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Risk Factors Forneonatal Deaths at Kericho County Referral Hospital, Kenya

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Abstract: *Objective. The purpose of the study was to assess the risk factors associated with neonatal deaths in Kericho Referral Hospital. Design. This retrospective cohort study adopted a Descriptive Correlation design Setting. The study is conducted in Kericho county referral hospital, Kericho County Sample. This comprised of files of total neonates who died at KCRH before 28 days of life that occurred during the study period (n = 110) Analysis. Descriptive statistics was used to summarize qualitative data. Main outcome measures. Risk factors for neonatal deaths Results. The study found out that majority of admitted neonates were preterm. It was found out that preterm birth and neonatal deaths relate together since preterm normally have underdeveloped organs hence are at a higher risk of experiencing complications. Also, preterm are at higher risk of respiratory distress, severe birth asphyxia, infections, hypothermia. Also, small gestation age and neonatal deaths relate together in that small gestation age are prone to complications such as infection, feeding problems which may result to neonatal deaths.Furthermore, on matters of weight, majority of the neonatal deaths had a birth weight of 2499 grams and below. However, majority (57%) of the newborns were not admitted due to low birth weight.The study found out that majority of the newborns were admitted due to failure to establish breathing during birth. Furthermore, majority of the newborns failed to breath due to the following; poor apgar score, respiratory distress syndrome, prematurity, pre-eclampsia, prolonged labor, meconium aspiration syndrome, pneumonia, born before arrival, down syndrome, fetal distress, uncontrolled augmentation, cord around the neck, and other unknown causes.The study found out that majority of the newborns were not admitted due to neonatal infection and majority of them got the infection at the age of 0-7 days. It was indicated that suctioning and ambu bagging did not cause neonatal infection as there was no newborn that was infected due to suctioning and ambu bagging.Conclusion. The results support that low birth weight, breathing failure at birth and neonatal infections are risk factors that cause neonatal deaths in Kericho Referral Hospital. Majority of newborns were admitted due to low birth weight because of multiple births and it was common cause of admission in the newborn unit. Recommendations.The study also recommends that the government of Kenya programs that encourage the education and empowerment of girls and young women in general and are related to childbirth issues, in particular should be strengthened.The study recommends further studies to focus on neonatal care during antenatal care, care immediately or shortly after delivery, and in the first month of life, as well as specific interventions to reduce neonatal deaths.*

Keywords: *Risk factors, neonatal deaths, Kericho county, Kenya,*

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I. Background

Neonatal death is defined as death that occurs within the first 28 days of life (WHO, 2016). According to Kliegman et al (2016), the neonatal period which is from birth to the first 28 days of life is the most challenging period of life because neonates are more predisposed to various problems. The majority (75%) of all neonatal deaths occurs during the first week of life, and about 1 million newborns die within the first 24 hours (WHO, 2018). An estimated 2.8 million NDs occurred globally, accounting for 40% of under 5 deaths (Wardlaw et al., 2014) and more than 50% of infant deaths (Chatupa et al., 2016). Globally, there is an increase in the number of NDs and a very slow decline as compared with the post neonatal period (WHO, 2016). The worldwide NMR decreased from 36 to 19 deaths per 1000 LB between 1990 and 2015, equivalent to a decline from 5.1 million to 2.7 million NDs (WHO, 2016). The NMR in developed countries is 4deaths per 1000 LB and 23deaths per 1000 LB in developing countries (UNICEF, 2016). In 2018, Sub-Saharan Africa had the highest NMR of 28 deaths per 1,000 live births, followed by Central and Southern Asia with 25 deaths per 1,000 live births (Liu L et al., 2015). Ethiopia reported the highest with 37 deaths per 1000 live births (Debelew et al., 2014) while Kenya has 21 deaths per 1000 live births (WHO, 2016). At Moi Teaching and Referral Hospital,

early NMR was found to be 68 per1000 LB at (Yego et al., 2013) and 30.1 per1000 LB in 2018 at Kericho county referral hospital (DHIS, 2018).

