



# **Perception Of Women Of Child Bearing Age Regarding Caesarean Section At Methodist Faith Healing Hospital Ankaase Kumasi**

<sup>1</sup>Williams Selinah Atamunodukobia Vestal Ibiateli; <sup>2</sup>Grace Jonathan Ekong; <sup>3</sup>Grace Asomaning &  
<sup>4</sup>Dagogo-Brown Igirigi Deinabobo

<sup>1</sup>University of Port Harcourt Teaching Hospital, Rivers State, Nigeria  
[williamsselinah@yahoo.com](mailto:williamsselinah@yahoo.com)

<sup>2</sup>University of Uyo, Akwa Ibom State, Nigeria  
[graceekong4@gmail.com](mailto:graceekong4@gmail.com)

<sup>3</sup>Garden City University College, Kenyasi, Kumasi, Ghana

<sup>4</sup>Faculty of Nursing Science,  
Federal University Otuoke, Bayelsa State, Nigeria  
[igidagogo@yahoo.com](mailto:igidagogo@yahoo.com)

## **ABSTRACT**

Caesarean section is a commonly performed obstetric operation in the world that has immensely improved delivery outcomes throughout the world. However, the acceptability of this surgical procedure varies quite significantly at different parts of the world, the lowest being in Sub-Saharan Africa. The study determined the perception of women of Child bearing age regarding Caesarean section. An exploratory study design was conducted at the Methodist Faith Healing Hospital Ankaase in the Afigya Kwabre Region of Kumasi, Ghana. The study involved women of child bearing age, selected from the Antenatal clinic through a simple random technique for two (2) days. A total of thirty (30) women were interviewed using an interview guide with semi-structured questionnaire to collect data. Data was analyzed descriptively using SPSS version 22. The study documented varied erroneous perceptions about caesarean section among the women studied. Some negative perceptions expressed included caesarean section being abnormal, excruciatingly painful, potentially fatal, reducing strength and highly prone to infection. Some of the women also perceived caesarean section to results in very low recovery following delivery. Most of the women however disclosed that health education about caesarean section at the Antenatal clinic was not enough. The study reveals the necessity to explore expanded mode of patient education on caesarean section.

**Keywords:** Caesarean section, Childbearing age, Perception, Women.

## **INTRODUCTION**

Caesarean section is the most commonly performed major obstetric operation in the world, and there is no doubt that it has contributed to improved obstetric care throughout the world. Caesarean section is usually performed when vaginal birth is deemed hazardous either to the fetus or the mother. While this procedure is highly accepted and practiced in some parts of the world, some reluctantly accepted even in the face of

obvious clinical indication. The trend of acceptability and the rate of caesarean section have been on the increase in the developed countries (Adeoye & Kalu, 2011).

Consequently, Danso et al. (2009), reports that the rate of caesarean section in Europe and North American have been increasing, United states of America currently has an average rate of 26.1%, United Kingdom 20%, Australia 20-30%, Italy 30%, South Korea 40%, Singapore 20% and Brazil 20-50%. Conversely in the developing countries, the change in the Caesarean section rate has been less dramatic (2%) during the same period. This results from the negative perception of caesarean section among women in the developing countries. Hence caesarean section rate in sub-Saharan African countries like Burkina Faso, Niger, Nigeria and Ghana is as low as 2%. Adeoye and Kalu (2011), also reported that among women in the developing countries, caesarean section is still being perceived as a curse on an unfaithful women and the lot of weak women. In study among women of southern Nigeria, caesarean section was viewed with suspicion, aversion, misconception, fear, guilt, misery and anger.

In Ghana, as in most sub-Saharan African countries, it has been suggested that women accept caesarean section reluctantly even in the face of obvious clinical indication. It is recorded that only 4% of live births are by caesarean section delivery and this figure has not changed significantly since 1998 (Ghana Medical Journal 2003). The negative view of caesarean section by women in the developing countries has led to gross underutilization of the procedure compared to large burden of obstetric morbidity requiring resolution to caesarean section (Adeoye & Kalu 2011).

Mboho et al. (2013), states that despite the causes of maternal mortality often obstetric in origin, underlying cultural factors and belief also affect access to and use of health facilities and thus contributes to avoidable maternal death. There is a marked decrease in caesarean section in the developing countries (2%) whereas the developed countries increase (40%). This study will explore the perceptions of woman of child bearing age regarding caesarean section, where the findings will serve as a guide to improve the attitude of pregnant women towards acceptance of caesarean section when necessary.

