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The Demographic and Clinical History as Predictors Contributing to the Prevalence of Caesarean Sections in Ghana: A Facility-Based Study

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Abstract

Caesarean section is an essential clinical obstetric intervention used to reduce maternal and foetal death. Several indications contribute to the decision-making to use CS as a delivery in the clinical environment. This study sought to determine the prevalence of CS at LEKMA Hospital in Ghana and the demographic and clinical history of mothers as predictors for the prevalence. Using a retrospective study design, data for all mothers who had previously given birth at the hospital's obstetric and gynaecological department was used. Multiple logistic regression was applied and a p-value<0.05 with a 95% confidence interval (CI) for results using IBM-SPSS version 25. From the study, the prevalence of CS was 40.6% and the average age for SVD and CS were 28.3±5.94years and CS 29.6±5.50years respectively. The likelihood of those aged 36 years and above undergoing CS was notably higher (AOR; 2.84, 95%CI 1.41-5.3, p-value <0.0001) compared to those aged 26-30 (AOR; 2.45, 95%CI 1.49-4.00, p-value: 0.004) years and 31-35 (AOR; 1.65, 95% CI 0.94-2.90, p-value: 0.080) years. The results further indicated that the risk of undergoing CS was greater among mothers with parity of 1-2 (AOR: 1.56, 95%CI 1.02-2.41, p-value: 0.040). The prevalence of CS in the study is greater than the recommended prevalence per 100 births by the World Health Organization. The sociodemographic and clinical history of a pregnant woman influenced the mode of delivery such that the increase in gestational age and parity decreased the risk of CS. Whiles the educational status and age of the mothers at the time of birth increased the risk of CS delivery.

Keywords*: Caesarean section, Prevalence, Maternal, Indications.*

Introduction

Caesarean section (CS) is one of the obstetric procedures established to reduce maternal and foetal death and morbidity. Like all medical procedures, CS is connected with short- and long-term complications that can last for many years after the current delivery, affecting the health of the woman, the child, and future pregnancies, as well as exposing families to significant healthcare expenses [1] and as such the decision to perform a CS should be based on obstetric history and anticipated mode of delivery [2].

The World Health Organization recommends that unnecessary CS be avoided. It stated that a population-based prevalence of CS above 15% is unjustifiable in any region [3, 4]. Yet CS rates in both developed and developing nations have grown considerably for many reasons [4–6]. Notably, it has been stated that the high CS prevalence recorded in most countries is a low-priority of relevant factors such as enhancing women's abilities to give birth, side effects of common labour interventions, refusal to offer the informed choice of vaginal birth/ spontaneous vaginal delivery (SVD), casual attitudes about surgery and variation in

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professional practice style, limited awareness of harm more likely with CS, and incentives to practice in a manner that is efficient for providers [7].

In a recent survey involving 150 countries,18.6% of all births occurring worldwide are through CS ranging from 6% to 27% in the least to the most developed regions respectively and Africa has an average CS rate of 7.3% with a range of 1.4% to 51.8%. Whiles within the African continent, Western Africa recorded an average range of 1.4-11.4% [5, 8]. In Ghana, it has been reported that the proportion of births delivered by CS increased from 12% in 2007 to 16% in 2017 [8, 9] However, this rate varies among the different regions of the country and also among different health facilities [8]. This study, therefore, sought to determine the facility-based prevalence of CS and its association with the demographic and clinical history of the mothers.

Methods

Study Design and Area

The study employed a facility-based retrospective cross-sectional study design and was conducted at the Ledzokuku-Krowor Municipal Assembly (LEKMA) Hospital. The LEKMA hospital is a 100-bed capacity referral hospital built by the Chinese Government as a China–Ghana friendship hospital in 2010. It is located at Teshie in the Greater Accra region. It has a general hospital's departments, such as a surgical theatre, blood bank, specialist services, radiology units, etc. LEKMA Hospital is the only public/government hospital in the Ledzokuku-Krowor Municipality.

Sampling and Data Collection

A total sampling technique was employed for the study. Records of all women (750) who had given birth at the facility during in the year 2019 were used. Data was collected in year 2022 using a data extraction sheet. The data was cleaned by removing all incomplete records and at the end, 598 records were left which were used for the study.

Operational Definitions

a. Incompletes records are the patient records that have not been filled with the full details of the patient, especially the clinical history and demographic information.

b. Caesarean section is the expulsion of the foetus, membrane, and placental by incision of both the abdomen and uterus.

