care, other actual barriers may impede access to health facilities which could be due to: lack of transport, long distance to the appropriate health facility, non-functioning health facilities in between home and the functioning health facility (Mgawadere, *et al.,* 2017). Facilities with inadequate infrastructure, equipment, enabling environment to provide EmONC signal functions lead to long distances to access care from appropriate health facilities (Chi, Bulage, Urdal & Sundby, 2015). Women may not seek obstetric or newborn care at facilities if they know that staff or services are not available (Carvalho *et al.,* 2020). Accessing health facilities that are not well resourced do not give mothers with obstetric or newborn complications sigh of relieve. Inadequately equipped health facilities result to numerous movements from one health facility to the other until the health facility that can provide care is reached (Niyitegeka *et al.,* 2017).

The significance of distance to health facilities has been demonstrated by various studies indicating that, women may delay in reaching a health facility because of the long distance required to travel (Kumsa, Tura, Nigusse & Kebede, 2016; Niyitegeka *et al.,* 2017). Maternal and neonatal complications demand prompt interventions to prevent perinatal deaths (Carvalho *et al*., 2020) hence the shorter the distance, the faster the complication is likely to be attended to and prevent fatal outcomes. The 5 km radius distance to the nearest health facility or the travel time within two hours to the health facility recommendations made by the WHO are critical (WHO, 2016). Studies indicate that transport of women with obstetric complications is often difficult and medically risky and the time taken from one point to the other may take long delaying the implementation of appropriate care (Niyitegeka *et al*., 2017; Geleto, *et al.,* 2018).

The cost of maternal newborn health care services and being unable to pay for transportation cost to the health facility is a significant barrier to EmONC services that contribute to delay in decision making that results to perinatal mortality (Soma-Pillay & Pattinson 2016). In Kenya, free maternity services were introduced in the year 2013. Although maternity care is officially provided free of charge in public hospitals, indirect costs related to transport and hidden charges still remain a substantial obstacle in timely access to obstetric and newborn care (Kalisa & Malande, 2016). A study in South Africa indicated that the major barriers for pregnant women to access health services were lack of means of transport to a facility (Soma-Pillay &, Pattinson, 2016).

There is a widespread acknowledgement for the need to shorten distance to the health facilities to enhance accessibility to be able to reduce perinatal deaths. Long distance to health facilities has been demonstrated to contribute to maternal complications that result to perinatal deaths. However, access to healthcare facility alone is inadequate. The distance to a healthcare facility that is able to provide definitive maternal and newborn care need to be considered, hence a gap in knowledge exits. Therefore, the present study focused on determining the mother's awareness to accessing the appropriate health facility, number of health facilities visited and the time taken to reach final healthcare facility of care.

Statement of the problem

Perinatal mortality is a major public health concern worldwide with estimation of over 12300 deaths occurring daily (UNICEF, 2017). Sub-Saharan Africa has the highest risk with the least progress (Lawn & Kinney, 2016). Meta-analysis of data from sub-Saharan Africa recently reported PMR of 34.7 per 1,000 births (Akombi & Renzaho, 2019) which is higher than the world estimate of 26.7 deaths per 1,000 births (UNICEF, 2020).

A survey done in Kenya   put Perinatal Mortality Rate (PMR) at 29 per 1000 births in the financial year 2013/2014 (KDHS, 2014). In Kakamega County, PMR is 28.3 per 1000 births which is way above the PMR of 12 per 1000 births or less as recommended by the Sustainable Development Goals (SDGs) and Kenya's Vision 2030 (DHIS 2016, WHO, 2016). Perinatal mortality rate in Lurambi and Butere sub counties in Kakamega County is 59/1000 births more than four times the global target of 12 per 1000 births (DHIS 2016, WHO, 2016).

The high rate of perinatal deaths is associated with poor accessibility to quality delivery of emergency obstetric and neonatal care (EmONC) and low use of available services (Martins *et al.,* 2019; Carvalho *et al.,* 2020). In many developing countries, access to Emergency Obstetric and Newborn Care services can be difficult due to unaffordable or rarely available means of transportation (Van Duinen, *et al.,* (2020). This delay may contribute to poor pregnancy outcomes for her and her baby (Thaddeus & Maine, 1994).