Unlike the developed countries where there is an increase in demand for caesarean section, this is reluctantly accepted in the developing countries of which Ghana is included. This may be due to ignorance or counterproductive traditional beliefs women have about caesarean section. An evidence from the Methodist Faith Healing Hospital, Ankaase revealed an increase in emergency caesarean section in the year 2015 (251) over elective caesarean section (136). This is because women who were counseled for caesarean section opted to go home for home delivery rather than going for the surgery and ended up having emergency caesarean section.

Whereas there is an increase in caesarean section in the developed countries such as United States, Australia and Italy, there is a decrease in the sub-Saharan African countries like Burkina Faso, Nigeria and Ghana (World Health Organization (WHO) Annual Report, 2007). A study on perception of women of child bearing age regarding caesarean section will be of great benefit where the women's views about caesarean section will be discovered and appropriate measures taken to address the wrong perceptions. This study therefore, seeks to determine the perception of women of child bearing age regarding caesarean section in the Methodist Faith Healing Hospital Ankaase, Kumasi. The study provided answers to the following research questions:

1. What is the knowledge about caesarean section?
2. What are their sources of information about the caesarean section?
3. What is the preferred choice of mode of delivery for the women?
4. What are the things that prevent acceptance of caesarean section?

## **METHODOLOGY**

An Exploratory study design was adopted for the study with a population consisting of women of child bearing age from the antenatal clinic of the Methodist Faith Healing Hospital in Ankaase. A sample size of thirty (30) women was chosen from the antenatal attendants in Methodist Faith Healing Hospital. A simple random sampling of the probability sampling technique was used to select respondents. Data was collected using an interview guide with semi-structured questionnaire to collect data. The questionnaire is in two sections, section A measured the demographic information of the respondents while section B of

the questionnaire measured the knowledge and perception of women of child bearing age on caesarean section. Data was collected on two visits (2 days) and data analyzed with a descriptive statistic.

**Ethical Considerations**

An introductory letter from Garden City University College through the Dean of Students Affairs was given. This was then taken to the management of Methodist Faith Healing Hospital where permission was given to have access to the study population. The main areas of concern in ethical involvement with participants included the issues of privacy, anonymity and confidentiality. The researcher upheld the integrity of the participants and their rights. Informed consent was obtained and procedure explained to the participants before administering the research questions.

