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The factors associated with caesarean section at a rural hospital in Southwestern Uganda: A cross-sectional study

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Original article

FACTORS ASSOCIATED WITH CAESAREAN SECTION AT A RURAL HOSPITAL IN SOUTH WESTERN UGANDA: A CROSS-SECTIONAL STUDY .

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Abstract

Background:

Globally, the overall prevalence of caesarean section (CS) is estimated at 18.6%, with 27% in high-income countries and 6% in low- and middle-income countries. There is an increase in trends of CS in Uganda from 8.5% in 2012 to 11% in 2016. No studies have been carried out to account for the high rates of CS at Kisiizi Hospital in Uganda. This study determined the proportion and factors associated with CS delivery at a rural hospital in southwestern Uganda.

Methods:

This was a cross-sectional study of 321 immediate postnatal women in a rural hospital in south-western Uganda. A structured questionnaire and data abstract forms were used to collect information on the proportion and factors associated with CS. Eligible participants were enrolled consecutively. Logistic regression analysis was done to identify the factors associated with CS taking into account potential confounders.

Results:

This study recruited 321 women with a mean age of 25.8 ± 6.086 years, mean parity of 2.6±1.673 and mean antenatal care visits of 4.27 ± 1.197. The proportion of CS in this study was 38.3% (123/321). Of these, 110 (89.4%) were emergencies and 27(10.6%) were electives. Only 8.4% of the respondents were referrals. The commonest indications of CS were fetal distress (28.5%), history of previous CS (18.7%), and poor progress of labour (11.4%). No factors were significantly associated with CS in this study.

Conclusion:

There is a high proportion of CS at Kisiizi Hospital in Uganda and this is three times higher than the WHO-recommended CS rates. The majority of CS are emergencies due to fetal distress and poor progress of labour. There is a need for additional studies exploring the reasons for the much higher-than-expected CS rates.

Keywords: caesarean section, postnatal period, spontaneous vaginal delivery, Submitted: 2023-05-08 Accepted: 2023-05-10

1. BACKGROUND

Caesarean section is a life-saving procedure fundamental to preventing undesirable obstetric out-

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comes for the woman and fetus (1, 2). There is, however, a growing concern of gradually increasing CS delivery rates causing a major public health concern (3). Globally, the prevalence of CS is estimated at 18.6%, with high-income countries contributing 27%, low and middle-income countries 6%, and Africa 7.3% (4). In Uganda, the overall rate of CS for live births at facilities was estimated at 9.9%, increasing from 8.5% in 2012 to 11% in 2016 (5). The World Health Organisation (WHO) recommends CS rates of 10-15% to achieve optimum maternal and neonatal benefits whilst CS rates less than 10% may indicate inadequate utilization of CS services among women who need them, while more than 15% of CS rates suggests an injudicious use of CS especially without medically indicated reasons (6)

The review of the hospital records at the study health facility indicated an appreciably high number of CS deliveries, 30.2% compared to total deliveries in 2017 (7). CS delivery indications have been researched on such as; fetal, maternal, and placental factors (8-11). Different factors have been found to contribute to CS delivery such as; social demographics including age, occupation, and obstetric factors including; number of ANC visits, parity, timing of first ANC visit, and health system factors such as; referral status and distance to the health facility (3, 12-16). In Uganda, few studies have focused on factors associated with CS majorly in urban settings (11, 17).

Higher rates of CS deliveries at Kisiizi Hospital found in southwestern Uganda exceeding the national CS rates and WHO recommended rates are worth noting. Research has demonstrated undesirable outcomes associated with high CS rates including; poor pregnancy outcomes such as; nosocomial infections, delayed breastfeeding, long hospitalization, and high costs (1, 2, 18, 19). Studies have not been done in the rural private facility setting to account for the high rates of CS in Uganda and there is a paucity of literature focusing on reasons for the high CS rates and associated factors. Therefore, this study aimed at determining the proportion and factors associated with CS at a Kisiizi hospital in South Western Uganda.

