Socio-Economic Factors Associated with Occurrence of Stillbirths among Women Delivering in Selected Hospitals of Marsabit County

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Abstract

Worldwide, of the 130 million babies born every year, approximately 4 million are stillborn, more than 98 per cent of these occur in developing countries. Stillbirth remains a widespread unfavorable pregnancy outcome estimated to occur in 2.64 million pregnancies annually across the globe with majority of this cases occurring in low and middle-income countries. Even though the government of the Republic of Kenya has put in place several measures such as the National Health Insurance Fund, Free Child Delivery Programs for pregnant women among other measures in order to meet the Sustainable Development Goals on health, the problem of stillbirths continues to prevail in the country at alarming rates. The study sought to determine socio-economic factors associated with occurrence of stillbirths among women delivering in selected hospitals of Marsabit County. A cross-sectional descriptive study design was used targeting women who delivered at Marsabit County. The study used both qualitative and quantitative data collection techniques. A total sample size of 387 mothers were selected from Kalacha Sub-County Referral Hospital, Laisamis Sub-County Referral Hospital, Moyale Sub-County Referral Hospital and Marsabit County Referral Hospitals proportionately using systematic sampling with a predetermined interval of 10 while 8 nurses were selected purposively to provide additional information as the Key Informants. After data collection, Statistical Package for Social Sciences version 24.0 was used to analyze descriptive statistics for quantitative data. Inferential statistics were calculated using Chi Square and Fisher's Exact Tests at 95% confidence interval and p-values of <0.05considered significant. The study results revealed that the rate of stillbirth occurrence was 5.9 per cent. Socio-economic factors such age (p=0.006), education (p=0.007), occupation (0.002) and level of income (p=0.047), maternal factors such as antenatal attendance (p=0.031), use of illicit drugs (p=0.041), low

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maternal weight (p=0.043) and tough domestic work (p=0.004). The results further revealed low knowledge levels among respondents with a significant influence (p=0.039) on outcome of delivery. The study concluded that the respondents from Marsabit County experience relative high rates of stillbirths compared to the national figure. The outcome of delivery was significantly influenced by socio-economic and low knowledge levels which influenced outcome of delivery.

Keywords: Stillbirth; Antenatal Care; Delivery of Still Birth

Background Information

Stillbirth refers to a baby born with absolutely no signs of life at or after 28 weeks of pregnancy according to International Classification of Diseases (ICD-10). According to World Health Organization, stillbirth refers to as a baby born with no sign of life at or after 28 completed weeks of gestation. Globally, it is estimated that 2.6 million stillbirths occur each year. Of these, 98% occur in low and middle income countries with more than half (55%) occurring in sub-Saharan Africa [1]. About 1.3 stillbirths occur during labor and childbirth and can be prevented. Stillbirths remain a global public health menace. Especially low income country settings, and particularly those with a high proportion of home deliveries, why the fetus died will often be unknowable, and the percentage of stillbirths without a clearly defined cause will be even higher. It is also important to note that some of the still births are not reported and as such this burden cannot clearly be understood due to poor health reporting systems especially among developing countries. The most common risk factors of still births that have been documented includes: lack of access to skilled birth attendants during delivery, low socio-economic status, poor nutritional status, infections, prior stillbirths, advanced maternal age among others.

Many demographic risk factors have been comparatively regular in their reported relations with stillbirth, of which increased maternal age appears to have been most commonly documented [2]. Compared to younger mothers, losses in older mothers occur more frequently throughout pregnancy, but the risk difference is greatest after 37 weeks gestation. Fretts and Usher [3] using the McGill stillbirth database for 1978 to 1995, compared stillbirth etiology between women less than 35 years old with those 35 years and older [1]. Stillbirths among older women were more likely to be attributed to infection at a statistically significant level; abruption, malnutrition, and diabetes were of borderline significance. Women less than 20 years of age also appear to have an increased tendency to fetal loss, with crude stillbirth rates increasing as age decreases. Mothers less than 15 years continued to have an elevated adjusted odds ratio of 2.3 for antepartum stillbirth. Utilizing a large nationwide American sample, Bateman found women less than 20 years of age to have only a slightly increased adjusted odds ratio of 1.11 (95% CI 1.08-1.14) when compared to women aged 20 to 34 years [4]. Few studies have looked at the changes in stillbirth risk for different age groups over time.