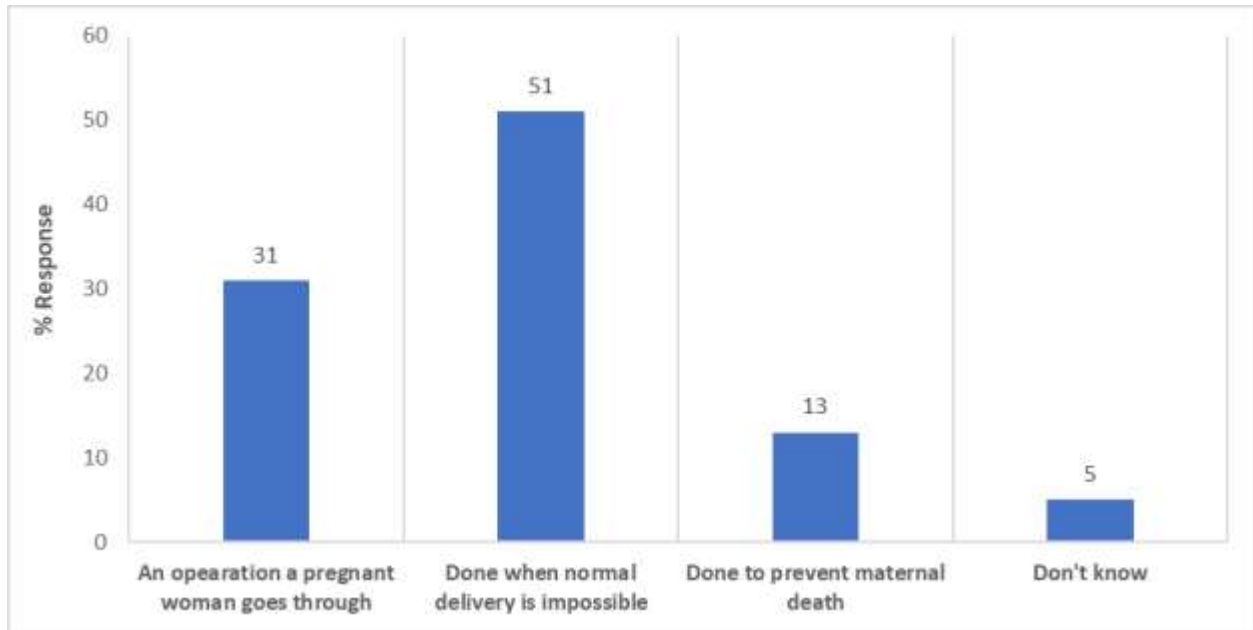
**RESULTS**

The results of the study are shown below:

**Table 1 Background characteristics of respondents**

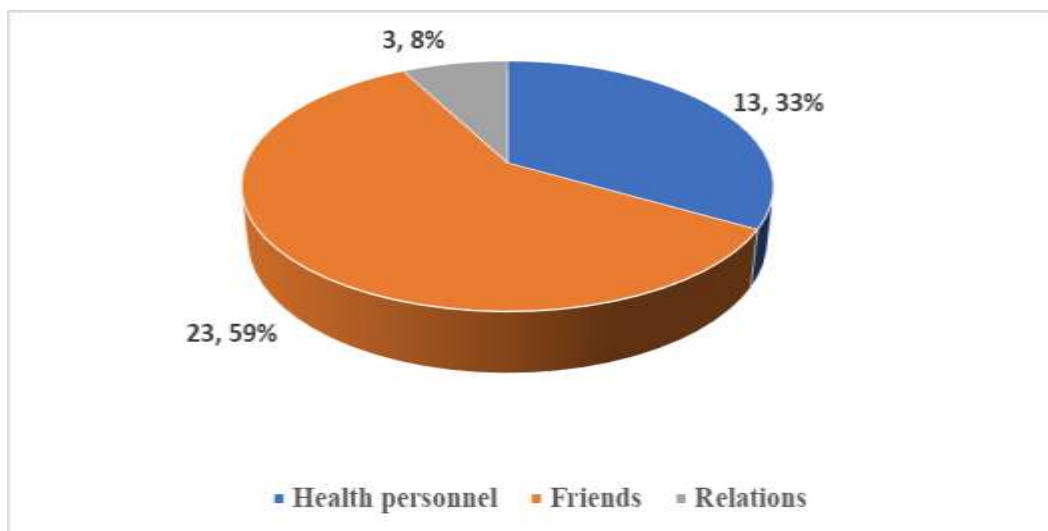
Variables	Frequency N=39	Percentage
<b>Age, years</b>		
- 18 – 24	10	25.6
- 25 – 30	12	30.8
- 31 – 35	9	23.1
- 36 and above	8	20.5
<b>Marital status</b>		
- Married	27	69.2
- Single	12	30.8
<b>Employment status</b>		
- Employed	28	71.8
- Unemployed/student	11	28.2
<b>Occupation (n=28)</b>		
- Trader	15	53.6
- Self- Employed	9	32.1
- Civil servant	4	14.3
<b>Education</b>		
- Basic	26	66.7
- SHS/Vocational	3	7.7
- Tertiary	7	17.9
- No formal Education	3	7.7
<b>Religion</b>		
- Christianity	30	76.9
- Muslim	9	23.1
<b>Number of children</b>		
- None		
- 1 - 2		
- 3 - 4	9	23.1
- 4 and above	14	35.9
	13	33.3
	3	7.7

As shown in Table 1, majority of the respondents were 30years and below. Specifically, 25.6% were from 18 to 24years, while 20.5% were above 36years. Twenty-seven women, representing 69.2% of respondents were married and 34 women, constituting 87.2% were employed. Among those employed, 15 (53.6%) were traders, 9 (32.1%) were self-employed while 4 (14.3%) were civil servant. About two-thirds (66.7%) had basic education whereas only 7.7% had tertiary education. Most, 76.9% were Christians and more than 70% had one child or more as detailed in Table 4.1.



**Figure 1 Knowledge and understanding of caesarean section**

Figure 1 shows the knowledge and understanding of the women about caesarean section. About half, 51% believed caesarean section is performed on a pregnant woman when normal delivery is impossible (Figure 4.1). About 31% also opined that it is simply an operation a pregnant woman goes through. 5% of the women however had no idea of caesarean section.