Data Analysis

The data was analysed using IBM-SPSS version 25. A descriptive statistic was conducted to ascertain the distribution of the various dependent and independent variables. Multinomial logistic regression was conducted to determine the association between the CS and the clinical and demographic data. The p-value of the results was determined as significant when it was below 0.05 and the confidence interval for the study was set at 95%.

Ethical Approval

Ethical approval was obtained from the Ghana Health Service Ethics Review Committee as well as permission was sought from the management of LEKMA Hospital before data collection.

Data Storage and Usage

The data extraction sheet was coded and kept in a secure location by the researcher. The data was then entered on a secured personal computer and backed up on a secure server to prevent loss of data.

Results

Figure 1 shows the prevalence of delivery through SVD and CS. 355(59.4) delivered through spontaneous vaginal deliveries, while 243(40.6) were delivered through caesarean sections.

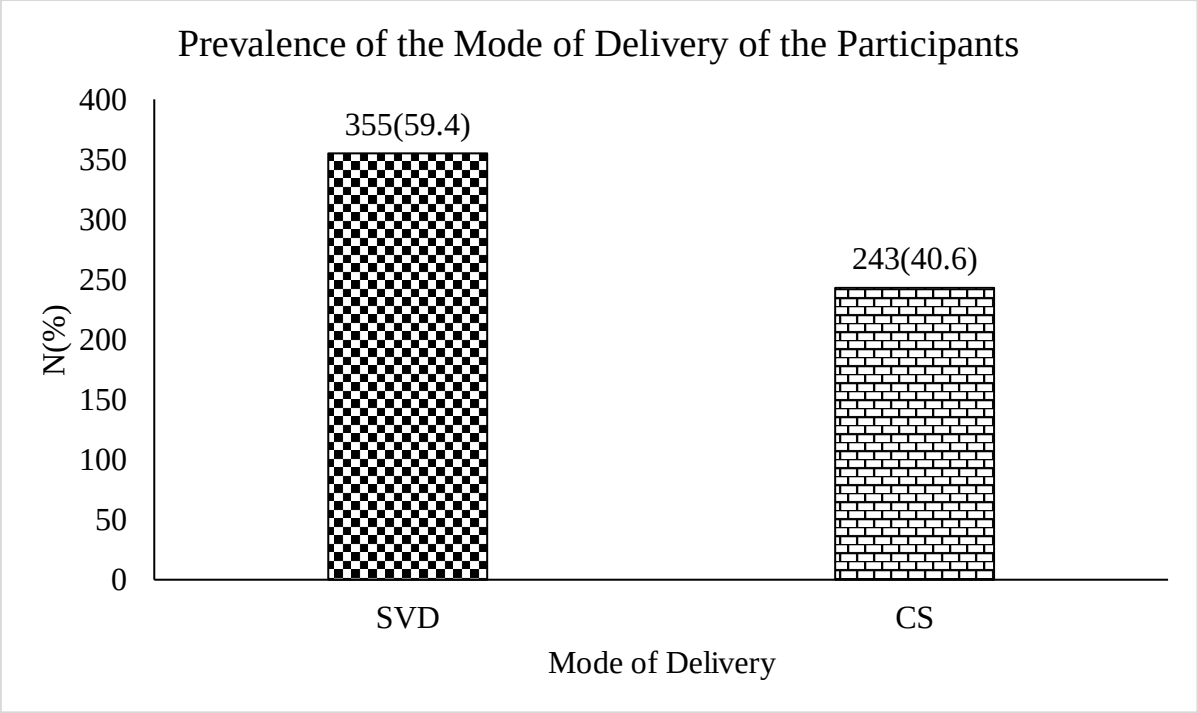

Figure 1. Prevalence of SVD and CS as a Mode of Delivery by the Participants

N (%) = frequency (percentage)

