Factors Affecting mode of Child birth at Health Facilities in Bangladesh

Dr. Shawrup Golder

Residential Surgeon

Kumuduni Women's Medical College Hospital, Tangail, Bangladesh

ABSTRACT

The rising caesarean birth rates in Bangladesh are a disturbing trend, and it is fueled by intense fear of labour pains, CDMR, previous obstetric experience and ignorance. Approximately 3.1 million annual births occur in Bangladesh. Almost one in three deliveries was performed by C-section. Deliveries performed by C-section increased by more than 10 times between 2001 and 2016. (BDHS-2018). The private sector contributed the largest share of C-sections (83%) than Public sector (31%). (BDHS-2018). Bangladesh is facing a massive boom in the number of medically unnecessary C-sections - between 2016 and 2018 the number of operations increased by 51 per cent, new figures released by Save the Children reveal. However the present study has conducted to assess the factors affecting child birth, to compare the mode of child birth at public & private facilities and to socio-economic factors related to mode of child birth at facilities. A cross-sectional survey was conducted using a structured questionnaire, focusing on influencing factors on mode of child birth at Public and Private Health facilities. Both qualitative and quantitative research methods were followed in this study. This study will be conducted at public and private hospitals. Purposive sampling method was used for the study. Data were collected from Total 10 health facilities, five from public and five from private sector. Total 300 respondents were selected for the study. From private hospital 150 respondents and from public hospital 150 respondents were selected. Respondent group–Doctors, Nurses, FWVs, Midwives. Data were collected from primary and secondary sources. Primary Data were collected from the respondents of the study area. Secondary Data were collected from Books, Research Reports, Journals, Magazines, Annual Reports of Bangladesh Bureau of Statistics (BBS), Annual Reports of Bangladesh Medical Research Council, Websites of Ministry of Health and Family Planning Welfare of Peoples Republic of Bangladesh, Internet etc. Questionnaire was used for data collection. Primary Data were collected by face to face interview with the respondents. Secondary data were collected from reviewing of secondary sources. Mothers who were patients of child delivery and caesarean section due to pregnancy were included in this study. Patients except child delivery and caesarean section due to pregnancy were excluded in the study. Collected data were analyzed by using Computer Program Statistical Package for the Social Sciences (SPSS) version 16. Tables, graphs were made by using SPSS. The results of this study provide a better understanding of the prevalence and the factors influencing the choice of mode of delivery among childbearing women in Bangladesh. While age, level of education, and involvement in a health related profession influenced the decision made by the women in this study, the perceptions of the benefits and severity of the different modes of delivery were the most important considerations. There is also evidence that advice from health professionals plays an important role in the maternal decision on mode of birth. There is a need for comprehensive information on the benefits and severity of the different modes of delivery, instead of just the birth procedures. Women of childbearing age should have a right to receive comprehensive and unbiased information from health professionals so that they can make an informed choice on the mode of birth that is most suitable for them.

Key words: *Child birth, Health Facilities, Caesarean section, vaginal delivery, postpartum haemorrhaging, Antenatal check up, Anemia status, Private Health facilities, Public Health facilities.*

INTRODUCTION

A Caesarean section (CS) can save lives and prevent injuries in circumstances such as dystocia, malpresentation and foetal distress, which occur in approximately 5–15% of pregnancies. An unnecessary CS can cause additional maternal and perinatal morbidity in cases such as postpartum haemorrhaging, reduced fertility and placental complications in subsequent pregnancies for mothers. Additionally, there is an increased risk of postpartum respiratory morbidity, inflammatory bowel disease, obesity and Type-1 diabetes for children. Finally, excessive unnecessary CSs are a substantial economic burden for society. In the past, CS was only implemented in cases of extenuating circumstances or because of identified foetal complications. However, countries worldwide have witnessed an increasing trend toward the use of CS. Studies found a disparity in the contribution of women requesting CS to the escalating CS rate in different countries, from none reported to 17 %. It has been demonstrated that age, fear of vaginal birth (VB), issues of control, and safety of CS are the primary factors associated with women's requests for

CS. Other researchers found that fewer interactions between the mother and practitioners, as well as perceived inequality and inadequacy of care, were also reasons that childbearing women requested CS. However, few studies exist that focus on how social and organizational factors, such as culture, hospital and family, influence women's mode of birth preference, and a limited number of studies has focused on the change of their preference throughout the pregnancy.

When vaginal delivery is not possible, caesarean section (CS) is an alternative mode of giving birth, which ensures the safety of mother and her child. CS delivery is a highly effective procedure with surgical intervention in obstetrical care for preventing birth complications of a mother. CS delivery causes various complications for mother and the birth could be traumatic for the baby with long term consequences. Some previous studies reported that deficiency of family bondage, disharmony and shock were associated with CS delivery [1, 2]. In 1985 WHO suggested that the optimal population range for CS delivery rates would be between 5 and 15% [3, 4], and WHO stated, in 2015 (BMG-2016) that for the crying need of CS delivery to a woman all possible effort should be provided without endeavoring any kind of specific rate [5]. During pregnancy maternal deaths are mainly caused by hemorrhage, unsafe abortion, hypertension, obstructed labour and infections. Though these types of complications are unpredictable, almost all could be prevented by ensuring institutional delivery services as timely management and treatment can make the difference between life and death [6, 7]. Lack of knowledge on CS delivery and misinformation about natural childbirth is important reasons for women to choose delivery by CS [8]. Also fear, anxiety and pain can play an important role for mothers to choose CS delivery [9]. Now a day in Bangladesh without any complications some women undergo CS delivery.

OBJECTIVES OF THE STUDY
The Objectives of the study are as follows:
1.   To assess the factors affecting child birth.
2.   To compare the mode of child birth at public & private facilities.
3.   To socio-economic factors related to mode of child birth at facilities.

METHODOLOGY OF THE STUDY

Study design: A cross-sectional survey was conducted using a structured questionnaire, focusing on influencing factors on mode of child birth at Public and Private Health facilities.