**Figure 2 Sources of information**

As shown in Figure 2, the most cited source of information about caesarean section was friends (59%). Health personnel and family relations constituted 33% and 8% respectively.

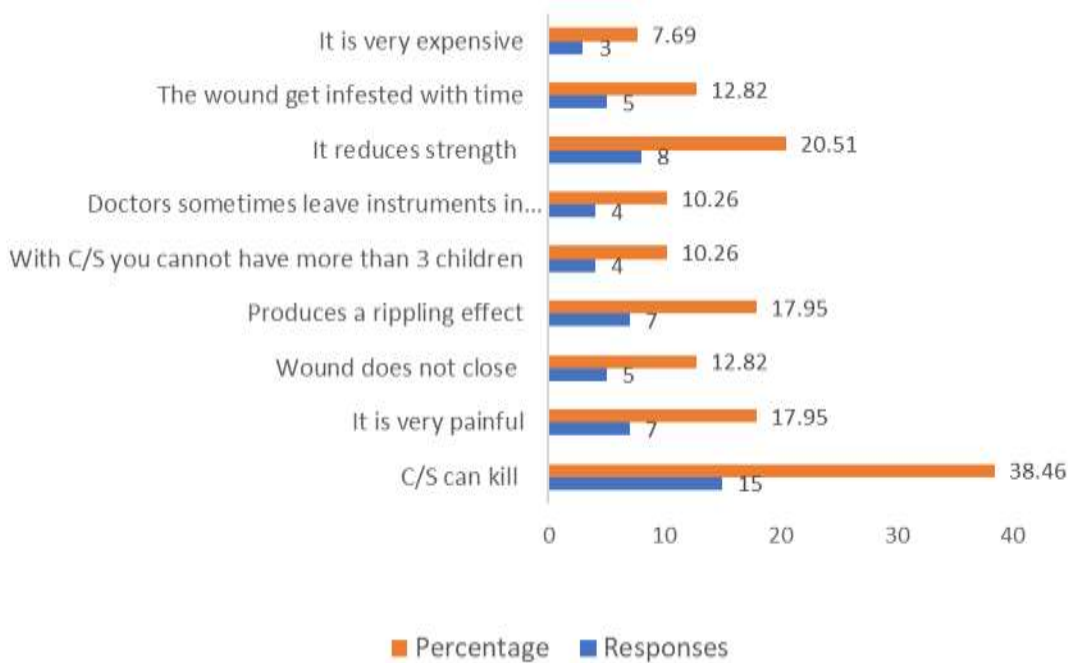
**Table 2 Preferences for caesarean section**

Variables	Frequency N=39	Percentage
<b>Ever had caesarean section</b>		
- Yes	9	23.1
- No	30	76.9
<b>Preferred mode of delivery</b>		
- Vaginal delivery	36	92.3
- Caesarean section	3	7.7
<b>Reasons for preferring vaginal delivery</b>		
- Difficulty in going to normal work after delivery with caesarean section	2	5.1
- Caesarean section is painful	6	15.4
- Caesarean section is expensive	4	10.2
- Caesarean section deteriorate health condition and reduces strength	8	20.5
- Caesarean section restricts number of children one can have	4	10.2
- No more pain after vaginal delivery	4	10.2
- Vaginal delivery promotes strength and good health	6	15.4
- Quick to recover after vaginal delivery	5	12.8
<b>Reaction on need to undergo caesarean Section</b>		
- Accept	27	69.2
- Reject	12	30.8
<b>Traditional and religious beliefs influence your choice of mode of delivery</b>		
- Yes	2	5.1
- No	34	87.2
- Can't tell	3	7.7
<b>Get enough education on caesarean section during antenatal visits</b>		
- Yes	20	51.3
- No	16	40.0
- No education	3	7.7

As shown in Table 2, only 23.1% of the women interviewed had ever gone through a caesarean section. More than 90% of the women would however prefer vaginal delivery to caesarean section. The reasons offered for their preference for vaginal delivery were difficulty in going to normal work after delivery with caesarean section (2 responses; 5.1%), caesarean section is painful (6 responses; 15.4%), caesarean section is expensive (4 responses; 10.2%), caesarean section deteriorate health condition and reduces strength (8 responses; 20.5%), caesarean section restricts number of children one can have (4 responses; 10.2%), no more pain after vaginal delivery (4 responses; 10.2%), vaginal delivery promotes strength and good health (6 responses; 15.4%) and quick to recover after vaginal delivery (5 responses; 12.8%).