2. METHODOLOGY

2.1. Study design and setting:

This was a hospital-based cross-sectional study conducted from December 2018 to March 2019 among 321 women who were immediate postnatal mothers within 72 hours at a rural hospital in southwestern Uganda. Kisiizi Hospital is a missionary not-for-profit referral hospital that offers general and specialized healthcare and serves a population of 300,000. In 2017, the rural hospital had a total of 2,229 deliveries, with 1,554 (SVDs) and 675 (CS) (7). Kisiizi Hospital had a staffing of 2 obstetricians, 5 Medical officers & 2 intern doctors, and 23 midwives in 2017 (7).

Study population and eligibility criteria: The study included all women who had delivered in the rural hospital within 72hrs. Women who were critically ill, deaf, and dumb, had stillbirths and early neonatal deaths were excluded from the study. This study was conducted between December 2018 to March 2019.

2.2. Sample Size and Sampling Procedure

The sample size was calculated using the Kish-Leslie formula. The 30.2% proportion of CS was used in this study (7), 95% confidence interval, and gave a sample size of 324 women. Consecutive sampling was used to select the participants until the required sample was got.

2.3. Study variables

The outcome variable was CS while the independent variables included; social demographic, obstetric, and health system factors. Caesarean section was defined as an operation performed under regional or general anaesthesia to deliver the fetus, placenta, and membranes through an incision in the abdominal and uterine wall (9, 10). Age was collected in complete years from the date of birth. Age was then categorised as <18yrs, 18-34yrs, and ≥35yrs. Parity and number of pregnancies one had had before were collected in complete numbers and both were categorized as 1, 2-4, and ≥5. The number of ANC visits a mother had attended during that pregnancy was collected in numbers and categorized as <4 and ≥4.

With education level, no formal education was collected as those who had never gone to school, primary education was collected as those who had had 1-7 years in school, secondary education was collected as 1-6 years in secondary school and tertiary education was collected as university or diploma.

2.4. Data collection procedure and tools:

A structured questionnaire was used for data collection for both independent and dependent variables. Data abstract form was used to gather additional information from the participant's medical file. The questionnaire was used to collect data on social demographic variables such as age, educational level, tribe, family income, religion, type of marriage, marital status, and distance from home to the nearest health facility. The questionnaire had obstetric variables such as parity, number of pregnancies one had ever had, number of ANC visits, and timing of 1st ANC visit. The data abstract form was used to collect more information on obstetric variables such as gestational age at delivery, reasons for CS, and the neonates' birth weight. The data abstract form was used to collect data on some health system variables such as referral status, referral distance, and level of referring health facility. The questionnaire was also used to collect a health system variable like community-based insurance.

2.4.1. Quality control:

The questionnaire and data abstract forms were pretested at a rural hospital in Uganda. Data were checked for completeness, errors, and omissions. We recruited four research assistants and were trained on research protocols and data collection procedures.

2.5. Data analysis

Data were entered, cleaned, and analyzed using the SPSS computer package version 23.0. Continuous variables were summarized as medians, means, and standard deviation. The proportion of CS was determined by dividing the number of postnatal women who had delivered by CS by the total number of women who had delivered from the rural hospital during the study period. Bivariate analysis was done to determine the factors associated with CS. Odds ratios and 95% confidence intervals were computed to measure association and a $P<0.05$ indicated statistical significance. All variables with P values <0.05 at bivariate analysis were entered into a multivariate logistic regression model to determine independent associations with CS.