Kakamega County has come up with various   innovative strategies that aim at addressing barriers to reaching maternal and newborn health care service delivery points. Among the innovative strategies by the county are: Oparanya Care Ambulances that help in referrals during emergencies, Oparanya care programme 'Linda Afya ya Mama na Mtoto', that create demand for maternal and newborn care services, implementation of community midwives and community health volunteers (CHVs) that improve maternal and newborn services through enhancing community and health facility linkages. However, time taken for pregnant mothers and newborns from their homes to the appropriate health care facility has never been considered. Therefore, this study aimed at identifying and presenting factors related to maternal delay in reaching appropriate health facility on perinatal mortality in Lurambi and Butere sub-counties.

Objectives
Broad Objective

The main objective was to examine the association between maternal delay in reaching appropriate health facility and perinatal mortality in Lurambi and Butere sub-counties, Kakamega Kenya

Specific Objective
  i) To investigate emergency preparedness and reaching appropriate health facility timely among women residents of Lurambi and Butere sub-counties, Kakamega County, Kenya.
  ii) To assess factors contributing to delay in reaching health facility among women residents of Lurambi and Butere sub-counties, Kakamega County, Kenya.
  iii) To investigate the association between reaching appropriate health facility services timely and perinatal mortality in Lurambi and Butere sub-counties, Kakamega County, Kenya.

Thaddeus and Maine's (1994) model highlights common obstacles to care seeking in settings with limited resources. This model has been adapted and used for studying newborn outcomes (Ayele *et al.,* 2019; Onono *et al*.,2018; Karra *et al.,*2017). More so, various studies (Kumsa *et al.,* 2016; Karra *et al.,* 2017; Niyitegeka *et al.,* 2017; Ayele *et al.,* 2019) have been conducted regarding distance to the health facility and perinatal mortality. Although it seems obvious that access to the health facility during childbirth should reduce perinatal mortality, the evidence from previous studies on the effect of accessing the appropriate health facility needs to be explored as women are likely to experience perinatal mortality even after reaching a health facility. Distance to the health facility is not enough, reaching a health facility that is able to provide the needed care and perinatal outcomes is still a grey area. The researcher used Thaddeus and Maine's (1994) model to examine the way in which delay in reaching appropriate health facility may impact perinatal outcomes in Lurambi and Butere Sub-counties, Kakamega County, Kenya.

MATERIALS AND METHODS

Study Design

A community based retrospective cross-sectional study where both quantitative and qualitative methods of data collection were used.

Study Setting

The study was carried out in Lurambi and Butere sub-counties in Kakamega County. Western Kenya. These subcountiies had the highest perinatal mortalities estimated at 591000 births (DHIS, 2016). The study area has approximate population of 300,000 and covers approximately 372.4 Km^2. This study is dominated by Luhyas of Batsotso, Isukha, Marama and Kisa sub-tribes The main economic activity of residents in the study area is small scale farming. Total fertility rate for Kakamega County was 4.4 children per woman and Contraceptive Prevalence Rate (CPR) stands at 60% for all family planning methods. Pregnant women who received 4+ ANC visits were 45 % while49% had births assisted by skilled birth attendants with 47% of the births delivered in a health facility (KDHS 2014).
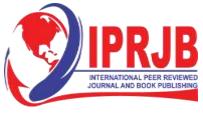
Study of Population

The study population were mothers who were residents of Lurambi and Butere sub-counties who delivered in the last two years preceding the study. The study was conducted between November 2017 and March 2018.

Sampling Technique

A multistage sampling method was used. First, the two sub-counties in Kakamega County were purposively selected. Simple random sampling using lottery method was used to select 4 wards from each sub-county. In the second stage, five Community Units (CUs) were selected from each ward using simple random sampling. Random selection of 40 CUs was done and 19 and 21 CUs in Lurambi and Butere sub-counties, respectively selected. Third stage involved random selection of one village from each CU giving a total of 40 villages. Using table of random numbers, the researcher then randomly selected 13 mothers from each selected cluster giving a total of 520 study participants.