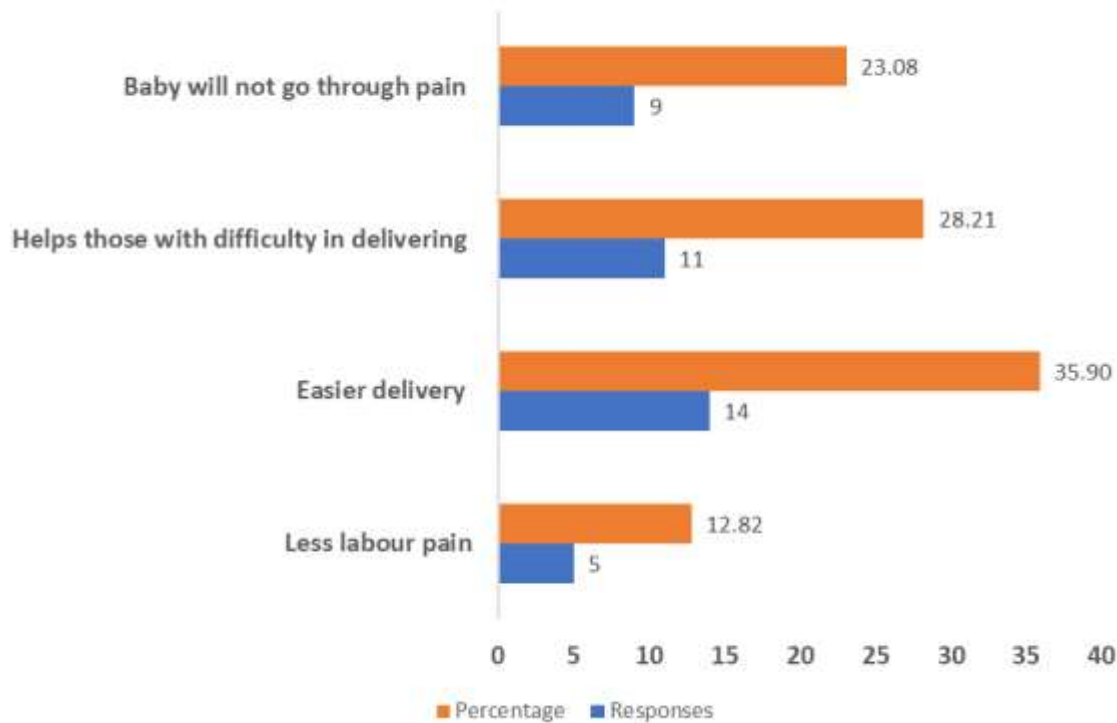
Although most of the women would prefer vaginal delivery to caesarean section, most, 69.2% would accept to undergo caesarean section when there is the need to do so. The reasons cited for refusing caesarean section were fear (7 responses), not being able to work alone after caesarean section (3

responses) and not being able to live normal life after the operation (2 responses). Most of the women, 87.2% believed that traditional beliefs do not influence their choice for mode of delivery while 7.7% were not certain of that. About 51% disclosed that they do get enough education on caesarean section when they visit antenatal clinic whereas 40% responded otherwise. Three women (7.7%) however stated that they do not get any education on caesarean section.



**Figure 3 Negative views and ideas about caesarean section (multiple responses)**

Figure 3 illustrates the negative ideas the women have been exposed to regarding caesarean section. The most cited negative idea was “caesarean section can kill” (38.5%). About 20.5% and 18.0% also stated that they have been told that caesarean section reduces strength and it is painful respectively. Four women (10.26%) also indicated that they have been informed that doctors sometimes leave operative instruments in their abdomen after the caesarean section whereas 12.8% stated that the wound after caesarean section gets infested with time.



**Figure 4 Positive views and ideas about caesarean section**

On the other hand, the women had heard some positive ideas regarding caesarean section as shown in Figure 4. About 14 (35.9%) were informed that caesarean section is an easier mode of delivering whereas 11 (28.2%) and 5 (12.82) had also been informed that caesarean section is helpful for those with delivering difficulties and also involves less labour pain respectively. The women further expressed their opinions on way to improve awareness and acceptance of caesarean section among pregnant women. Most of the women (28; 71.8%) believed this could be done through increased health education whiles 6 women (15.4%) added that the education about caesarean section should be done during the early days of antenatal care to prepare their minds during the pregnancy period.