3. RESULTS

3.1. Social demographic characteristics

The mean age of the study participants was 25.8 (±6.086), the median age of 25.0 years, and the majority 275 (85.7%) of the respondents were aged 18-34 years. The social demographic characteristics of participants are shown in **(Table 1)**

3.2. Obstetric characteristics of study participants

More than half of the respondents 180 (56.1%) had had 2-4 pregnancies and the majority of the participants 211 (65.7%) had attended <4 ANC visits. The obstetric characteristics of participants are shown in **(Table 2)**

3.3. The health system of the study participants

More than half of the respondents 168 (52.3%) had community-based insurance, 27 (8.4%) were referrals and 12 (44.4%) of the respondents had travelled a distance of≥20km to a hospital. The health system characteristics of participants are shown in **(Table 3).**

3.4. The proportion of caesarean section

Out of the 321 women who delivered at the rural hospital, almost two-thirds 198 (62.0%) of them had SVD and 123 (38.0%) had CS. Of the 123 women who had CS, 110 (89.4%) were emergencies and 13 (10.6%) had electives.

3.5. The indications of caesarean section

Out of 123 respondents who had had CS delivery, slightly over one in four (29.9%) was due to fetal distress, (18.2%) was due to previous CS, and (10.7%) was due to poor progress of labour.

3.6. Factors associated with caesarean section

Multivariate analysis was not done because almost all the factors associated with CS were not statistically significant after bivariate analysis. The number of ANC visits attended was the only factor found to be associated with CS after bivariate analysis in this study.

Table 1: The social demographic characteristics of study participants

Characteristics	Frequency	Percentage
Age in years		
<18	9	2.8
18-34	275	85.7
≥35	37	11.5
Ethnicity		
Mukiga	271	84.4
Others***	50	15.6
Marital status		
Single	13	4.0
Married/Cohabiting	305	95.0
Divorced/Separated	03	0.9
Educational level		
No formal education	13	4.0
Primary	158	49.2
Secondary	132	41.1
Tertiary	18	5.6
Religion		
Catholic	178	55.5
Others*	143	44.5
Occupation		
Formal employment	17	5.3
Peasants	241	75.1
Self-employment	63	19.6
Residence		
Urban	10	3.1
Rural	247	76.9
Semi urban	64	19.9
Distance from home to nearby HC (km)		
≤5	176	56.6
≥6	135	43.4

*Peasants included all women who practice small scale farming
*Others include: Anglicans, born again and Muslims
***Others include: Banyankole, Baganda, Batooro,Bahiima

Table 2: The Obstetric characteristics of study participants

Characteristics	Frequency (%)	Mean (SD), Median
Number of pregnancies ever had		
1	95 (29.6)	
2-4	180 (56.1)	2.79 (±1.787), 2.0
≥5	46 (14.3)	
Parity		
1	107 (33.3)	
2-4	177 (55.1)	2.6 (±1.673), 2.0
≥5	37 (11.5)	
Number of ANC visits attended		
<4		
≥4	211 (65.7)	2.60 (±1.673), 2.0
	110 (24.3)	
First ANC visit in current pregnancy		
<12 weeks	71 (22.1)	
12-24 weeks	235 (73.2)	16.85 (±4.742), 16.0
25-32 weeks	15 (4.7)	
Weeks of gestation at delivery		
30-37	44 (13.7)	
38-42	274 (85.4)	39.2 (±2.017), 40.0
43	3 (0.9)	
Baby's birth weight (kg)		
<2.5	27 (8.4)	3.16 (±0.514), 3.14
2.5-4.0	283 (88.2)	
>4	11 (3.4)	
Maternal HIV status		
Negative	306 (95.3)	
Positive	15 (4.7)	

Table 3: The Health system characteristics of study participants

Characteristics	Frequency	Percentage
Community Based Insurance		
Yes	153	47.7
No	168	52.3
Referral status		
Yes	27	8.4
No	294	91.6
Reasons for referral (n=27)		
Poor progress of labour	18	5.6
Fetal distress	4	1.2
Others*	5	1.5
Level of referring Health Centre (n=27)		
HC II	3	0.9
HC III	14	4.4
HC IV	3	0.9
Private facility	7	2.2
Distance from referring HC to a rural hospital (km) (n=27)		
	8	29.6
<20	7	26.0
20-49	12	44.4
≥50		

Table 4: Bivariate analysis of the social demographic factors associated with caesarean section delivery at Kisiizi Hospital