The comparison of the modes of delivery to the socio-demographic and clinical history of the participants revealed that the average age for SVD was 28.3±5.94years and CS was also 29.6±5.50years. Significantly, most of the participants that delivered through SVD were aged 25 years and below, 119(33.5) while those that delivered by CS were mostly aged between 26-30years, and 103(41.2). The likelihood of those aged 36 years and above (AOR;2.84, 95%CI 1.41-5.3, p-value <0.0001) undergoing CS was notably higher compared to those aged 26-30 (AOR; 2.45, 95%CI 1.49-4.00, p-value: 0.004) years and 31-35 (AOR; 1.65, 95% CI 0.94-2.90, p-value: 0.080) years using the age group 25 years and below as a reference. Although insignificant statistically (p>0.05), most of the participants that delivered either through SVD or CS were employed, 295(83.1) and 201(81.7) respectively. Term deliveries (182(51.3) SVD and 151(62.1) CS) were more in than preterm (31(8.7) SVD and 32(13.2) CS) or post-term (142(40.0) SVD and 60(24.7) CS) irrespective of the mode of delivery. Among previous births, the least for SVD and CS were among those that had had parity of around 3 or more, 56(15.8) and 27(11.1) respectively. It is also interesting to note that the risk of undergoing CS was greater among mothers with 1-2 births (AOR: 1.56, 95%CI 1.02-2.41, p-value: 0.040) than mothers with 3 or more previous births (AOR:0.65. 95%CI 0.33-1.28, p-value: 0.210). Table 1.

Table 1. A Multinomial Logistic Regression of Deliveries by CS and a Comparison of the Modes of Delivery Across the Socio-Demographic and Clinical History of the Participants

Variable	**SVD (n=355)**	**C/S(n=243)**	**Total (N=598)**	***P***	**Delivery by CS**	
Age (n±SD)	28.3±5.94	29.6±5.50	28.9±5.8		AOR (95% CI)	*P*
Age Groups						
25yrs and below	119 (33.5)	48 (19.8)	167 (27.9)	*0.002*	Ref	-
26-30yrs	109 (30.7)	100 (41.2)	209 (34.9)		2.45(1.49-4.00)	*0.004*
31-35yrs	86 (24.2)	61 (25.1)	147 (24.6)		1.65(0.94-2.90)	0.080
36yrs and above	41 (11.5)	34 (14.0)	75 (12.5)		2.84(1.41-5.73)	*<0.0001*
Occupational Status						
Employed	295 (83.1)	196 (81.7)	491 (82.1)	0.653	Ref	-
Unemployed	42 (11.8)	35 (14.4)	77 (12.9)		1.53(0.88-2.67)	0.175
Student	18 (5.1)	12 (4.9)	30 (5.0)		1.80(0.77-4.23)	0.130
Education Status						
None	33 (9.3)	43 (17.7)	76 (12.7)	*<0.0001*	Ref	-
Primary	17 (4.8)	5 (2.1)	22 (3.7)		0.19(0.06-0.60)	*0.005*
Junior High School	124 (34.9)	68 (28.0)	192 (32.1)		0.43(0.24-0.76)	*0.004*
Senior High School	101 (28.5)	54 (22.2)	155 (25.9)		0.41(0.22-0.74)	*0.004*
Tertiary	80 (22.5)	73 (30.0)	153 (25.6)		0.57(0.31-1.05)	*0.074*
Gestational Age						
Preterm	31 (8.7)	32 (13.2)	63 (10.5)	*<0.0001*	1.09(0.6-1.94)	0.758
Term	182 (51.3)	151 (62.1)	333 (55.7)		Ref	-
Post-term	142 (40.0)	60 (24.7)	202 (33.8)		0.47(0.32-0.70)	*<0.0001*
Parity						
None	133 (37.5)	69 (28.4)	202 (33.8)	*0.004*	Ref	-
1-2 births	166 (46.8)	147 (60.5)	313 (52.3)		1.56(1.02-2.41)	*0.040*
3 or more births	56 (15.8)	27 (11.1)	83 (13.9)		0.65(0.33-1.28)	0.210

n= number of participants, N= Total number of participants, P<0.05 implies statistically significant, AOR= Adjusted Odds Ratio, 95%CI= 95% Confidence Interval, Ref= Reference category

Discussion

Goal five of the millennium development goals are geared towards the reduction of maternal deaths by 75% but this goal remains a challenge, especially in developing countries [10]. Despite the WHOs recommendations on the required percentage for CS, this risky although live-saving intervention is still on the rise [4, 5, 11]. This study sought to understand the clinical and demographic factors contributing to CS's prevalence at LEKMA hospital. The CS prevalence of 40.6% found in this study was above the 10-15 per cent agreed upon by WHO experts [12], as well as the findings of Prah et al in 2017 in Ghana and Hailegebreal et al from southern Ethiopia in 2019 which reported a CS prevalence of 26.7% and 5.4% respectively [5, 13]. It was also higher than the findings of multiple studies across the continent [14, 15].