## DISCUSSION

This study recorded a low prevalence and acceptance level of caesarean section among the women interviewed. Only 23.1% had ever gone through a caesarean section and more than 90% would however preferred vaginal delivery to caesarean section. This corroborates findings from a study carried out in Komfo Anokye Teaching Hospital in Ghana by Adageba et al (2009), on the awareness and perception of and attitude towards caesarean delivery, which reported that 93.3% preferred vaginal delivery, 11% preferred planned caesarean delivery and the remaining 3.2% were undecided.

This outcome is consistent with reports from other developing countries that highlights low caesarean section rate in these countries. As put forward by Qazi et al (2013), changes in caesarean section rate in the developing countries have not been substantial, with most women still perceiving it as an abnormal means of delivery. This has resulted in underutilization of the procedure in these regions, with some sub-Saharan African countries recording as low as 2% rate of utilization, despite the huge burden of obstetric morbidity. This points to the need to adopt measures to improve women understanding and encourage them to accept this procedure when necessary.

Previous evidence however suggests an increase in the utilization of caesarean section in industrialized countries. The rate of caesarean section in Australia for instance, is shown to increase by 10% from 1998 to 2007 (Qazi et al, 2013). Similar trend was also observed in the USA, with an increase from 20.7% in 1996 to 31.1% in 2006. Report by the World Health Organization (WHO), showed that caesarean section account for 1: 10 child births (WHO 2009). Greater increase in rate of caesarean section was also observed in the UK from 2007 to 2008. Birth rate via caesarean section is currently 37.8% in Italy and 35.2% in Taiwan as at 2007. The increased rate of caesarean section acceptance and utilization in developed countries could be attributed to increased understanding among the populace and this could also account partly for the control and reduction of maternal mortality in these countries.

This study also revealed varied reasons why women in the study area would prefer vaginal delivery to caesarean section procedure. These were related to either a negative implication of caesarean section or a perceived benefit of vaginal delivery over caesarean section. The most cited reason for their preference was caesarean section leading to deterioration of health condition and reducing strength (20.5%). Other reasons included the procedure being painful (15.4%), expensive (10.2%) and caesarean section restricting number of children one can have (10.2%). Some of the women will also opt for vaginal delivery over caesarean section because they believe it promotes strength and good health (15.4%) and recovery after vaginal delivery is quicker (15.4%).

These reasons however might not represent the entire truth about caesarean section, but rather cultural and societal beliefs that influence the perceptions of women, therefore the need to educate these women to improve their understanding. The perception that caesarean section is painful for example cannot be entirely true as anesthesia is being developed and improved to relieve pain during caesarean section. Regional anesthesia, including spinal and epidural have for instance been developed and become popular methods of relieving pain and improving outcomes after caesarean section (Ananya Mandal, 2014). As put forward by Roudsari (2015), culture has a significant impact on people's perceptions and attitudes towards labor pain, definition of labor pain, coping mechanisms against pain, and related behaviors and this influence their decisions about mode of delivery.

Knowledge level is recognized as important determinant of health utilization. Previous evidence has established a positive link between improved education and understanding and positive attitudes towards health. In this study, only 5% of the women had no idea of caesarean section whereas the majority understood caesarean section as an operation performed on a pregnant when normal delivery is not possible. The level of knowledge could be influenced by many factors including the cultural norms and societal values. In a qualitative study by Zakerhamidi et al (2014), economic issues, previous experience of child birth and vaginal delivery facilitators were associated with the choice of vaginal delivery. The study also revealed that the knowledge recipient of caesarean section possesses affect them to give informed consent to the procedure.

The accuracy and reliability of health information depends on the source of the information. As suggested by Aziken et al (2011), the perceptions surrounding caesarean section may have a significant role in the willingness to consent to such a procedure. These perceptions are driven by the information women receive from diverse sources, which may vary in accuracy and reliability. Failure to ensure that patient receive accurate information may result in some women refusing a caesarean section, which may be necessary to prevent both maternal and fetal risks.