Study area: Both qualitative and quantitative research methods were followed in this study. This study will be conducted at public and private hospitals.

Sampling method: Purposive sampling method was used for the study.

Sample size: Data were collected from Total 10 health facilities, five from public and five from private sector. Total 300 respondents were selected for the study. From private hospital 150 respondents and from public hospital 150 respondents were selected. Respondent group – Doctors, Nurses, FWVs, Midwives.

Sources of Data: Data were collected from primary and secondary sources.

Sources of Primary Data: Primary Data were collected from the respondents of the study area.

Sources of Secondary Data: Secondary Data were collected from Books, Research Reports, Journals, Magazines, Annual Reports of Bangladesh Bureau of Statistics (BBS), Annual Reports of Bangladesh Medical Research Council, Websites of Ministry of Health and Family Planning Welfare of Peoples Republic of Bangladesh, Internet etc.

Tools for Data Collection: Questionnaire was used for data collection.

Method of Data Collection: Primary Data were collected by face to face interview with the respondents. Secondary data were collected from reviewing of secondary sources.

Inclusion Criteria: Mothers who were patients of child delivery and caesarean section due to pregnancy were included in this study.

Exclusion Criteria: Patients except child delivery and caesarean section due to pregnancy were excluded in the study.

Analysis of Data: Collected data were analyzed by using Computer Program Statistical Package for the Social Sciences (SPSS) version 16. Tables, graphs were made by using SPSS.

RESULTS AND DISCUSSION

Table 1: Age of the Respondents

Age group (in Years)	Frequency	Percent	Cumulative Percent
18-22 Years	156	39.0	39.0
23-27 Years	82	20.5	59.5
28-32 Years	100	25.0	84.5
33-37 Years	54	13.5	98.0
38 Years & above	8	2.0	100.0
Total	400	100.0	

Figure 1: Age of the Respondents

Age of the Respondents has shown in the above table and graph. From the result it was found that 39.0% Respondents were age group 18-22 years which was maximum but 2% Respondents were age group 38 years and above.

Table 2: Profession of the Respondents

Profession	Frequency	Percent	Cumulative Percent
Housewife	298	74.5	74.5
Service	102	25.5	100.0
Total	400	100.0	

Professions of the Respondents have shown in the above table and graph. From the result it was found that
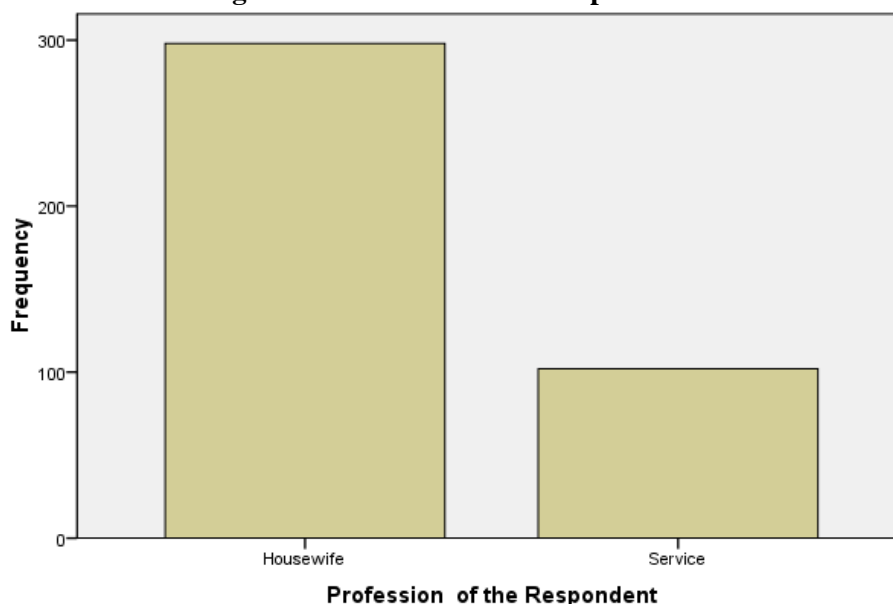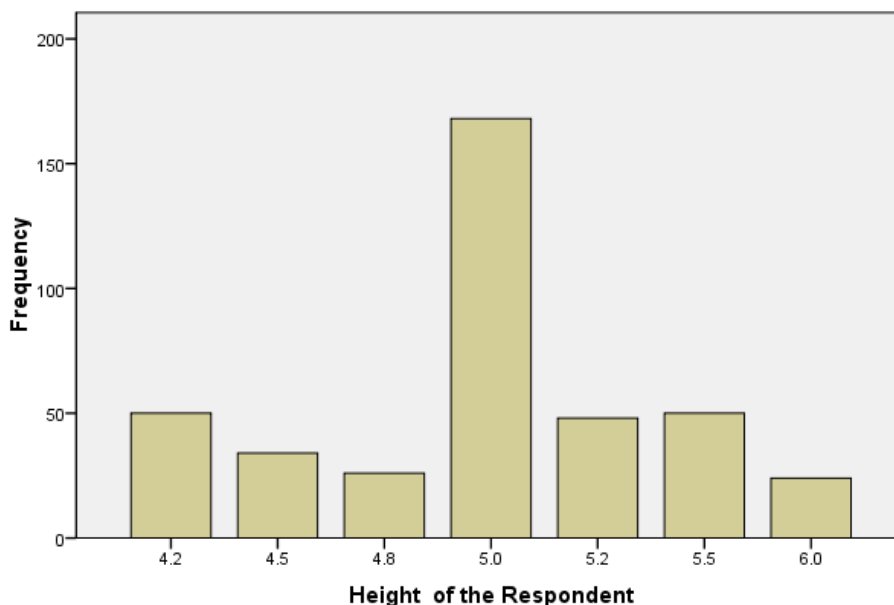
Figure 2: Profession of the Respondents

Table 3: Height of the Respondents

Height (in Feet)	Frequency	Percent	Cumulative Percent
4.2	50	12.5	12.5
4.5	34	8.5	21.0
4.8	26	6.5	27.5
5	168	42.0	69.5
5.2	48	12.0	81.5
5.5	50	12.5	94.0
6	24	6.0	100.0
Total	400	100.0	

Figure 3: Height of the Respondents

Heights of the Respondents have shown in the above table and graph. From the result it was found that 42.0% respondents had 5 feet height which were maximum but 6.0% respondents had 6 feet height which were minimum.