Variables	CS N (%)	SVD N (%)	Crude Odds Ratio (95% CI)	P- value
Age in years				
<18	4 (44.4)	5 (55.6)	1.00	
18-34	108 (39.3)	167 (60.7)	0.529 (0.119-2.351)	0.403
≥ 35	11 (29.7)	26 (70.3)	0.808 (0.212-3.078)	0.755
Marital status				
Married	114 (37.4)	191 (62.6)	1.00	
Not married	9 (56.3)	7 (43.8)	2.154 (0.781-5.942)	0.138
Educational level				
Primary & below	62 (36.3)	109(63.7)	1.00	
Secondary and above	61 (40.7)	89 (59.3)	1.205 (0.768-1.892)	0.418
Occupation				
Peasants	90(37.3)	151 (62.70)	1.00	
Employed	33 (41.7)	47 (58.8)	1.178 (0.703-1.974)	0.534
Residence				
Urban	29 (39.2)	45 (60.8)	1.00	
Rural	94 (38.1)	153 (61.9)	0.953 (0.560-1.624)	0.860
Distance from home to nearby HC (km)				
>5	45 (33.3)	90 (66.7)	1.00	
≤5	73 (41.5)	103 (58.5)	1.417(0.889-2.261)	0.143

***Variables selected for multivariate analysis (P<0.2)**

Table 5: Bivariate analysis of the obstetric factors associated with caesarean section delivery

Variables	SVD N (%)	CS N (%)	Crude Odds Ratio (95% CI)	P- value
Number of Pregnancies				
≥5	30 (65.2)	16 (34.8)	1.00	
1-4	168 (61.1)	107 (38.9)	1.194 (0.621-2.295)	0.594
Parity				
≥5	26 (70.3)	11 (29.7)	1.00	
1-4	171 (60.4)	112 (39.6)	1.548 (0.736-3.258)	0.250
Number of ANC visits				
<4	141 (66.8)	70 (33.2)	1.00	
≥4	57 (51.8)	53 (48.2)	1.873 (1.169-3.000)	**0.009***
First ANC visit (weeks)				
1-12	40 (56.3)	31 (43.7)	1.00	
13-32	158 (63.2)	92 (36.8)	0.751 (0.440-1.283)	0.295
Gestation weeks at delivery				
43	2 (66.7)	1 (33.3)	1.00	
28-37	26 (59.1)	18 (40.9)	1.385 (0.117-16.444)	0.797
38-42	170 (62.0)	104 (38.0)	1.224 (0.110-13.661)	0.870
Baby's birth weight				
>4kg	7 (63.6)	4 (36.4)	1.00	
2.5- 4kg	172 (60.8)	111 (39.2)	1.129 (0.323-3.948)	0.849
<2.5	19 (7.4)	8 (29.6)	0.737 (0.168-3.238)	0.686

***Variables selected for multivariate analysis (P<0.2)**

Table 6: Bivariate analysis of the health System factors associated with caesarean section delivery

Variable	SVD N (%)	CS N (%)	Crude Odds Ratio (95% CI)	P- value
Community Based Insurance				
No	101 (60.1)	67 (39.9)	1.00	
Yes	97 (63.4)	56 (36.6)	1.149 (0.732-1.804)	
				0.546
Referral status				
No	185 (62.9)	109 (37.1)	1.00	
Yes	13 (48.1)	14 (51.9)	1.828 (0.828-4.032)	
				0.135
Level of referring HC to Kisiizi Hospital				
Public	2 (28.6)	5 (71.4)	1.00	
Private	11 (55.0)	9 (45.0)	0.327 (0.051-2.105)	
				0.240
Distance from referring HC to Kisiizi Hospital (km) (n=27)				
<20	2 (25.0)	6 (75.0)	1.00	
≥20	12 (63.2)	7 (36.8)	5.143 (0.807-32.773)	0.083

Table 7: Multivariate analysis of the factors associated with caesarean section delivery