Health workers are known as the prime source of accurate health information to impact decision making and improve health behaviors. In rural and deprived communities, where access to healthcare is limited, lay or community health workers are trained and equipped to serve as the main source of health information to the communities (Nxumalo, Goude and Thomas, 2013). In this study, most of the respondents cited friends as the source of health information, followed by health personnel. This means that the perceptions and attitudes of these women towards caesarean section would be greatly influence by their peers, whose views are subjected to cultural norms and beliefs, rather than relying on accurate information from health personnel and that could partly account for the increased negative perceptions



about caesarean section among these women. It is therefore imperative to ensure women have access to the right information to inform their decision on caesarean section.

Perception about health is also an important factor in seeking health. Perception about health practices and services influence choice of health services and decision to accept or reject certain procedures. Women's decision to accept or reject caesarean section is also subjected to their perception and believes about caesarean section. As reported by Aziken et al (2007), wrong cultural assumptions about delivery are the main reasons for the mother's refusal to undergo caesarean section, regardless of its necessity. A study by Black (2005), in the United Kingdom found that one of the most important determinants was the individuals' inclination towards vaginal delivery, which is influenced by factors including interest in experiencing vaginal delivery, previous positive experiences, lack of anxiety about the safety of mother and baby, faster recovery after delivery, and fear of anesthesia.

In this study, some women would still refuse to undergo caesarean section even when there is the need to do so. Reasons cited for this decision included fear and perception of not being able to live normal live after the procedure. Some negative views that the women had been exposed to regarding caesarean section also included caesarean section being painful, fatal, reducing strength and the operative wound getting infested with time. Some of the women also perceived caesarean section to result in late recover after birth. These negative perceptions would obviously impact negatively on their attitude towards caesarean section. The outcome of this study is consistent with a qualitative study by Kasai (2008) on women's beliefs about mode of delivery in Teaching Hospitals of Brazil, where most women prioritized natural birth due to faster recovery after delivery. Similarly, the results from the study by Brown et al (2010), among Somali resettled adults in Rochester, New York, revealed aversion to or outright fear of cesarean sections because of fear of death and substantial resistance regarding other obstetrical interventions.

Some positive perceptions regarding caesarean section documented in this study includes caesarean section being an easier mode of delivering, being helpful for those with delivering difficulties and also involves less labour pain respectively. The perception of less pain in caesarean section and its influence on women's decision to accept the procedure is also reported in the study Kasai (2008) in Brazil. This perception is also known to be very prevalent in developed countries and could account for increase rate of caesarean section in that setting.

Majority of the women in this study believed that traditional and religious believes do not influence their choice for mode of delivery. This however is inconsistent with most findings from similar settings that show the important role of religion and tradition in women's views and perceptions about healthcare. In sub-Saharan Africa, most believes and perceptions about healthcare are deep rooted in traditional and religious beliefs. A qualitative analysis conducted by Nnanna et al (2015) in a Missionary Hospital in North-central Nigeria, for instance, revealed that socio-cultural meanings informed by gender and religious ideologies, the relational consequences of having a caesarean section, and the role of alternative providers are some key factors which influence when, where and whether women will accept caesarean section or not. In their study, vaginal delivery appears to be a symbol of womanhood. The respondents in this study, including providers and women who had undergone caesarean section exhibited deeply rooted cultural beliefs. This included the belief that 'true women give birth through vaginal delivery'. This implies that, for such a community, vaginal delivery plays a gate keeping role to being described as a 'true' or 'proper' woman. This construction could limit a woman's consideration caesarean section even when there is the need to do so. Adeoye and Kalu (2011) also reported that, in some developing countries, caesarean section is still being perceived as a "curse" of an unfaithful woman and it is seen among women who are not strong enough to go through the stress of labour.

Health education plays an important role in shaping views and demystifying negative perceptions about certain health practices. In this study, about half of the respondents however do not get enough education on caesarean section when they visit antenatal clinic whiles about 7.7% do not get any education on caesarean section. Most of the women recommended improved health education as a way to increase the level of acceptance of caesarean section in the study area. Previous evidence has also demonstrated a link

between high rate of awareness of caesarean section and the level of education of respondents (Eifediyi et al, 2015). Similar to a study conducted at the Komfo Anokye Teaching Hospital (Adageba et al 2008), most of the women involved in this study wanted caesarean section to be part of client education at the antenatal clinic.

## CONCLUSION

Based on the findings of the study, it was concluded that, there was a low prevalence rate and acceptance level of caesarean section among the women interviewed. Most women would prefer vaginal delivery to caesarean section and these preferences were related to a negative implication of caesarean section or a perceived benefit of vaginal delivery over caesarean section. However, there was a varied negative perception about caesarean section among the women studied.