Sample size

The desired sample size was arrived at by using sample size formula for cluster sampling by Suresh and Chandrashekara (2012) for unknown populations with 95% confidence interval.

Based on the PMR of 59/1000 for Butere and Lurambi Sub counties (DHIS 2016), the prevalence rate of 5.9% was used.

Inclusion Criteria

Mothers who delivered in the last two years prior to the study and who were residents of the selected villages were included in the study.

Exclusion Criteria

Mothers who were mentally ill or who experienced perinatal deaths while residing in other sub-counties were excluded in this study.

Research Instruments

The researcher adapted and modified structured questionnaires used in similar study settings WHO Social Verbal Autopsy Instrument (WHO 2014), the Identifying Behavioral, Demographic and Clinical Risk Factors for Delayed Access to Emergency Obstetric Care in Pre-eclamptic women in Port Au Prince, Haiti survey Questionnaire (Hutchinson, 2016) and Newborn Services Rapid Health Facility Assessment Tool (Health Newborn Network, 2012).

Interviewers administered questionnaire that had both open and closed ended questions that captured both quantitative and qualitative data. The open-ended questions required the respondents to give reasons and an explanation of the contributing factors related to specific variables. This tool included background and contextual information relevant to delays that contribute to stillbirths and neonatal deaths. The tool captured information on socio-demographic status, health status and care received relating to antenatal, intrapartum and postnatal care in addition to newborn care. The Three Delay Model was then used as a framework for categorizing contributing factors based on delay in decision making. The instruments were pre-tested in Malava Sub-County that shares similar characteristics with the sub-counties under study.

Qualitative Data Collection Tool

In addition, the researcher used an interview guide to collect qualitative data from key informants who were the Maternity in-charges. The guided questions related to delay in provision of the signal functions and the contributing factors to the major causes of perinatal deaths. This gave supportive data that was triangulated with results from quantitative data.

Data Collection Procedures

Data was collected by 8 research assistants who were trained for two days and the third day used for pre-testing the tools. The principle investigator conducted key informant interviews (KII) with the maternity in-charges. The research assistants identified the households with the help of the CHVs who had mapped the households with the aid of the information in their Daily Activity Registers. The data collection process lasted five months (November 2017 to March 2018).

Data Analysis

All collected data were checked for quality, completeness, cleaned, coded and analysed using the SPSS statistics version 25. The bivariate analysis was done followed by logistic regression. The relationship between independent and dependent variables was tested using the odds ratio and a p-value of of ≤ 0.05 used to reject the null hypothesis.

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RESULTS AND DISCUSSIONS

Findings

Maternal Socio-demographic Characteristics and Perinatal Mortality

Table 1 shows the socio-demographic characteristics associated with perinatal mortality. The socio-demographic factors included, age, marital status, level of education, employment, partner's employment status, religion, parity and birth order. Of these factors, mother's level of education and employment status had an effect on perinatal mortality. A higher proportion of mothers with none or primary education experienced perinatal mortality as compared to the respondents who had secondary and above level of education ($p<0.02$).
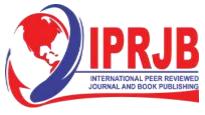
Employment influenced perinatal mortality whereby 58.6% of unemployed mothers experienced perinatal deaths as compared to the ones who were employed ($p<0.03$). Although majority (93.1%) of the respondents who experienced perinatal mortality were affiliated to other religions compared to Catholics, the relationship was marginally statistically significant ($p< 0.06$). The rest of the socio-demographic variables such as age group, marital status, among others posted non-statistically significant relationship with perinatal mortality.

Table 1: Maternal Socio-Demographic Characteristics and Perinatal Mortality

Characteristics	Response	Perinatal death		Alive		p value
		n	%	N	%	
Age group	15 - 24	14	48.3	158	35.0	0.15
	≥25	15	51.7	294	65.0	
Marital status	Married	25	86.2	406	89.8	0.53
	Others	4	13.8	46	10.2	
Level of education	None/Primary	17	58.6	167	37.0	0.02
	Secondary and above	12	41.4	285	63.0	
Employment	Unemployed	17	58.6	173	38.3	0.03
	Employed	12	41.4	279	61.7	
Employment status of partner	Unemployed	1	3.4	11	2.4	0.53
	Employed	28	96.6	441	97.6	
Religion	Catholic	2	6.9	98	21.7	0.06
	Others	27	93.1	354	78.3	
Parity	≤4	17	58.6	318	70.4	0.18
	5 or more	12	41.4	134	29.6	
Birth order	≤2	27	93.1	388	85.8	0.40
	3 or more	2	6.9	64	14.2	