Risk factors associated with neonatal deaths include: multiple births due to premature birth (Ko et al., 2018), passive smoking during pregnancy, pregnancy interval < 3 years, multiple pregnancy, gestational age, low birth weight, abnormality, failure to establish breathing at birth (birth asphyxia), male child and caesarian deliveries (Ghotbi et al., 2017). Overweight babies and those born from mothers with higher education were found to be at a higher risk of NDs (Etambuyu& Charles, 2015).Low birth weight baby is a baby born with a birth weight less than 2500 grams regardless of gestation age (WHO, 2016). A low birth weight baby may either be preterm or small for gestational age (term baby with birth weight less than 2500 grams). LBW babies are more vulnerable to illness than normal birth weight and term babies (WHO, 2016). According to WHO (2016), LBW categories are: LBW (babies weighing below 2500 grams at birth); very low birth weight (babies weighing below 1500 grams); extremely low birth weight (babies weighing less than 1000 grams).

A study in Ethiopia employed a community-based mixed-method approach between September and October 2016. From the study, about 11% of neonates died before reaching five months of life, mainly during the first week. The risk of dying from LBW during the neonatal period was found to be nearly four times the current estimated national NMR (Eshete et al., 2019). Seid et al (2019) found out that LBW was a major cause of NDs in Ethiopia representing 8% of NDs. The same picture was noted in Uganda by Arunda et al (2018) where about 75% of all LBW died during the neonatal period by 2011. This shows that the health system has been inadequate in its efforts to save LBW babies. Emphasis is on provision of focus ANC and quality PNC services among others to reduce the mortality rates. At Moi Teaching and Referral Hospital (MTRH), Kenya a study was done to assess the incidence of early NDs in women who delivered at the facility and describe other associated factors. A retrospective assessment of neonatal records was conducted with detailed analysis of the most recent 200 neonatal deaths records. Early NMR from January 2004 to December 2011 was found to be 68 per 1000 live births. The findings showed higher risks of NDs in mothers aged 15–24 years (51%), multiparous women, mothers in referred admissions, gestational age of less than 37 weeks and in latent stage of labor. Pre-term birth and asphyxia were leading causes of early NDs (Yego et al., 2013).

Failure to establish breathing at birth remains a major cause of global mortality, contributing to almost a quarter of the world's 3 million neonatal deaths (Lawn JE et al., 2009). In Nepal, a prospective community-based study was conducted from September 2002 to January 2006. Failure to establish breathing at birth accounted for 30% of NDs and this was linked to maternal infections, prematurity, and multiple births. It was highly associated with low socioeconomic status necessitating community-based interventions towards reducing neonatal mortality (Lee,et al., 2008). Similar findings were seen in rural area of Bangladesh that reported a NMR of 32.3 per 1,000 live births, with 52% of NDs caused by birth asphyxia (Chowdhury HR et al., 2010).A study in Ethiopia by GdiomGebreheat et al (2018) noted failure to establish breathing at birth as one of the most important causes of morbidity and mortality among neonates. Results revealed a prevalence of 22.1% related to caesarean section, meconium stained amniotic fluid, LBW, prolonged labor. These findings are similar to that of Wosenu et al (2018) that was done in the same country. The study believed that the risk factor may reduce as the fetal chest passes through the birth canal probably because excess fluid is squeezed out of the lungs, which would be a risk for asphyxia. Also, presence of meconium in the amniotic fluid may lead to aspiration of it into the lung that could eventually result in perinatal asphyxia.

Neonatal infection is a blood infection that can be caused by a number of bacteria, including Escherichia coli, Listeria, and certain strains of Streptococcus (mainly, Group B Streptococcus) (Edmond & Zaidi, 2010). Neonates are a vulnerable group in the population who are prone to infections (Ballot et al., 2012). Neonatal infections can be classified into 2 types according to the age of onset; early onset (occurs in first 7 days of life) and late onset infections (occurs after the 7th to the 28th day of life). Most of the late neonatal deaths occur due to neonatal infections (Chowdhury et al., 2010).In Uganda, a cohort study was conducted from March to May 2012 on neonatal sepsis and its associated factors, and followed up till the end of the neonatal period. The incidence of neonatal sepsis was 11% and was associated with lack of financial support from the father and prolonged rupture of membranes prior to delivery. Maternal hand washing before handling the baby was found to be a protective factor. Of the 317 neonates who completed the follow up period, 1 ND was reported (Kayom et al., 2018).From the literature studied, the researcher noticed there was a gap in methodology; some studies were done prospectively using case control designs to achieve their objectives (Ghotbi et al., 2017), some reviewed retrospectively neonatal death records only (Ko et al., 2018, Yego et al., 2013). Therefore, the researcher is interested in studying the risk factors associated with neonatal deaths at KCRH. Knowledge from this study will guide in formulation of policies to be used by the hospital management and other service providers in reducing neonatal deaths.