In similar studies conducted in Nepal and Ghana respectively, participants below the age of 25 were the second largest group of participants recruited and their report was similar to the finding of this study. They reported

that the risk of undergoing a caesarean section was significantly greater in the old compared to the young, thus agreeing with our report [16, 17]. Furthermore, a previous Nigerian study reported that participants between the ages of 25-34years for the study were the highest to deliver both vaginal and caesarean yet the risk of undergoing a caesarean section was greater among those aged 35 years and above in that study [18]. Previously published studies have reported that an increase in maternal age is correlated with developing obstetric complications, including death and perhaps these factors were possibly operative in determining the high level of CS seen in this study [16, 19, 20].

Employment differences stratified across the two modes of delivery in this study indicated that most participants of this study were employed although this was statistically insignificant. A similar report was also made by an earlier study conducted in Ghana (89% employed) [5]. Yet, in another study conducted in Nigeria (61.4% were employed), a statistically significant ($p<0.05$) difference was observed between the modes of delivery and the employment status of the participants [18]. Additionally, while this study found no significant risk between the modes of delivery of the employed and the unemployed, the Nigerian work reported that the risk of undergoing CS was greater in the employed than the unemployed [18]. Lack of funds on the part of the unemployed influenced the low levels of CS among them since previous studies have established links between wealth and CS [14, 16, 17, 21].

In regard to education, while most participants in this study were tertiary-level educated (30.0%), only a few participants in recent studies in Ghana (7.9%) and Nepal (15.4%) were tertiary-level educated [16, 17]. Even so, another study conducted in Ghana (40.2%) and Southern Ethiopia (42.0%) recorded the highest number of tertiary-educated participants and thus agreed with this study [1, 5]. Furthermore, whiles Junior High School (JHS) completed participants (34.9%) were the group that mostly delivered vaginally, tertiary educated participants (30.0%) were the group that majorly delivered by CS in this study. Ahmed et al also reported that most participants that underwent both CS and SVD were secondary level educated and this was significant statistically [22]. Whiles Prah et al reported that most CS was done by tertiary-level educated participants as in this study [5]. Importantly, an increase in the level of education increased the possibility of a caesarean section in this study and this finding confirmed reports from earlier studies sub-region [3, 14, 18, 21, 23, 24]. Perhaps the ability to read and write provides the educated an advantage to make informed choices and as such the high rise of CS in this study could just be associated with a maternal-informed choice other than medical.

Concerning the gestational age of the participants, the findings of this study agreed with various studies in which most participants delivered termly [4, 5, 15]. However, while preterm deliveries were the least in this study, there was a disparity between this study and the studies conducted by Shit et al 14(5.6) and Tarimo et al 32(4.0), which recorded the least gestational age at the time of delivery being post-term [4, 15]. While a Northern Tanzanian study reported that the group to least deliver by CS was post-term [15]. To add to this, this current work reports that although insignificant, the possibility of undergoing CS was 1.09 times greater in preterm mothers. A finding that supports previous data that stated that CS delivery risk was greater among preterm or second-trimester maternal deliveries than to term or post-term deliveries [4, 21, 23].

Prah et al reported earlier in Ghana that about 40% of the participants in their study were primiparous whiles this study reported 33.8%. The differences between these two studies could be a result of the differences in the study site because while this study was conducted at the LEKMA hospital in the Greater Accra Region which attends to several different people, the Prah *et al* study was conducted at the University

of Cape Coast Hospital which attends to most people of the university community. Like earlier works, whether participants delivered through SVD or CS, most of them in this study had at least one previous birth [2, 5]. Parity as a determinant for CS in this study was inversely associated such that as parity increased, the risk of CS decreased. This finding concurs with earlier reports which further stated that parity is a beneficial mechanism to decrease the risk of CS and other birth outcomes [7, 16, 21, 25–27].

Conclusion

In conclusion, the prevalence of CS in this study is greater than the recommended prevalence per 100 births by the World Health Organization and the national average for caesarean sections. Also, certain demographic factors and clinical history are determinants when CS delivery is the subject. Clinical history such as gestational age at the time of birth and parity positively impacted the risk of CS deliveries in pregnant women. Therefore, clinical and demographic data of pregnant mothers are strongly modulated by the mode of delivery.

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Conflict of Interest

The author declares no conflict of interest.

Reference

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