Relationship between the Delay in Reaching Appropriate Health Facility and Perinatal Mortality

This phase of delay is majorly dominated by actual obstacles to reaching appropriate health facility of care. Table 2 shows variables associated with perinatal mortality in relation to delay in accessing the appropriate health facility. Women who did not know the appropriate health facility to go to in case of complications were 6.5 times more likely to experience perinatal death than those who knew the health facilities to visit (OR=6.5; 95% CI:2.9-14.6; $p<0.0001$).

Delay in reaching a health facility was noted among women who had antenatal complications. Comparable evidence was also obtained from the KII # 11:

> "At times, when mothers are advised to go to higher level health facilities because of early sign of a complication, they don't go, instead they go home or decide to go to a different health facility that is of the same level."

One of the maternity in-charges narrated how some mothers delay in seeking delivery services despite evidence that mothers are advised on the appropriate health facility to visit.

> "There is a mother who on palpation the baby felt big. From mother child booklet, there was an evidence that the mother had been advised from one of the dispensaries during her antenatal clinic, to deliver in county referral hospital. When the pregnancy reached term, the mother decided to come to this health centre after having labored at home for some time for fear of an   operation at the county referral hospital. The fetal heart could not be heard on examination and the mother was then quickly referred to county referral hospital" (KII #7).

This study noted that mothers who accessed two or more health facilities before reaching the appropriate health facility that could provide newborn care, were significantly associated with perinatal mortality (OR=3.7;95%CI:1.6-8.9; $p<0.006$). One of the key informants from a dispensary explained how sick newborns are at sometimes referred to other health facilities (KII# 4).

> "Red Cross ambulances are supposed to be used to refer patients. However, once informed the Red Cross ambulance staff takes long to pick the patient. In   a scenario where the newborn is very sick, motorcycle is used to take the patient to the next level of care because the motorcycle is faster instead of waiting for the ambulance that will take hours to come".

Table 2: Bivariate Logistic Regression-Accessing Appropriate Health and Perinatal Mortality

Characteristics	N	Perinatal death (%)	Alive (%)	OR	95%CI	p -value
1. Had transportation problems in reaching health facility during ANC (long distance > 2 hours)	62	6.4	93.6	1.1	0.4 – 3.2	0.8
No transportation problem reaching the health facility during ANC	419	6.0	94.0			
2. Unaware of appropriate health facility	56	21.4	78.6	6.5	2.9 – 14.6	<0.0001
Aware of appropriate health facility	425	4.0	96.0			
3. No transportation problem as a barrier to PNC attendance	380	6.3	93.7	1.3	0.5 – 3.5	0.61
Transportation issues as a barrier to PNC attendance	101	5.0	95.1			
4. Visit other facilities 2 or more H/F for newborn care	50	16.0	84.0	3.7	1.6 – 8.9	0.006
Visited one appropriate H/F	431	4.9	95.1			

Table 2 below shows multivariate logistic regression of predictors of perinatal mortality in Lurambi and Butere Sub counties.

Predictors of Perinatal Mortality

Predictors for second delay were significantly associated with perinatal mortality. These were not being aware of the appropriate health facility and the second one was visiting two or more health facilities before reaching the appropriate health facility with regard to seeking newborn care services. Mothers who were aware of the appropriate health facility were 90% less likely to experience perinatal deaths (AOR: 0.1; 95% CI: 0.1 – 0.4; p< 0.0001). Mothers who visited only one health facility in relation to newborn care were 80% less likely to experience perinatal deaths (AOR=0.2; 95%CI: 0.1-0.6; p=0.002).