## RECOMMENDATIONS

This study recommends that;

### *District Health Directorate*

- Health education on cesarean section should be an integral part of antenatal care delivery in all health facilities. This should be continuous to ensure that all pregnant women have access to this information to inform their decision on choice of delivery mode during birth.
- The District health directorate should monitor and supervise the various health facilities to ensure that their antenatal clinics provide this very important information to pregnant women.

### *Health facility and community*

- At the facility level, health information about caesarean section, its risks and benefits should be part of all health education at the antenatal clinic. Management at the health facilities should monitor to ensure the effectiveness of this programme.
- There is also the need for public enlightenment and programmes in the community through the community heads and the radio stations to disabuse many negative perceptions about caesarean section and to reduce the number of women declining to undergo this procedure.

## REFERENCES

- Adeoye, I. S. I. & Kalu, C.A. (2011). Pregnant Nigerian Women's view of Caesarean section. *Nigerian Journal of clinical practice*; 2011 Jul-Sep: 14 (3), 276-9 doi:10.4103/1119-3077.86766.
- Adageba, R., Danso, K., Adusu-Donkor, A., & Ankobea-Kokroe, F. (2008). Awareness and Perceptions of and Attitudes towards Caesarean Delivery among Antenatal. *Ghana Medical Journal*, 42(4), 137–140.
- Aziken, M, Omo- Aghoja, L & Okonofua, F. (2007). Perception and attitudes of pregnant women towards caesarean section in Urban Nigeria. *Acta Obstet Gynaecol Scand* 2007, 86(1): 42-7.
- Brown E, Caroll J, Forgarty C, Holt C (2010). University of Rochester Medical centre, Rochester NY 14620. Somalis women fears on obstetrical intervention in United States.
- Danso KA, Schwandt HM, Turpini CA, Seffah JD, Samba A, Hindin MJ (2009). Preference of Ghanaian Women fo Vaginal or Caesarean Delivery Postpartum. *Ghana Medical Journal*: 43 (1).
- Ghana Statistical service (GSS), Noguchi Memorial Institute for Medical Research (NMIMR), and ORC Marco. Calverton, Maryland: GSS, NMIMR, and ORC Marco; 2003.
- Cochrane database for systematic reviews (3). CDOOO 166.
- Kasai, KE, Keila, RP, Roseli, Nomura, RM, Cikucia, MD, Benute, RG, Mara, C.S. de Lucia, Zugaib, M. (2008). Women's opinions about mode of birth in Brazil: a qualitative study in a public teaching hospital. *Midwifery*. 2010; 26:319-26. [PudMed].
- Mboho, M., Christine, F., & Heather, W. (2013). Socio-cultural practices and beliefs influencing maternal mortality. *African Journal of Midwifery and Women's Health*. Vol. 7: Issue. 1: Pages.26-27. DOI: 10.12968/ajmw.2013.7.1.26

- Nnanna U. Ugwu and Bregie de kok. (2015). Socio-cultural factors, gender roles and Ideologies contributing to Caesarean Section refusal in Nigeria. *Repro Health* 2015; Augu 12: doi 10.1186/s12978-015-0050-7.
- Nxumalo N, Goude J, Thomas L (2013). Outreach Services rove access to health care in South Africa: Lessons from three community health worker programmes. *Glob Health Action* 2013, 6: 19283.
- Qazi Q, Akhtar Z, Khan K, Khan AH (2013) Pregnant Women View Regarding Caesarean Section in North Pakistan. *Trop Med Surg*1: 105.doi:10.4172/2329-9088.1000105 *Trop Med Surg ISSM*: 2329-9088 TPMS, an open access journal Volume 1. Issue 1 .1000105.
- Roudsari, R.L., Maryam Zakeriharmidi, Effat Marghati Khoei, (2015). Socio-cultural Beliefs, Values and Traditions Regarding Women's Preferred Mode of Birth in the North of Iran. *Int J community based nurs midwifery*. 2015 Jul; 3(3): 165-176.
- WHO (2009). Moore B. Appropriate technology for birth. *The Lancet*. 1985; 326:787
- Zakeriharmidi, Effat Marghati Khoei, (2015). Socio-cultural Beliefs, Values and Traditions Regarding Women's Preferred Mode of Birth in the North of Iran. *Int J community based nurs midwifery*. 2015 Jul; 3(3): 165-176.