Occupation determines the economic status of the family. When women are working in well-paying jobs they tend to take care of themselves well in terms of diet, healthy lifestyle, good living conditions, and better medical care among others. Whereas women who are not employed lack finances to ensure good living conditions or attaining better medical care due to poverty. Many of such women does not attend antenatal care as well as skilled birth attendants thus predisposing themselves to instances of undesirable birth outcomes such as still births. Study conducted among Swedish blue-collar and low level white-collar workers were 1.5 to 2 times more likely to have a stillbirth than women with higher positions, associations which remained after adjustment for age, country of birth, body mass index, height and smoking [5]. Controlling for the number of prenatal visits, involuntary childlessness, pre-gestational or gestational diabetes, Pre-eclampsia or Eclampsia, smoking, and body mass index had only minor effect on the association between occupation and stillbirth in this study [6]. Studies conducted in Latin America and Caribbean have shown that maternal work status determines health status Other domestic work like procurement and carrying of water and firewood, planting and land

cultivation have the potential to damage women's spine and pelvis, aggravate a prolapsed uterus and complicate childbirth.

Educational level of pregnant women is another socio-demographic factor that influences outcomes of births. Higher education level is associated with better employment, and thus higher socio-economic status which affects the birth outcomes. Studies conducted among pregnant women found out that in Nova Scotia used education level, Blishen Index (a measure of occupational status), and household income to quantify SES significantly affected birth outcomes. Of these, only household income (< $60000 annually) was found to be a significant predictor of stillbirth. Although pre-pregnancy obesity did not confound the association between income and stillbirth, smoking did account for 18.5% of the relationship [7].

There may be higher rates of stillbirths occurring across the world since the captured figures are mere estimates due to poor reporting systems [8]. Developing countries have higher rates of stillbirths as compared to developed countries with significant variations between countries. The rate of stillbirths in developing countries is 25.5/1000 births with sub-Saharan Africa and South Asia having the highest rates of 32.2/1000 and South Asia 31.9/1000 births respectively.

In East Africa, Kenya has the third highest rate of stillbirths estimated at 23/1000 births. This prompted the government of Kenya to structure interventions such as Beyond Zero campaigns and universal healthcare enshrined in the government's four agenda thus improve maternal health and curb the rising number of stillbirths. The government is also implementing the framework of Every Woman Every Child structured under Sustainable Development Goals (SDGs), a strategy aimed at addressing the issue of stillbirths worldwide [9].

High rates of still births in developing countries are associated with lack of access to good-quality obstetric care, resulting to intra-partum deaths [10]. Stillbirths are associated with lack of access to skilled birth attendant, poor nutritional status, advanced maternal age and low socio-economic status. Other factors include pregnancy complications, use of harmful drugs, delivery complications and delayed caesarean section [7]. Despite systems in place to classify and report stillbirths, it is difficult to determine the exact cause thus leaving a considerable number unexplained. Discerning the actual

burden of stillbirth and identifying plausible approaches for decreasing stillbirth rates is important in low to middle-income countries.

Despite implementation of several measures to ensure improved delivery outcomes such as Beyond Zero campaigns, the Big Four Agenda (Universal Health Care) and free maternal delivery, the rates of stillbirths remains questionable. The rate of stillbirths in Kenya stood at 23/1000 birth. The government of Kenya has a lot to do to meet the Every Newborn Action Plan (ENAP) target of less than 12 stillbirths/1000 births by 2030 [10]. In North-Eastern Kenya, about 2% of all deliveries are stillbirths. Marsabit County is one of the 15 counties with poor maternal delivery outcomes with the rate of stillbirths standing at 30.3/1000 births.

Many stillbirth cases remain undocumented as a major public health problem despite it being heartbreaking losses to women leading to breakage of marriages. Perinatal mortality and still births are seen as normal happenings in most communities and thus always go unreported. Therefore, this study aimed at examining the risk factors for occurrence of stillbirths among women delivering in selected hospitals in Marsabit County, Kenya.

Methodology

The study adopted a cross-sectional facility-based descriptive study design to collect and analyze both quantitative and qualitative data. The study was carried out in Marsabit County, one of the countries from the Upper Northern Kenya. The county has four sub-counties namely Saku, North Horr, Laisamis and Moyale. The study was carried out in all public hospitals in the County which includes Marsabit County Referral Hospital, Moyale Sub-County Referral Hospital, Laisamis Sub-County Hospital and Kalacha Sub-County Hospital (in North Horr Sub County). The hospitals are moderately equipped to provide comprehensive health services to the catchment population. The study population included all mothers who delivered in the facilities within a period of six months between September 2018 to February 2019, Approximately 4228 births occur in Marsabit County semi-annually including about 128 stillbirths. The study was carried out across a period of six months.