Variables	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	P value
Marital status			
Married	1.00	1.00	0.071
Not married	2.185 (0.792-6.026)	2.626-0.922-7.479	
Number of pregnancies			
<4	1.532 (0.974-2.416)	1.245 (0.768-2.019)	0.374
≥4	1.00	1.00	
Number of ANC visits (weeks)	1.00		
<4	1.914 (1.194-3.067)	1.00	
≥4		1.941 (1.195-3.154)	**0.007***
Distance from home to nearby HC (km)			
<10			
≥10	1.821 (0.942-3.521)	1.788(0.906-3.529)	0.094
	1.00	1.00	

*statistically significant variables (P<0.05)

4. DISCUSSION:

4.1. Proportion of caesarean section delivery

The proportion of women who underwent CS, 38.3% in this study was significantly higher than the current national average of 11% in Uganda (20). The proportion is also greater than the 25% CS rates that were observed in a study conducted in Kabarole District, western Uganda (21). WHO recommends an acceptable CS range of 10-15% to achieve optimum maternal and neonatal benefits (6). Kisiizi Hospital is a not-for-profit private hospital with general and specialized healthcare services and serves the surrounding population of Rukungiri and neighboring districts. The results of this study may be because the rural hospital is famous in the region for offering cost-effective obstetric services, which attract many women to deliver from there either as self-referrals or as referrals from other public and private facilities from within or outside the Rukungiri district.

Another appreciable reason for the high proportion of CS in this study could be that the majority of the rural health centres have notably inadequate resources and a deficiency of healthcare staff including; midwives, nurses, doctors, and obstetricians (21), thus resulting in women preferring to deliver from this hospital compared to other health facilities located in the same region. Preference to use the study hospital is further explained by the fact that the hospital comprises; 2 obstetricians, 5 medical officers, 2 intern doctors, and 33 midwives, and this staffing, in particular, may contribute to the high proportion of CS (7). These results concur with those from other studies where a high level of staffing was significantly associated with increased CS (22, 23).

The study hospital has experienced staff from the United Kingdom that support the Obstetrics and Gynaecology Department as part of the Uganda Maternity and Newborn Hub program thus this could be attributed to the high CS rates at this hospital compared to other rural hospitals lacking such friendly programs. This study, in particular, enrolled only eligible immediate postnatal women within 72 hours and this could have resulted in the missing out on women who delivered by SVD and got discharged within 24- 48 hours, thus by the time the research team came to the postnatal ward the next day, they may have ended up finding the majority of the admissions as post-operative CS clients as their main study participants. This may have played a fundamental contribution to the appreciable high proportion of CS at the health facility.

A high proportion of CS observed in this study closely concurs with findings from another study conducted in Kenya where the proportion of CS was 32.6% (24). The findings further show close similarity with those from another study conducted in Bangladesh (35.0%), Ethiopia (34.3%), and Northern America (32.3%) (25). Despite the

high proportion of CS rates observed in this study, other studies conducted in the private hospitals of Tehran Iran, Brazil, and two public hospitals in Shanghai showed much higher CS rates of 86.2%, 62.0%, and 58.1% respectively (26-28). A high proportion of CS rates in these studies may be due to a high preference for CS among women in developed countries.

Contrary, a study carried out in Ghana showed a lower proportion of CS (6.59%) (29). Similar findings were observed in developing countries like Somalia where health services remain a challenge resulting in low CS rates among women demonstrated by their refusal to consent due to cultural and social economic reasons (30). Low CS rates were observed in another study conducted in Ethiopia, and many deliveries were not attended to by skilled healthcare personnel thus the government attempted to improve access to care by training non-physician clinicians to perform CS (CSA, 2012). Another study carried out in Cameroon found out low CS rate of 5.69% in semi-urban and 6.22% in rural areas (28)

Out of the 123 participants who had CS delivery in this study, 110 (89.4%) of them were emergencies and 13 (10.6%) were elective or planned CS deliveries. Common indications for CS in this study included; fetal distress (28.5%), history of previous CS scar 18.7%, poor progress of labour (11.4%), and CPD (6.5%). This is not surprising as the majority of the literature sources indicate similar indications for CS (31) (32, 33). The high percentage of fetal distress may be attributed to over-diagnosis since the fetal Heart rate (FHR) was determined subjectively using a fetoscope.