II. Methods

Permission was sort from the college Research Committee and the nursing Research and Ethical Review committee. Potential respondents approached in groups and explained the purpose of the study and the impacts and measures taken to observe confidentiality will be distributed. Informants were advised of the voluntary nature of the study and given option to withdraw from the study at any stage without being subjected any penalty. Prior to the commencement of the questionnaires, they were required to fill the written informed consent to allow them participate in the study.

Research Design

This retrospective cohort study adopted a Descriptive Correlation design. Correlation design involves measuring two variables; low birth weight in relation to neonatal deaths (Mugenda Mugenda, 2003). Retrospective review of files was conducted for neonates who died using a medical abstraction tool and interview checklist for key informants in order to achieve the objectives of the study. The events that had already occurred that led to NDs were collected and analyzed.

Study setting

The study is conducted in Kericho county referral hospital, Kericho County. Kericho County Referral Hospital (KCRH) is a referral hospital for other health facilities in Kericho County and a teaching hospital for medical students and interns. It is a government tier 3 health facility located in Township location of Ainamoi constituency, 300 metres from town. It has a bed capacity of 350, and situated in a 22-acre piece of land. It has a catchment population of 92,396, with majority of the patients from rural areas. It provides comprehensive services; curative, promotive, preventive and rehabilitative services. The hospital constitutes various service providers with nurses being the majority. Newborn unit is confined within the maternity ward, and admits both term and preterm babies. It has 8 bed cots, 5 incubators, 2 phototherapy equipment, 2 suction units, 1 oxygen set and 5 piped oxygen, all of which are operational. The facility reports an average of 430 LB per month, and a monthly admission of about 17 neonates in NBU, more than three quarter are preterm babies.

Participants

Target population is defined as a complete set of individuals; cases or objects with some common observable characteristics (Mugenda Mugenda, 2003). This comprised of files of total neonates who died at KCRH before 28 days of life that occurred during the study period (= 154 cases). The choice of this population is important because they contribute to 69% of infant mortality in the hospital (DHIS report 2018). The inclusion criteria involved records of neonates admitted during the study period at the facility and should have died within 28 days of life. Also, staffs working in newborn unit that were present during the study period. Apgar score of six and below at five minutes after birth will be included in the study.Simple random sampling was used for the files and then purposive sampling for HCWs. A sample of 154 was calculated using Yamane (1967:886) formula.

Questionnaire

The tool that was used in this study was developed by the researcher based on the literature on risk factors associated with neonatal deaths in low- and middle-income countries. The transcription form and interview checklist were designed in English, to be used by the researcher and 2 research assistants. Part of the audit tool was adopted from the following study on risk factors or causes of failure to establish breathing at birth; in Kakamega by Kiptui (2017). The transcription form had 3 sections where qualitative (secondary) data was collected: first section captured low birth weight in relation to neonatal deaths, second section was on failure to establish breathing at birth in relation to neonatal deaths; and third section was on neonatal infections in relation to neonatal deaths. These sections were filled by extracting data from neonatal records. The interview checklist had structured questions based on the study objectives, data was gathered quantitatively (primary data) from the relevant staffs. Both open and closed questions were employed in this mixed study.Face validity was obtained through an approval by the senior academic staff. Internal validity was obtained by piloting the instruments on some files and staff. This population was not included in the main study. On the other hand, content validity was determined by discussing the items in instruments with the colleagues and other experts. In order to test reliability of the instrument to be used in the study, test-retest method was used. This ensured that the instrument was well structured and easily understandable. The scores given in the sets of measures were then correlated to obtain an estimated co-efficient of reliability.

III. Data Analysis

After data collection, the researcher checked the instruments for completeness and clarity. Data was analyzed both quantitatively and qualitatively according to the study objectives. Descriptive statistics was used to summarize qualitative data. Analysis involved editing, tabulating and coding the responses. Data was processed using the Statistical Package for Social Science (SPSS) computer software version 21.0. Frequency distribution, percentage, means scores and standard deviation were computed and entered into a table.In quantitative analysis, data was processed by first categorizing and discussing response for each item according to themes (thematic analysis), before editing, coding, and reporting through descriptive narrative of the views, experience and opinions of the respondents. Descriptive statistics namely frequency distribution and percentages were used to analyze the coded response. Chi-square was used to measure the association of the variables. Correlation coefficient was used to measure the strength of the relationship.