Table 4: Weight of the Respondents

| Weight (in Kg)	Frequency	Percent	Cumulative Percent
45	104	26.0	26.0
55	106	26.5	52.5
60	116	29.0	81.5
70	58	14.5	96.0
80	16	4.0	100.0
Total	400	100.0	

Figure 4: Weight of the Respondents
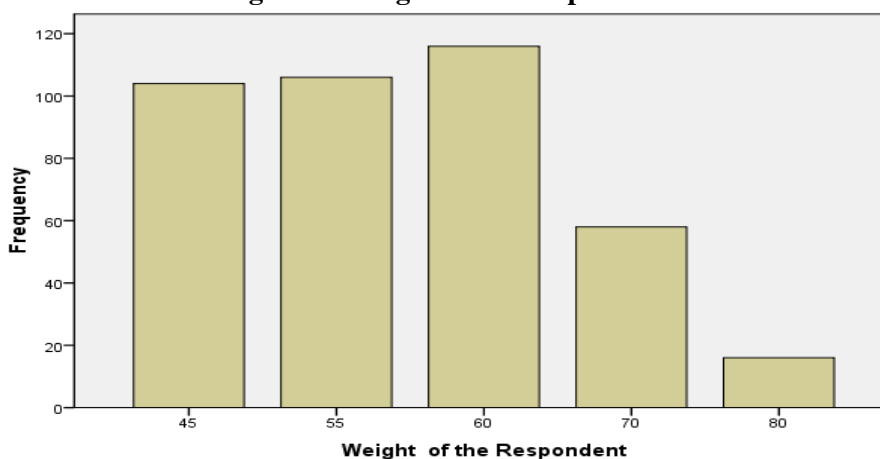
Weights of the Respondents have shown in the above table and graph. From the result it was found that 29.0 respondents had 60 Kg weight which was maximum but 4% respondents had 80 Kg weight which was minimum.

Table 5: Educational qualification of the Respondents

Educational qualification	Frequency	Percent	Cumulative Percent
Below SSC	150	37.5	37.5
Class 9	82	20.5	58.0
Graduate	54	13.5	71.5
HSC	48	12.0	83.5
SSC	66	16.5	100.0
Total	400	100.0	

**Figure 5: Educational qualification of the Respondents**
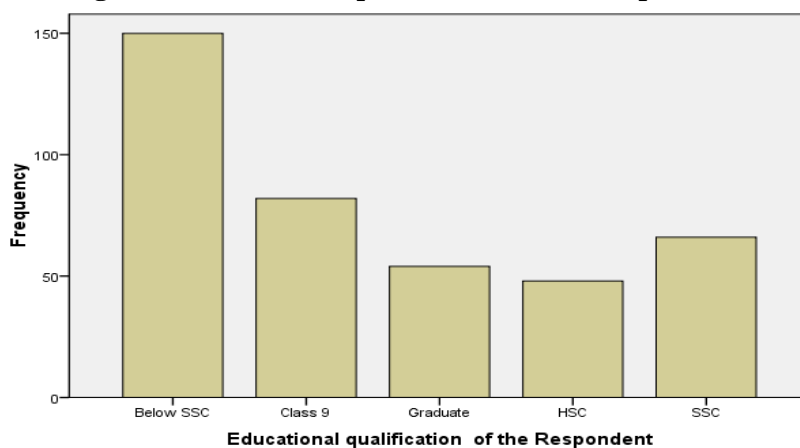
Educational qualifications of the Respondents have shown in the above table and graph. From the result it was found that 37.5% respondents educational qualification were below SSC which was aximum but only 13.5% respondents were graduate which were minimum.

Table 6: Age variation of caesarian section

Age group (in Years)	Caesarian (Percent)
18-22 Years	70%
23-27 Years	30%
28-32 Years	25%
33-37 Years	20%
38 Years & above	80%

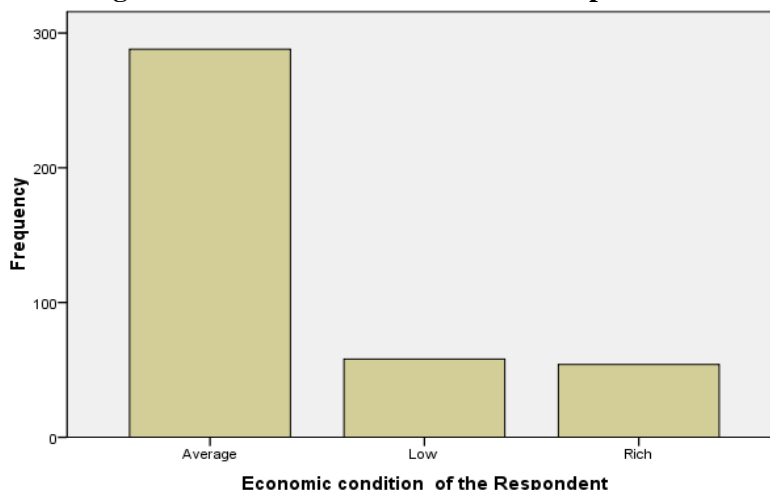**Figure 6: Age variation of caesarian section**
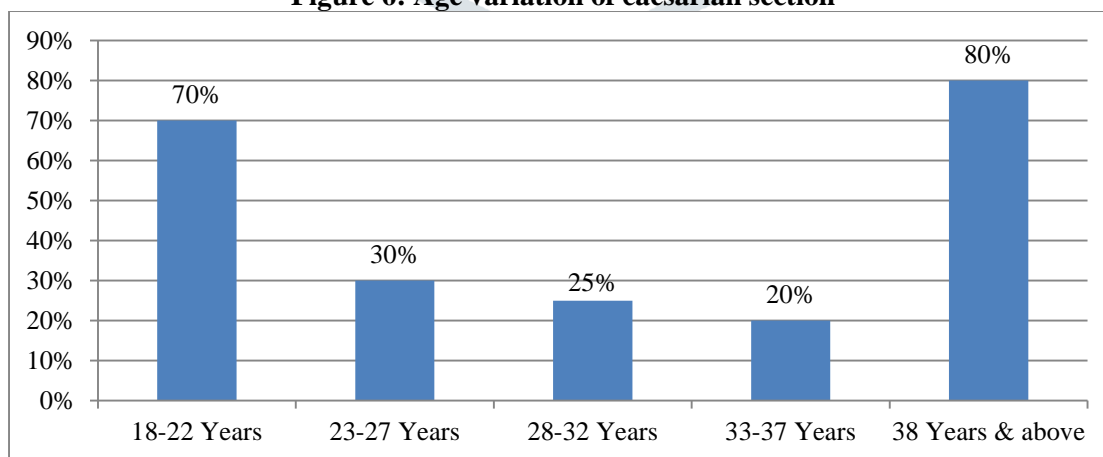
Age variation of caesarian section has shown in the above table and graph. From the result it was found that caesarian section is more in old age and young age. 80% caesarian section occur in age group 38 years and above which was maximum but 20% caesarian section occur in age group 33-37 years which was minimum. On the other hand 70% caesarian section occurs in age group 18-22 years and 30% caesarian section occur in age group 23-27 years.