The high proportion of CS may be attributed to the poor quality of the ANC services that could be provided to women, with medical staff missing out to detect early pregnancy deviations, to prepare women for delivery. High rates of emergency CS rates could be attributed to poor monitoring of labour by midwives, nurses, and doctors thus having an appreciable percentage of women going for CS. The indications of CS in this study concur with those from other studies conducted in Fort Portal Uganda, South Africa, Nepal, Bangladesh, and Brazil (34) (35) (36). Similar indications of CS including; failure of progress of labour and history of the previous scar was also found in a systematic review and meta-analysis done in LMICs (37).

4.2. Factors associated with caesarean section delivery

In this study, the number of ANC visits was associated with CS delivery. Women who had attended ≥4 ANC visits were more likely to have CS compared to their counterparts who had attended <4 ANC visits. This finding could be attributed to the poor quality of ANC services offered to women by healthcare providers, where pregnancy deviations may not be detected early. The finding in this study concurs with similar studies conducted in Uganda, Kenya, and Bangladesh where attendance of ≥4 ANC visits was associated with increased CS (21, 38, 39). Another study conducted in public hospitals in Brazil found that having ≥6 consultations during ANC visits was associated with increased CS (28). These findings are contrary to those of a study conducted in Southwestern Ethiopia which showed that respondents who had attended one ANC visit were more likely to have CS compared to their counterparts who had attended more than one ANC visit (40).

Findings in this study show that women who had a parity of ≤4 were more likely to have CS compared to their counterparts who had a parity of ≥5. Interesting to note is information from previous literature sources identified primigravida as a risk factor for CS (31, 32). Although parity was not associated with CS in this study, other studies conducted in South Africa, Brazil, and Bangladesh found a relationship between less parity with increased CS (28, 34, 35). Similar findings from other studies done in Japan and Brazil found that CS was common among nulliparous women (41, 42). On the contrary, results from a study conducted in Ghana found that the odds for CS decreased with increasing parity (29). This discrepancy may be explained by the information in different textbooks and literature sources which consider both categories as risk factors for CS (31, 32)

In this study, participants who completed secondary level and above were more likely to have CS compared to their counterparts who had primary level and below. This finding may be explained by the frequent ANC visits attended by such women with high education levels at the hospital, as this study found the attendance of ≥ 4 ANC visits being associated with increased CS. Although education was not significantly associated with CS in this study, other studies conducted in Bangladesh and Kenya have found a relationship between secondary education and above with increased CS (34, 38). On the contrary, a study carried out in Ghana found primary education and junior schooling to be associated with increased CS (29). This discrepancy in these studies may be associated with the difference in the study setting, sample size, study time, and the percentage of people with secondary education and above within the sample size.

Findings in this study show that women aged ≥ 35 years were 19.2% less likely to have CS compared to their counterparts aged <18 years. This may not make sense in this study due to the low numbers found where both age groups are at risk of having CS as mentioned by different literature sources and textbooks. Although the age of ≥35 years was not significantly associated with CS in this study, surprisingly, studies in Ghana, Bangladesh, Brazil, and Denmark found that advanced maternal age ≥35 years was positively associated with CS (28, 29, 34, 39, 43). The higher odds for CS among women with advanced maternal age in these studies are explained by the increased risk of maternal obstetric complications developing with advanced maternal age as evidenced by written literature from textbooks (31, 32). On the contrary, a study conducted in Ethiopia and Ghana found that the odds of CS were lower among women aged 15-19 years compared to women aged ≥35 years (44) (29). In this study, women who were employed were more likely to have CS compared to their counterparts who were peasants. This may be attributed to the fact that employed women are more economically stable and thus are empowered to attend more ANC visits, thus early detection of pregnancy complications increasing the likelihood of CS. Although occupation was not statistically significant with CS in this study, other studies conducted in Kenya, Ethiopia, Bangladesh, and Pakistan established a statistically significant relationship between occupation and CS (25, 34, 38, 45).