IV. Results

Out of the 112transcription forms distributed, 110 were correctly filled and returned which represented a response rate of 98.2 percent. Out of the 14 health workers sampled, 12 responded. According to Mugenda and Mugenda (2003) a response rate of 50 percent is adequate, a response rate of 60 percent is good, and a response rate of 70 percent is very good. Therefore, the 80 percent response rate reported for this study formed an acceptable basis for drawing conclusions. The study took to assessing the secondary data from the hospital portal for the underlying issues on low birth weight in trying to find its relationship with neonatal deaths, the findings are indicated in Table 1.

Table 1:Low birth weight in relation to neonatal deaths

Demographics		Frequency	Percent
Gestation at birth	Term	34	30.9%
	Preterm	64	58.2%
Birth weight	>2500 grams	35	33.01%
	<2499 grams	71	66.9%
Admission due to low birth weight	Yes	43	39.4%
	No	66	60.6
Causes of the low birth weight	Multiple births	5	4.55%
	Others	61	56.36%
	Not applicable	43	39.09%
Low birth weight as a cause of death	Yes	11	10.0%
	No	98	90.0%

Table 1 shows that in Kericho county, the gestation at birth for term were 34 (30.9%), preterm were 64(58.2%) and 12(10.9%) had no data.35 of the newborns had a weight of greater than 2500 grams and 71 had below 2499 grams.43 newborns were admitted due to low birth weight and 66 newborns were not admitted due to low birth weight. Majority (60%) of the newborns admitted were not admitted due to low birth weight.4.55% of the newborns admitted due to low birth weight were because of multiple births, 56.36% were due to other reasons which were captured using thematic analysis and they are as follows; prematurity, polyhydramnios, pre-eclampsia, HIV exposed infants, antepartum hemorrhage, placenta previa, induced abortion, inevitable abortion. The most occurring condition was prematurity. 39.09% of the findings recorded were not applicable.90% of the findings indicated that low birth weight (LBW) was not the cause of neonatal deaths while LBW was responsible for 10% of the cases in the hospital. The contributing factors to 10% of the cases include: jaundice, birth defect, maternal condition such as anaemia.

Breathing Failure at Birth in Relation to Neonatal Deaths

Findings revealed that 91 newborns were admitted due to failure to establish breathing during birth and 19 newborns were admitted due to other causes. Majority (83%) of the newborns were admitted due to failure to establish breathing during birth. 9.09% of the newborns established breathing problems during birth due to prolonged labor, 9.09% due to inhaling secretion, 68.18% due to other factors such as poor apgar score, RDS because of lung immaturity, pre-eclampsia, prolonged labor, MAS, pneumonia, born before arrival, down syndrome, uncontrolled augmentation, cord around the neck and some were unknown causes, while 13.64% of the recorded findings were not applicable. Majority (51) of newborns had an Apgar score of 6 and below while 28 of them had 7 and above. 93 newborns had resuscitation done on them, 14 of them had no resuscitation while 3 recorded findings were not applicable. Majority (85%) of the newborns had resuscitation done on them. 82.73% of the newborns died due to failure to breathe during birth while 17.27% died due to other causes such as: 2nd twin, delay referrals, down syndrome. A summary of findings is in Table 2.

Table 2: Breathing Failure at Birth in Relation to Neonatal Deaths

Items		Frequency	Percent
Admission due to failure to establish breathing	Yes	91	82.7%
	No	19	17.3%
Failure to establish breathing due to various factors	Prolonged labor	10	9.09%
	Inhaling secretion	10	9.09%
	Others	15	13.64%
	Not applicable	74.9	68.18%
Apgar score at 5 minutes after birth	6 and below	51	46.4%
	7 and above	28	25.5%
Resuscitation done	Yes	93	84.5%
	No	14	12.7%
	Not applicable	3	2.7%
Failure to establish breathing at birth a cause of death	Yes	19	17.27%
	No	91	82.73%