Table 7: Economic condition of the Respondents

|	Frequency	Percent	Cumulative Percent
Average	288	72.0	72.0
Poor	58	14.5	86.5
Rich	54	13.5	100.0
Total	400	100.0	

Figure 7: Economic condition of the Respondents

Economic conditions of the Respondents have shown in the above table and graph. From the result it was found that 72% respondents economic condition was average which was maximum but only 13.5% respondents were rich which was minimum.

Table 8: Educational variation of caesarian section

Educational qualification	Caesarian section Percent
Below SSC	16.3%
Graduate	83.7%
Total	100.0

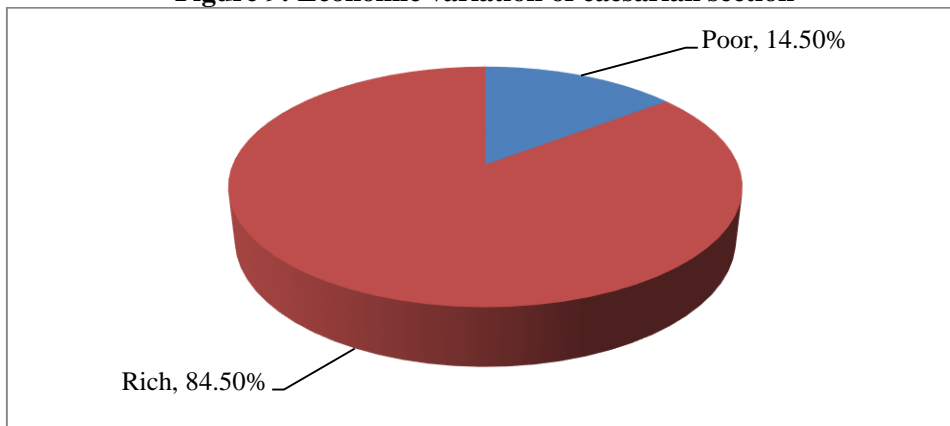**Figure 8: Educational variation of caesarian section**
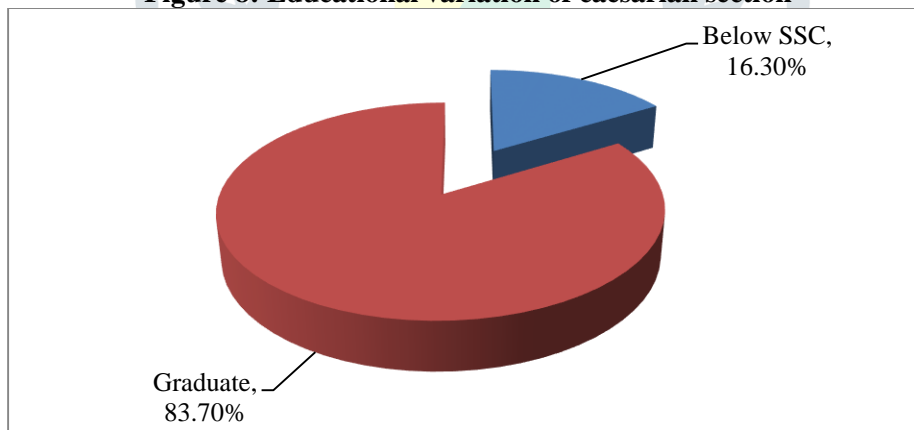
Educational variation of caesarian section has shown in the above table and graph. From the result it was found that more caesarian section occur in educated women but less caesarian section occur in less educated women. The result shows that 83.70% graduate women done caesarian section but 16.30% below SSC passed women done caesarian section.

Table 9: Economic variation of caesarian section

Economic condition	Percent
Poor	14.5
Rich	84.5
Total	100.0

**Figure 9: Economic variation of caesarian section**

Economic variation of caesarian section has shown in the above table and graph. From the result it was found that more caesarian section occur in rich women but less caesarian section occur in poor women. The result shows that 84.50% rich women done caesarian section but 14.50% poor women done caesarian section.