Marsabit County was purposively chosen since it exhibits high rates of stillbirths. All sub-counties were included in the study. Four health facilities were purposively selected based on the number of deliveries

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conducted. Moyale sub-county referral hospital, Marsabit County referral hospital, Laisamis Sub-County Hospital and Kalacha Sub-County hospital formed the study sites. Respondents were selected using systematic random sampling at a sampling interval of 10. This was achieved through dividing the study population (4228) by the sample size of 387. The first respondent was selected using simple random sampling through folded pieces of paper. Every 5threspondent leaving the selected facilities were interviewed until the required 387 respondents in total in all facilities was reached. The number of respondents selected from each facility was proportion to the number of postnatal women delivering in each facility. Eight (8) nurses were purposively selected to provide additional information as Key informants. Those who were in a position to give informative data recruited as Key Informants for the study. Pretesting of research tools ensured clarity of questions to respondents thus eliciting the required information. The researcher also incorporated expert opinions (supervisors) to construct well-structured research instruments. Data collection was done across a period of six months from September 2018 to February 2019. The respondents were guided to fill their responses by the trained research assistants. The researcher sought approval from Kenyatta University Graduate School. Ethical clearance to carry out this research was obtained from Kenyatta University Ethics Review Committee (KUERC). The researcher sought a research permit from the National Commission for Science, Technology and Innovation (NACOSTI). The researcher further sought permission from County Commissioner, County Education Officer and the Director of Health Services from Marsabit County. The research was given authorization from the hospital management of the selected facilities prior to data collection after clarifying the purpose of the study. An informed consent to participate in the study was gotten from each respondent. Study respondents were assured of privacy and confidentiality of information given. They were treated with the respect they deserved and participation in the study was voluntary without due coercion.

Quantitative data from questionnaires were cleaned, coded, double entered, double checked and stored into Microsoft Excel program for analysis. Data was then exported to SPSS version 22.0 for analysis. Descriptive statistics were presented as charts, graphs, percentages and frequency distribution tables. Inferential statistics were used to test the association between the study variables. This was achieved through Chi-square and Fisher's Exact Tests done at 95% confidence interval and p-values less than 0.05 considered significant. Qualitative data from KII were triangulated with quantitative data as direct quotes or narrations presented in verbatim.

Results

The results showed that more than half 210 (54.3%) of the respondents were aged between 20-29 years followed by 111 (28.7%) who were aged between 30-39 years. Regarding the respondents' marital status, majority of them 274 (70.8%) were married while 65 (16.8%) reported to be single. Regarding the number of children, the respondents had, majority 236 (61.0%) of the respondents reported to be having 0-2 children followed 112 (28.9%) who had between 3-5 children.

Concerning the highest education level attained, the results revealed that below half 149 (38.5%) of the respondents had attained primary education followed by 125 (32.3%) had secondary education. The results also showed that more than half 215 (55.6%) of the respondents were Muslims while 172 (44.4%) of them were Christians. With regards to occupational status, below half 167 (43.1%) of the respondents were not employed followed by 142 (36.7%) who were self-employed.

When the respondents were asked about their level of their income, slightly less than half 172 (44.4%) of the respondents reported to be earning an income of less than Kshs 5,000 followed by 65 (16.8%) who earned between Kshs. 5,000-10,000. The results were presented in the table 1 below:

Independent Variable	Respondent response	Frequency (N)	Percentage (%)
Age	≤19	39	10.1
	20-29	210	54.3
	30-39	111	28.7
	40-49	27	7
Marital status	Single	65	16.8
	Married	274	70.8
	Separated/divorced	28	7.2

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	Widowed	20	5.2
No of children	0-2	236	61
	03-May	112	28.9
	>5	39	10.1
Highest educational level attained	No formal education	53	13.7
	Primary education	149	38.5
	Secondary education	125	32.3
	Tertiary education	60	15.5
Religion	Muslims	215	55.6
	Christian	172	44.4
Occupation	Employed	78	20.2
	Self-employed	142	36.7
	Not employed	167	43.1
Level of monthly income (KShs)	<5000	172	44.4
	5000-10000	65	16.8
	11000-20000	64	16.5
	≥21000	86	22.2

Table 1: Socio-economic characteristics of respondents (n=387).