Neonatal Infection in Relation to Neonatal Deaths

Findings show that majority (92.73%) of the newborns were not admitted due to neonatal infection while 7.27% were admitted due to neonatal infections.16 newborns got infected at the age of 0-7 days, 3 newborns got infected at the age of 8-28 days while for 91 newborns recorded, results were not applicable. Therefore, majority (84%) of neonatal infections occurred at the age of 0-7 days.19 newborns were infected by neonatal infection due to other factors and 91 recorded findings were not applicable (had no neonatal infection).12.73% of the admitted newborns were treated due to neonatal infection (all the cases were treated), while (majority) 87.27% of the newborns were maintained on prophylaxis antibiotics since they didn't have the infection, but are prone to infections.15.45% of the newborns died because of neonatal infection and majority (84.55%) of them died because of other factors like respiratory failure, intestinal obstruction among others.50% of health workers indicated that neonatal infection is the common cause of admission in Kericho Referral Hospital while the other 50% disagreed with the statement (Table 3). Further findings to the study uncovered the commonly factors associated with neonatal infections, which include; bottle feeding, prolonged labor, prematurity, maternal illness passed to the newborn such as chorioamnionitis, lack of an aseptic technique during delivery or cord care.

Majority (92%) of the health workers indicated that the common age of onset of infection is between 0 to 7 days after birth. Further findings sought to establish the relationship between early onset of infections and neonatal deaths and the findings identified were poor management of the infection or delay in starting treatment resulting to other complications and eventually casing death. The health worker reiterated that early detection of the infections and proper management matters in containment of infections and curing them. The study further looked into the relationship between late onset infections and neonatal death, the findings presented that most late onset of infection are hard to manage since mostly they present themselves when they are at the peak and normally manifest themselves to severe sepsis and septic shock which ultimately result in deaths.

Table 3: Neonatal Infection in Relation to Neonatal Deaths

Items		Frequency	Percent
Admission due to neonatal infection	Yes	8	7.27%
	No	102	92.73%
Age of the onset infection	0-7 days	16	14.5%
	8-28 days	3	2.7%
	Not applicable	91	82.7%
Neonatal infection due to various factors	Others	19	17.3%
	Not applicable	91	82.7%
Treatment due to neonatal infection	Yes	14	12.73%
	No	96	87.27%
Neonatal infection a cause of death	Yes	17	15.45%
	No	93	84.55%
Neonatal infection a common cause of admission	Yes	55	50.0%
	No	55	50.0%

Bivariate analysis of risk factors and neonatal deaths

The correlation coefficient can range in value from -1 to +1. The larger the absolute value of the coefficient, the stronger the relationship between the variables. For the Pearson correlation, an absolute value of 1 indicates a perfect linear relationship. A correlation close to 0 indicates no linear relationship between the variables. Summary is found in Table 4.

Table 4: Correlation Matrix

	LBW cause of deaths	failure to establish breathing at birth cause of death	neonatal infection a cause of death
gestation at birth	.085	-.068	-.148
birth weight	-.082	.248	-.117
admitted due to LBW	.233	.367	-.174
LBW due to	-.181	.547	-.156
admitted due to failure to establish breathing	.092	.843	-.295
failure to establish breathing at birth due to	-.017	.306	-.115
Apgar score at 5 minutes after birth	-.213	.575	-.181
resuscitation done	.040	.027	-.207
admitted due to neonatal infection	-.020	-.232	.489
age at onset of infection	-.070	-.279	.074
neonatal infection due to	-.071	-.544	.572
treated due to neonatal infection	-.035	-.407	.860

V. Discussion

The purpose of the study was to assess the risk factors associated with neonatal deaths.The study revealed that the gestation at birth for term were 34 (30.9%), preterm were 64(58.2%) and 12(10.9%) had no data. This shows that in the year 2018 that majority of admissions were preterm babies. The findings of this study are in agreement with the findings of Lawn, Cousens & Zupan, (2010), who in the study found out that more of the neonatal births in NBU are preterm.The study went further to find out the causes of admission that were not due to low birth weight and the findings include: moderate and severe birth asphyxia, respiratory distress syndrome (RDS), meconium aspiration syndrome (MAS), poor apgar scores, kernicterus, neonatal sepsis, neonatal jaundice, pneumonia, cleft palate, congenital abnormality like heart defects, down syndrome, necro entero-colitis. The most common condition being RDS and MAS and the least is jaundice. The finding of this study corroborates the findings of Saleem &Bokhari, (2014), who in their study, pattern of neonatal admissions & its outcome in a tertiary care hospital of southern Punjab, found out that not all the admission of neonates is due to low birth weight.