Table 10: Anemia status of the Respondents

	Frequency	Percent	Cumulative Percent
Negative	350	87.5	87.5
Positive	50	12.5	100.0
Total	400	100.0	

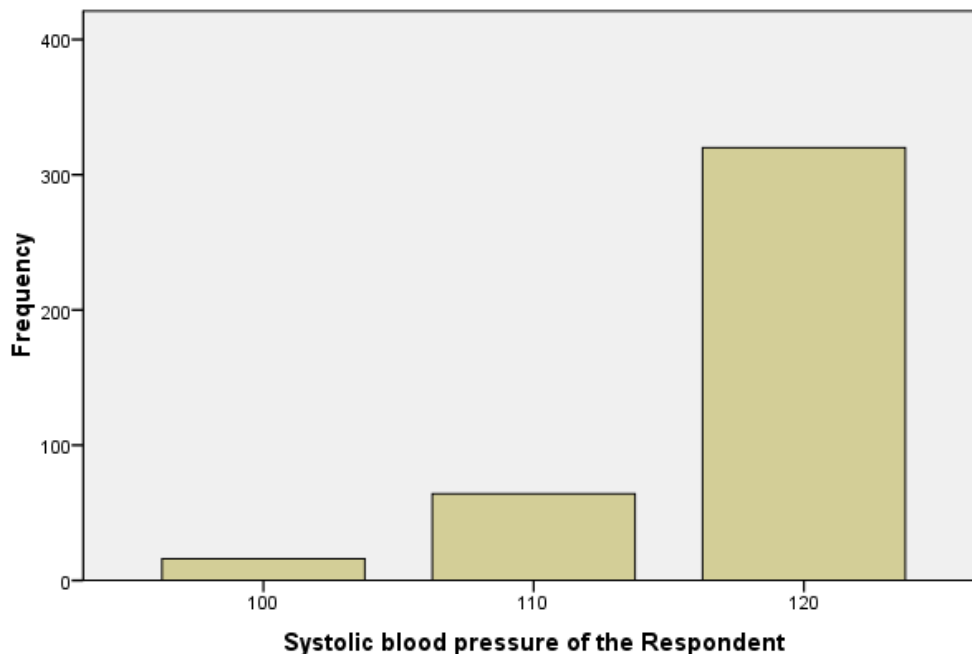**Figure 10: Anemia status of the Respondents**
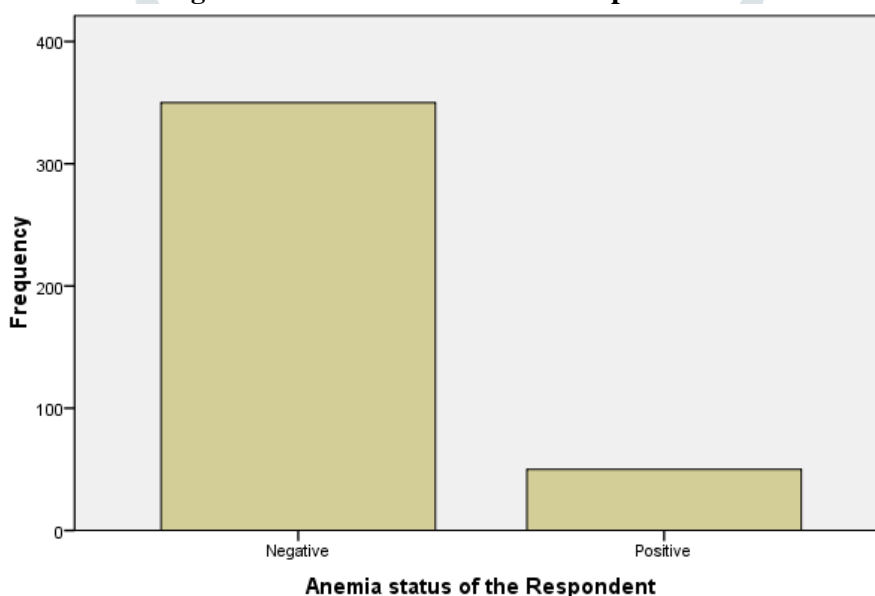
Anemia statuses of the Respondents have shown in the above table and graph. From the result it was found that 87.5% respondents were anemia negative but 12.5% respondents were anemia positive.

Table 11: Systolic blood pressure of the Respondents

Systolic blood pressure	Frequency	Percent	Cumulative Percent
100	16	4.0	4.0
110	64	16.0	20.0
120	320	80.0	100.0
Total	400	100.0	

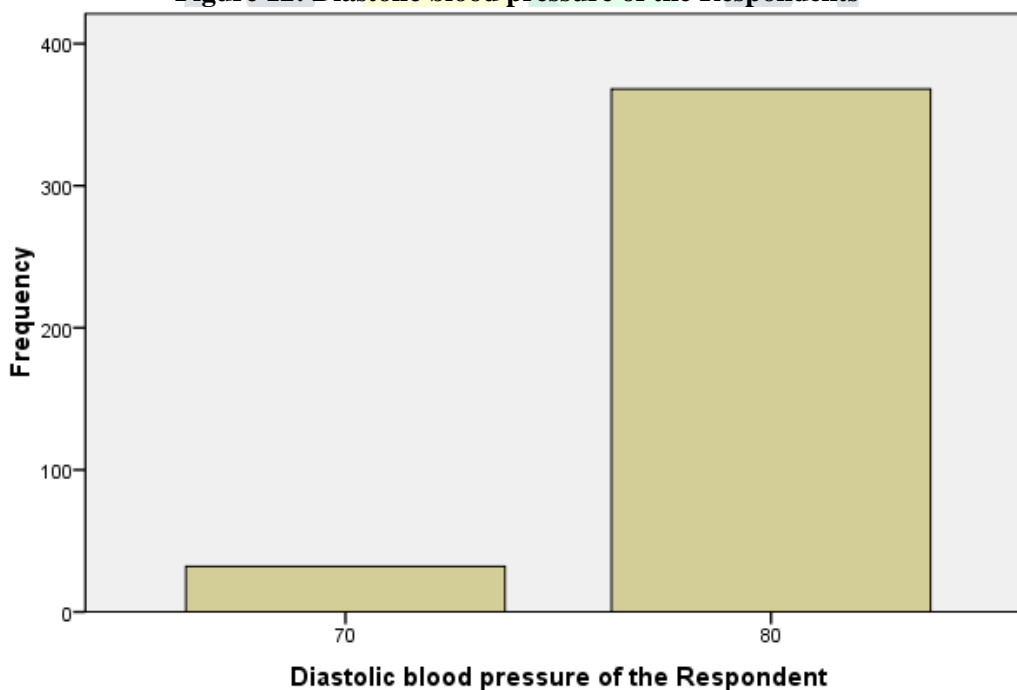**Figure 11: Systolic blood pressure of the Respondents**

Systolic blood pressures of the Respondents have shown in the above table and graph. From the result it was found that 80% respondents systolic blood pressure were 120 which was maximum but only 4% respondents systolic blood pressure were 100 which was minimum.