Women who were referred were more likely to have CS compared to the non-referrals in this study. This is not surprising because they already had delivery complications as explained by the high percentages of indications of CS in this study. Although referral status was not significantly associated with CS in this study, a study conducted in the Democratic Republic of Congo found that referral status was associated with CS delivery (46). Similarly, another study conducted in Tanzania showed an appreciably high CS level among medically referred women (47).

Findings in this study show that women who were on community-based insurance were more likely to have CS compared to their counterparts who were not insured. This may be attributed to the frequent ANC visits attended by women on insurance, as they have already planned costs, and attendance of more ANC visits is found associated with CS in this study. Although there was no statistical significance between health system factors such as community-based insurance, referral status, and level of the referring health facility with CS in this study, previous studies conducted in the Democratic Republic of Congo, Kenya, and Tanzania showed a significant relationship between some of these factors and having CS (38, 46, 47). On the other hand, a systematic review and meta-analysis found that women with private insurance were more likely to have CS compared to their counterparts with public insurance (48)

5. Study limitation

There were inadequate numbers of some variables during the analysis for the different categories. This was a cross-sectional study and therefore it cannot derive a causal relationship from

the cross-sectional analysis. Consecutive sampling was used and thus introduced a form of bias.

6. Conclusion

The proportion of CS in this study was 38.3% (123/321). Of these, 110 (89.4%) were emergencies and 13 (10.6%) were electives. Only 8.4% of the respondents were referrals. The commonest indications of CS were fetal distress (28.5%), history of previous CS (18.7%), and poor progress of labour (11.4%).

7. Recommendations

There is the need for caesarean section audits to check whether these CS deliveries were medically indicated at a rural hospital and this may help the hospital to reduce the unnecessary CS if identified.

There is a need to assess the labour monitoring process by health care providers in a rural hospital as fetal distress was the commonest indication of CS delivery and this would help to rule out the issue of over diagnosing or misdiagnosing fetal distress by the staff.

8. Acknowledgment

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10. Ethical approval and consent to participate

Ethical approval was sought from the School of Health Sciences Research and Ethics Committee at Makerere University College of Health Sciences (CHS). Administrative approval was sought from the Medical Superintendent of Kisiizi Hospital in southwestern Uganda. The study procedures, purpose, risks, and benefits were explained to participants before obtaining informed consent. The participants were also informed about confidentiality and privacy measures were put in place for the information collected. Filling in of questionnaires was done in one of the offices in the postnatal ward to ensure privacy.

11. Competing interests

These author (s) declared that they have no competing inter.

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Additionally, Lilian is also the innovator of projects like "Your Nurse and Midwife on Air, The Nurses and Midwives Virtual Community WhatsApp platform, and The Nutrition and Wellness Hub. Almost all these projects focus on equipping the community with evidence-based health information.
Lilian believes in the public health approach for the prevention of diseases, and she thus does community sensitization using various media platforms like writing freely for top tabloids on a wide range of health issues and publishes, conducting free health education talks on televisions, radios, webinars among others. By July 2021, during the 2nd lockdown due to the COVID-19 pandemic in Uganda, pregnant and breastfeeding mothers were not among the priority groups to receive the COVID-19 vaccine. Lilian identified this as a very big problem since these are a vulnerable group and based on the global research and various evidence-based recommendations from developed countries, findings showed that the vaccine benefits outweighed the risks, and hence safe in this group. Lilian didn't sit down and watch this, she thus went ahead and advocated for this special group by writing and publishing in the different media print recommending the GOU through the MoH to include this category of people among the priority groups and held different webinars and press briefs about this. In less than two months, the MoH through the UNEPI department had recognized and included them among the priority groups. Lilian conducts and publishes research in peer-reviewed journals. Her focus is mainly on reproductive maternal newborn child and adolescent health and general nursing and midwifery.
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