Findings revealed that 4.55% of the newborns admitted due to low birth weight were because of multiple births, 56.36% were due to other reasons which were captured using thematic analysis and they are as follows; prematurity, polyhydramnios, pre-eclampsia, HIV exposed infants, antepartum hemorrhage, placenta praevia, induced abortion, inevitable abortion. The study further illustrates the findings of Zeng, Cheng, Dang, Yan, Dibley, Chang & Kong, (2008), who gave insights on the birth weights and admission to hospitals in Indian. Findings also revealed that 90% of the findings indicated that low birth weight (LBW) was not the cause of neonatal deaths while LBW was responsible for 10% of the cases in the hospital. The findings of this study are in line with the findings of Zile, Ebela&Rozenfelde, (2017), whose study concluded that low birth weight is not responsible for neonatal deaths.

The current study found that 9.09% of the newborns established breathing problems during birth due to prolonged labor, 68.18% due to other factors such as poor apgar score, RDS because of lung immaturity, pre-eclampsia, prolonged labor, MAS, pneumonia, born before arrival, down syndrome, uncontrolled augmentation, cord around the neck and some were unknown causes. The findings of the current study were in unison with the findings of Jehan, et.al (2009), who in their study found out that the factors listed above are the risk factors which make the newborn unable to breath. From the finding's majority (85%) of the newborns had resuscitation done on them. The finding of the current study is in agreement with the recommendations of Wall, et.al, (2009), who recommended resuscitation to be made simpler for low income country so as to save more newborns that might experience difficulty in breathing.

The findings show that 82.73% of the newborns died due to failure to breathe during birth while 17.27% died due to other causes such as: 2nd twin, delay referrals, down syndrome. The findings of the study challenge the findings of Tewabe, Mehariw, Negatie&Yibeltal, (2018), who concluded that newborns do not succumb because of failure to establish breathing at birth.The study also revealed that 19 responses indicated that neonatal infection was due to other causes such as MAS, prematurity, inhaling secretions, HIV exposed

infants, unhygienic standards for home delivery, and oxygen tubings. The findings of the study are in agreement with Hayun, Alasiry, Daud, Febriani&Madjid, (2015). The current study also found that 15.45% of the newborns died because of neonatal infection and majority (84.55%) of them died because of other factors like respiratory failure, intestinal obstruction among others. The findings of the current study corroborate the findings of Jehan et al (2009), who in their study did not attribute neonatal deaths to neonatal infections.

VI. Conclusion & Recommendation

The results support that low birth weight, breathing failure at birth and neonatal infections are risk factors that cause neonatal deaths in Kericho Referral Hospital. Majority of newborns were admitted due to low birth weight because of multiple births and it was common cause of admission in the newborn unit. On how low birth weight relates with neonatal death, the study concluded that 10% of the neonatal deaths were due to low birth weight complications. However, low birth weight is not the main cause of neonatal deaths since there are other underlying causes. Low birth weight is associated with neonatal death because it causes complications ranging from feeding problems, underdeveloped organs and risk of hypothermia among others. Low birth weight babies receive quality care in Kericho Referral Hospital.

On how breathing failure at birth relates with neonatal deaths in Kericho Referral Hospital, the study concluded that newborns were admitted due to failure to establish breathing during birth. Majority of newborns were found to have an Apgar score of 6 and below in 5 minutes after birth and had resuscitation done on them. Majority of the newborns died due to failure to breathe during birth however there are other underlying causes of deaths that did not necessarily happen due to failure to establish breathing. The study concluded that failure to breathe at birth is a common cause of admission and there are commonly associated conditions with failure to establish breathing at birth. Furthermore, it was realized that there is a relationship between aspiration of amniotic fluid and prolonged labor and failure to establish breathing during birth. The study also concluded that, babies who fail to establish breathing during birth are given quality care in the hospital in Kericho Referral Hospital and that failure to breath during birth is associated with neonatal deaths.This study recommends thatcommunity-level programs should increase knowledge of danger signs and how to obtain assistance in case neonatal complications at delivery occur and programs that encourage the education and empowerment of girls and young women in general and are related to childbirth issues, in particular should be strengthened. The study recommends further studies to focus on neonatal care during antenatal care, care immediately or shortly after delivery, and in the first month of life, as well as specific interventions to reduce neonatal deaths.

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