Table 12: Diastolic blood pressure of the Respondents

Diastolic blood pressure	Frequency	Percent	Cumulative Percent
70	32	8.0	8.0
80	368	92.0	100.0
Total	400	100.0	

Figure 12: Diastolic blood pressure of the Respondents

Diastolic blood pressures of the Respondents have shown in the above table and graph. From the result it was found that 92% respondents diastolic blood pressure were 80 but 8% respondent's diastolic blood pressure were 70.

Table 13: Edema status of the Respondents

	Frequency	Percent	Cumulative Percent
No	400	100.0	100.0

Edema statuses of the Respondents have shown in the above table and graph. From the result it was found that no respondents had edema.
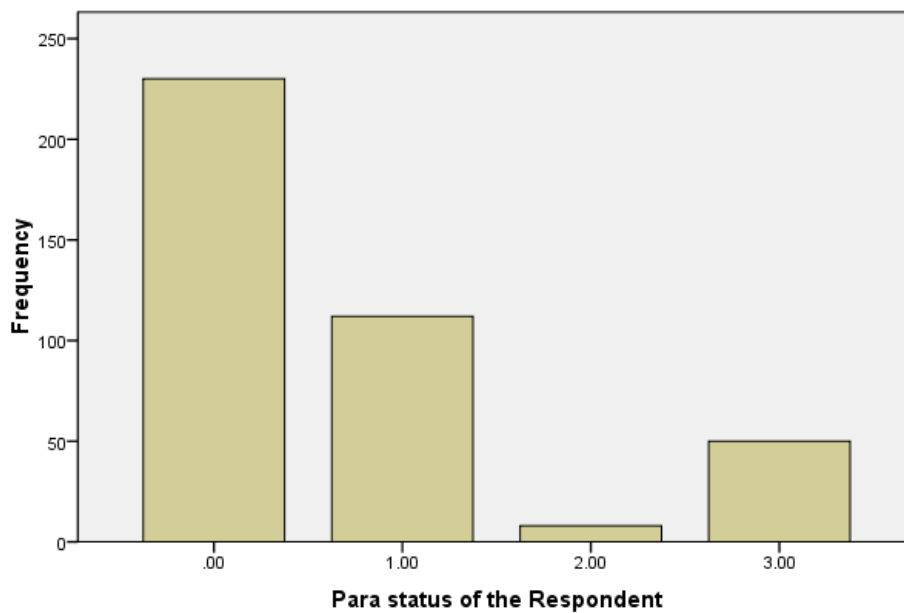
Table 14: Preaclamsia status of the Respondents

	Frequency	Percent	Cumulative Percent
No	400	100.0	100.0

Preaclamsia statuses of the Respondents have shown in the above table and graph. From the result it was found that no respondents had preaclamsia.

Table 15: Para status of the Respondents

| Para status	Frequency	Percent	Cumulative Percent
0	230	57.5	57.5
1	112	28.0	85.5
2	8	2.0	87.5
3	50	12.5	100.0
Total	400	100.0	

Figure 14: Para status of the Respondents

Para statuses of the Respondents have shown in the above table and graph. From the result it was found that 57.5% respondents had 0 prara status which was maximum but 2% respondents had 2 para status which was minimum.

Table 16: Gravida status of the Respondents

Gravida status	Frequency	Percent	Cumulative Percent
First	230	57.5	57.5
Fourth	50	12.5	70.0
Second	120	30.0	100.0
Total	400	100.0	

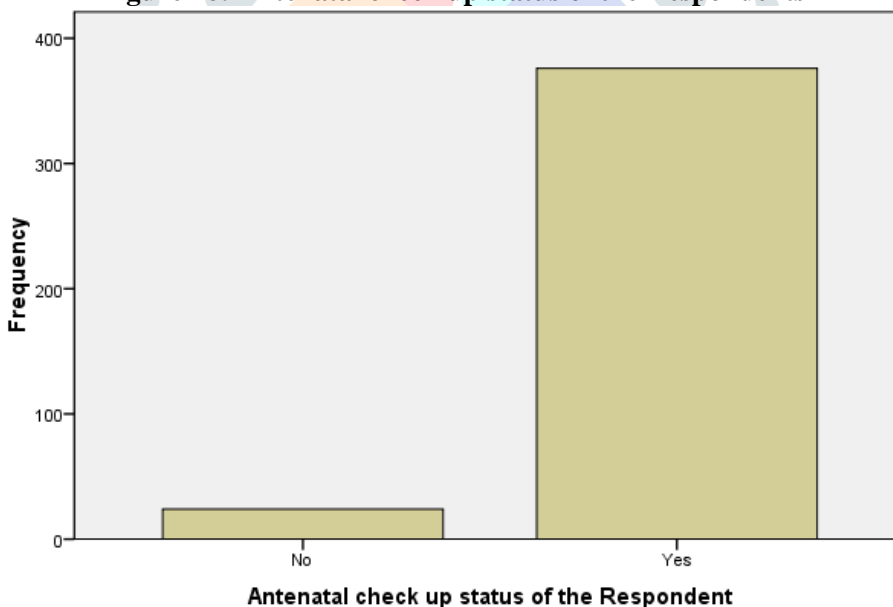**Figure 15: Gravida status of the Respondents**
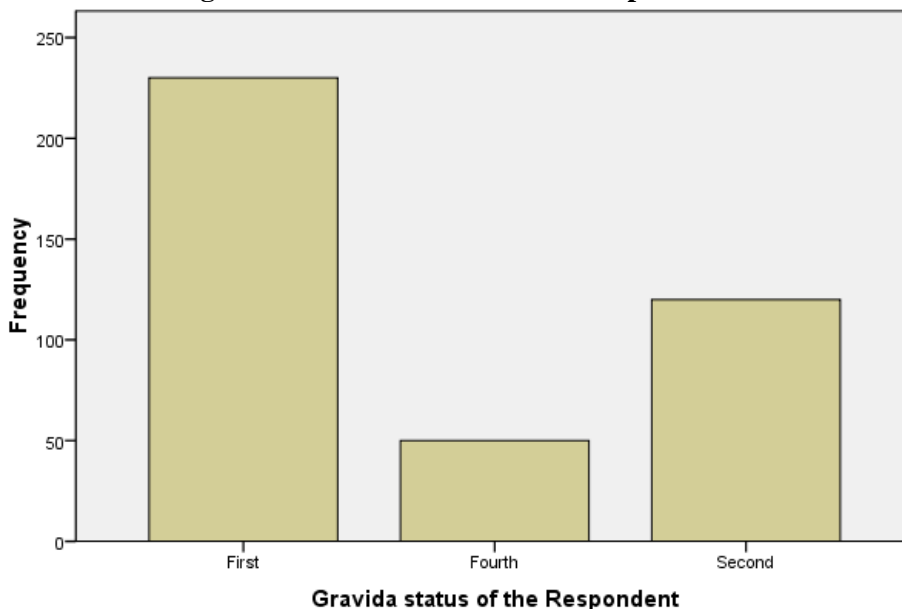
Gravida statuses of the Respondents have shown in the above table and graph. From the result it was found that 57.5% respondents had first gravid which was maximum but 12.5% respondents had fourth gravid which was minimum.