Influence of Socio-Demographic Factors on Outcome of Delivery

The study sought to determine the influence of socio-economic factors on delivery outcome. The results showed that more than half 13 (56.5%) of the respondents aged between 20-29 years had stillbirths. There was an association between age of the respondent and the delivery outcome (p*=0.006). Majority of the respondents 18 (66.4%) who had stillbirths were married. However, there was no statistical association between marital status and delivery outcome (p*=0.738). One of the Nurse in a Key Informant Interview session reported;

"…Most of our clients come here alone without their husbands or partner. Delays on the way without help of a partner can results to complications which can affect the outcome of delivery. When on is married early complications also occur during delivery which affect the delivery outcomes, for instance, her the culture advocates for early marriages which leads to young girls who have been married of getting pregnant which will cause difficulties during delivery hence affecting the outcomes…"

The findings revealed that majority 222 (61.0%) of those who had between 0-2 children had live births. There was no statistical association between the number of children and delivery outcome (p*=0.448). However, qualitative data did not support the results as described by nurse during a key informant session who reported that;

"…In most cases women with higher parity tend to have negative delivery outcomes. This can be attributed to the fact that most do not follow the required timing and spacing of births and thus end up delivering before the recommended 2-year period. This makes them face complications during delivery and thus influencing the delivery outcomes. This is mostly common among the Muslim communities who are the majority in this area…"

Concerning the highest level of education attained by the respondents, the results found out the more than half 12 (52.2%) of the respondents who had no formal education had stillbirths. There was a significant statistical association between highest educational level attained and delivery outcome (p*=0.007). The results showed that more than half 13 (56.5%) of the respondents who had stillbirths were Muslims. However, there was no significant statistical association between religion and delivery outcome (p=1.000).

Regarding the occupational status, more than a third 9 (39.2%) of the respondents who had still births were employed. There was a statistical association between occupational status and delivery outcome (p=0.002). The findings also revealed that majority 15 (65.2%) of the respondents who had stillbirths had a monthly income of less than Kshs 5,000. There was a significant statistical association between monthly family income and delivery

outcome (p*=0.047). The results were as presented in table 2 below.

Independent Variable	Respondent response	Dependent variable (Outcome of delivery)		Statistical significance
		Live birth (N=364)	Still birth (N=23)	
Age	≤19	37(10.2%)	2(8.7%)	X2 =20.230 df=3 p*=0.006
	20-29	197(54.1%)	13(56.5%)	
	30-39	105(28.8%)	6(26.1%)	
	40-49	25(6.9%)	2(8.7%)	
Marital status	Single	63(17.3%)	2(8.7%)	X2 =1.251 df=3 p*=0.738
	Married	256(70.3%)	18(78.3%)	
	Separated/divorced	26(7.1%)	2(8.7%)	
	Widowed	19(5.3%)	1(4.3%)	
No of children	0-2	222(61.0%)	14(60.9%)	X2 =1.736 df=2 p*=0.448
	03-May	107(29.4%)	5(21.7%)	
	>5	35(9.6%)	4(17.4%)	
Highest educational level attained	No formal education	41(11.2%)	12(52.2%)	X2 =16.421 df=3 p*=0.007
	Primary education	142(39.0%)	7(30.4%)	
	Secondary education	122(33.5%)	3(13.0%)	
	Tertiary education	59(16.2%)	1(4.3%)	
Religion	Muslims	202(55.5%)	13(56.5%)	X2 =0.009 df=1 p=1.000
	Christian	162(44.5%)	10(43.5%)	
Occupation	Employed	69(18.9.0%)	9(39.2%)	X2 =20.118 df=2 p=0.002
	Self-employed	135(37.1%)	7(30.4%)	
	Not employed	160(44.0%)	7(30.4%)	
Level of monthly income (KShs)	<5000	157(43.1%)	15(65.2%)	X2 =15.568 df=3 p*=0.047
	5000-10000	64(17.6%)	1(4.3%)	
	11000-20000	60(16.5%)	4(17.4%)	
	≥21000	83(22.8%)	3(13.0%)	

Table 2: Association between socio-economic characteristics and outcome of delivery (n=387).
Key: P*=Fisher's Exact Test.

Discussion

The researcher sought to find out the socio-economic factors influencing outcome of delivery in Marsabit County. The results showed that majority of the respondents were aged between20-29.This may be due to high population growth across the world increasing the number of women in the reproductive age bracket. There was an association between age of the respondent and the outcome of delivery. However, majority of stillbirths occurred among the age bracket of 20-29. This was due to the fact that they formed a larger part of the study respondents.