Table 3:   Multivariate Logistic Regression of Predictors of Perinatal Mortality

Type of delay	Variable	Estimate	AOR	95%CI	p value
Second delay	Emergency preparedness	-1.99	0.1	0.1 – 0.3	**<0.0001**
	Visiting two or more facilities for Newborn care	-1.49	0.2	0.1 – 0.6	**0.002**

Test of Hypothesis

The hypothesis that guided this study was: Ho= There is no relationship between the three delays model and perinatal mortality in Lurambi and Butere sub-counties. Based on the analysis of data as presented in Table 3, the findings show that second delay is associated with perinatal mortality in Lurambi and Butere Sub-counties. The researcher therefore rejects the null hypothesis.

Second Delay: Delay in Reaching Appropriate Health Facility

Women and their families in the community may make timely decisions to seek medical care but fail to reach the appropriate health facility in time. This study showed significant association between mothers who did not know the appropriate health facility to go to in case of an obstetric complication and perinatal deaths. Mothers who were aware of the appropriate health facility were 90% less likely to experience perinatal deaths. Mothers who accessed the appropriate health facility were likely to get prompt treatment and this could have played a critical role in prevention of perinatal death. These findings are consistent with the findings of the previous studies that demonstrated that accessing health facilities that could not provide emergency obstetric and newborn care increased the likelihood of experiencing perinatal mortality. Seeking care in health facilities which do not provide emergency obstetric care leads to time wastage as the mother has to move from one health facility to the other (Black *et al.,* 2016; Musafili *et al.,* 2017). The same finding has been presented by Black *et al.,* (2017) who showed that pregnant mothers who accessed inappropriate health facilities, had significantly poor pregnancy outcomes as compared to those who attended the heath facilities that were well equipped to manage emergencies. Health facilities with inadequate resources could be linked to poor pregnancy outcome. Accessibility to appropriate health facilities that provided Quality Emergency Obstetric and Newborn Care (EmONC) services is one of the strategies for the reduction of maternal and perinatal mortality (Moinuddin *et al.,* 2017; Maswanya, Muganyizi, Kilima, Mogella, & Massaga, 2018).

Mothers who visited one health facility and got attended to were 80% less likely to experience perinatal deaths. Most mothers who had sick newborns first sought care from their nearest health facilities that were either a dispensary or health centre from where they were referred to other levels of health care. Poor referral system where mothers used their own public transport to the next level of care is associated with perinatal mortality. Some of the sick newborns got referred to higher level of health care mainly due to lack of newborn care unit. Visiting health facilities where care could not be initiated delayed care to the sick newborn. Newborn illnesses progress rapidly and can prove to be fatal if prompt action is not considered on the first contact. Multiple referrals result in delay in provision of care and contribute to perinatal death. A study done by Shamba *et al*., (2017) revealed an association between multiple referrals and newborn
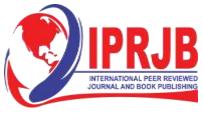
deaths in Southern Tanzania. Studies done by Niyitegeka *et al.,* (2017) and Geleto *et al.* (2018) indicated that limiting referrals by accessing a health facility that is able to provide appropriate care significantly reduced both perinatal and maternal morbidity and mortality.
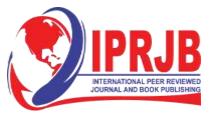
CONCLUSION AND RECOMMENDATIONS

Accessing health facilities that are not able to initiate health care once a pregnant mother or newborn present with complications, contribute greatly to delay in care. This is linked to multiple referrals with delayed appropriate care provision leading to fatal outcomes. Unique finding is that, proximity to a health facility alone is not critical but proximity to the appropriate health facility that will be able to provide the needed maternal and newborn care is very important in reduction of perinatal mortality. In addition, interventions aimed at creating awareness on the appropriate facility to visit during maternal and newborn complication is critical to ensure perinatal survival.

The Lurambi and Butere Sub County Medical Officers of Health (SC-MOH) should ensure that health facilities are well equipped with relevant resources to shorten the distance to reaching appropriate point of care. Special emphasis should be directed towards improving access of mothers from their homes to appropriate health services during pregnancy and childbirth otherwise the efforts towards attainment of perinatal mortality rate as per the global sustainable development goal may be challenging in Kakamega County.
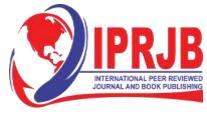
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