Table 17: Antenatal check up status of the Respondents

Respondents opinion	Frequency	Percent	Cumulative Percent
No	24	6.0	6.0
Yes	376	94.0	100.0
Total	400	100.0	

Figure 16: Antenatal check up status of the Respondents

Antenatal checks up status of the Respondents have shown in the above table and graph. From the result it was found that 94% respondents do antenatal check up regularly but 6% respondents don't check up antenatal check up regularly.

Table 18: Partograph status of the Respondents

	Frequency	Percent	Cumulative Percent
No	400	100.0	100.0

Partograph statuses of the Respondents have shown in the above table and graph. From the result it was found that all the respondents had no knowledge about partograph.

Table 19: Indication of cesarean section of the Respondents

	Frequency	Percent	Cumulative Percent
Yes	400	100.0	100.0

Indications of cesarean section of the Respondents have shown in the above table and graph. From the result it was found that all the respondents opined about indication of cesarean section.

Table 20: Previous cesarean section history of the Respondents

	Frequency	Percent	Cumulative Percent
No	288	72.0	72.0
Yes	112	28.0	100.0
Total	400	100.0	

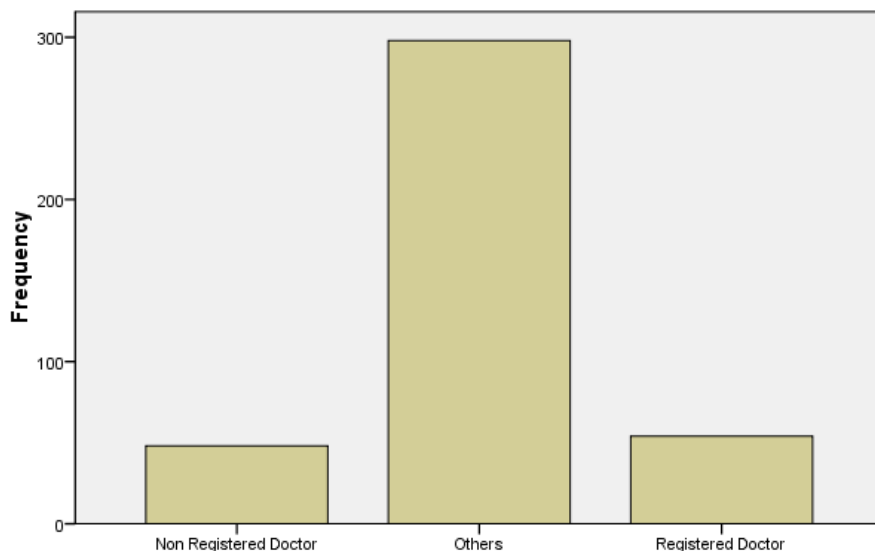**Figure 18: Previous cesarean section history of the Respondents**

Previous cesarean section history of the Respondent

Previous cesarean section histories of the Respondents have shown in the above table and graph. From the result it was found that 72% respondents had no previous cesarean section history and 28% respondents had previous cesarean section history.

Table 21: Respondents refer by

	Frequency	Percent	Cumulative Percent
Non Registered Doctor	48	12.0	12.0
Others	298	74.5	86.5
Registered Doctor	54	13.5	100.0
Total	400	100.0	