The results were contrary to a study done by Dwyer [1] who compared occurrence of stillbirths between mothers aged less than 35 years and those with more than 35 years old. It was confirmed that most stillbirths occurred among the cohort aged 35 years and over. The results were also inconsistent with another study done in the United States of America who revealed that there were higher odds of stillbirths occurring among those aged with less than 20 years. This was because they had under-developed reproductive organs and thus influenced the occurrence of poor maternal outcomes [4]. As one ages, there is increased risk of complications resulting to chances of stillbirths occurring according to a study done in Germany.

Regarding the respondents' marital status, the study revealed that; majority of the respondents were married. In fact, most stillbirths occurred among those married.

However, was no significant statistical association between marital statuses? The results were in agreement with a study conducted in Brazil and United Kingdom which did not find out there was no direct effect of marital status on occurrence of stillbirths [11]. The results were inconsistent with a study done in public health facilities in Addis Ababa, Ethiopia which associated marital status with occurrence of stillbirths [12]. The results were also contrary to another study done among African-American women which revealed that births from unmarried women were at an increased risk of stillbirths [13].

In relation to the number of children one has, the results from this study revealed that most of the respondents reported to have given birth to less than or equal to two children. This may be because majority of the respondents were young mothers hence had not given birth to more children. There were no significant statistical association between parity and occurrence of stillbirths. The results were inconsistent with a Ukrainian study which found out that increase in parity increases the risk of maternal complications resulting to occurrence of stillbirths [14]. In another study done in Sokoto, Nigeria, similar results were reported in which parity played a key part in occurrence of stillbirths. In fact, higher parity results to increased maternal complications consequently causing poor delivery outcomes such as stillbirths.

Concerning the highest education level attained, the results revealed that a larger proportion of respondents had attained primary level of education. This is supported by low literacy levels in Marsabit count as result of distant schools and relatively poorer backgrounds as it forms part of the arid and semi-arid region of Northern Kenya. Education was statistically significant towards occurrence of stillbirths. Education empowers women to seek more information on their pregnancy consequently increased rate of using health facility ANC services during pregnancy.

The results concurred with a study done by Auger [15] who found out that fewer years of education were associated with higher risk of stillbirth occurrence as they may be in a position not to identify danger signs of pregnancy and use of health facility services at their disposal. The results were also contrary to a study done by Scotia (2007) on socio-economic predictors of stillbirth occurrence in which education was found to have no effect on stillbirth occurrence. Better education

leads to better job opportunities hence increased access to quality health services hence reduced stillbirths.

The results also reported that most of the respondents interviewed were Muslims. This may be explained by the fact that majority of the inhabitants of the northern Kenya region are Muslims. The results did not find any significant statistical association between region and outcome of delivery. The results were contrary to a study done in Northern Ethiopia which revealed that there was a significant statistical association between religion and outcome of delivery because some religion in the study area were against use of contraceptives resulting in unplanned pregnancies without following health timing and spacing of pregnancy [16]. The results were consistent with another study to determine occurrence of stillbirths which showed that majority of the respondents were Muslims.

With regards to occupational status, most of the respondents were not employed with majority of them having a level of monthly income of less than 5,000 Kenyan Shillings. There was a significant statistical association between level of income and outcome of delivery. Income enables women to seek health services in terms of paying for the transportation costs, better nutritional status and paying for hospital services. According to a study conducted in Sweden among blue collar and low level white collar workers were 1.5 to 2 times more likely to have a stillbirth than women with higher work positions [5]. In another study conducted in Latin America and Caribbean have shown that maternal work status determines the health status such that domestic work like procurement and carrying of firewood aggregate a prolapsed uterus and complicate childbirth hence poor delivery outcomes such as stillbirth occurrence.

Conclusion

The results revealed that majority of socio-economic factors influenced outcome of delivery due to associated effects on maternal conditions and access to care centers. In fact, age, level of education attained, occupation and level of monthly income showed significant statistical association with delivery outcomes. This explains the variation on delivery outcomes as they play a crucial role in accessing healthcare services during pregnancy and hence eventual delivery.

Recommendations

The relevant NGOs and the county government should discourage early marriages which results to poor pregnancy outcomes. They should also empower women through creation of conducive environment for income generating activities so that they can be able to improve their family income thus increased utilization of health services.

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