Figure 19: Respondents refer by
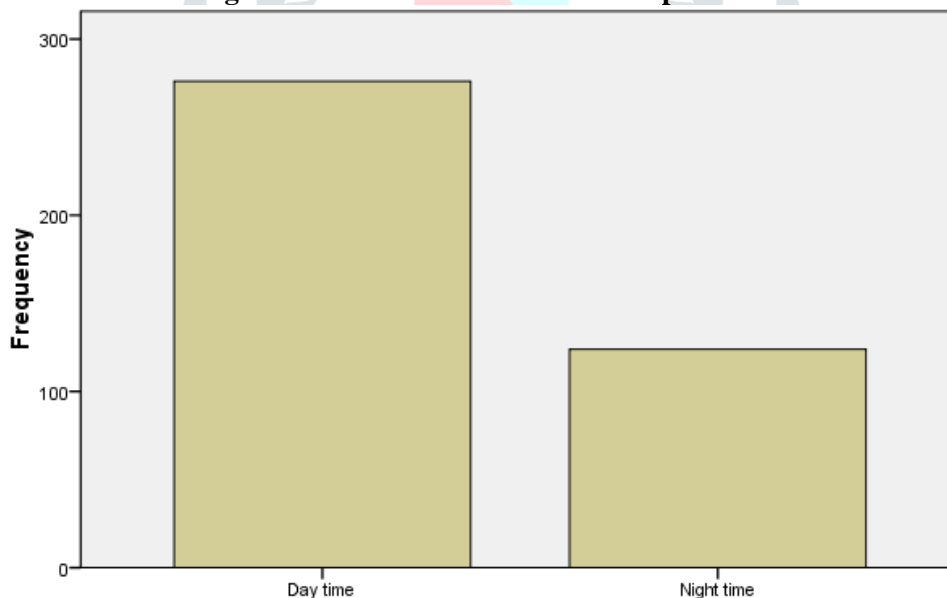

References of the Respondents have shown in the above table and graph. From the result it was found that 74.5% respondents went to Doctor by hearing others which was maximum but 12% respondents went to Doctor by hearing from non registered doctors which were minimum.

Table 22: Admission time of the Respondents

	Frequency	Percent	Cumulative Percent
Day time	276	69.0	69.0
Night time	124	31.0	100.0
Total	400	100.0	

Figure 20: Admission time of the Respondents

Admission times of the Respondents have shown in the above table and graph. From the result it was found that 69% respondents get admission during day time but 31% respondents get admission during night time.

Table 23: Delivery time of the Respondents

|	Frequency	Percent	Cumulative Percent
Day time	174	43.5	43.5
Night time	226	56.5	100.0
Total	400	100.0	

Figure 21: Delivery time of the Respondents

Delivery times of the Respondents have shown in the above table and graph. From the result it was found that 56.5% respondents delivered their babies at night time but 43.5% respondents delivered their babies at day time.

Table 24: Total cost of the cesarean section

Cost (in Taka)	Frequency	Percent	Cumulative Percent
5000	56	14.0	14.0
6000	50	12.5	26.5
10000	128	32.0	58.5
12000	50	12.5	71.0
15000	50	12.5	83.5
18000	50	12.5	96.0
20000	16	4.0	100.0
Total	400	100.0	

Figure 22: Total cost of the cesarean section
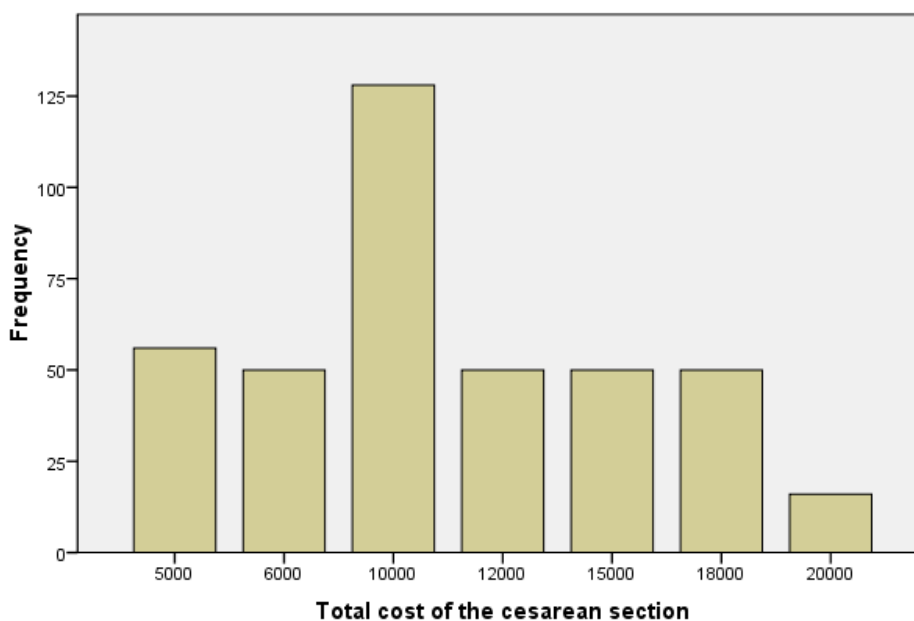
Total costs of the cesarean section of the Respondents have shown in the above table and graph. From the result it was found that 32% respondents expend 10000 taka for cesarean section which was maximum but only 4% respondents spent 20000 taka for cesarean section which was minimum.

CONCLUSIONS

The rising caesarean birth rates in Bangladesh are a disturbing trend, and it is fueled by intense fear of labour pains, CDMR, previous obstetric experience and ignorance. The results of this study provide a better understanding of the prevalence and the factors influencing the choice of mode of delivery among childbearing women in Bangladesh. Although more women in this study preferred caesarean delivery. While age, level of education, and involvement in a health related profession influenced the decision made by the women in this study, the perceptions of the benefits and severity of the different modes of delivery were the most important considerations. There is also evidence that advice from health professionals plays an important role in the maternal decision on mode of birth. There is a need for comprehensive information on the benefits and severity of the different modes of delivery, instead of just the birth procedures. Women of childbearing age should have a right to receive comprehensive and unbiased information from health professionals so that they can make an informed choice on the mode of birth that is most suitable for them.

REFERENCES

1.   Lunze K, Bloom DE, Jamison DT, Hamer DH (January 2013). "The global burden of neonatal hypothermia: systematic review of a major challenge for newborn survival". BMC Medicine. 11 (1): 24. doi:10.1186/1741-7015-11-24. PMC 3606398. PMID 23369256.

2.   Martin RJ, Fanaroff AA, Walsh MC (2014). Fanaroff and Martin's Neonatal-Perinatal Medicine: Diseases of the Fetus and Infant. Elsevier Health Sciences. p. 116. ISBN 978-0-323-29537-6. Archived from the original on 11 September 2017.

3.   Education material for teachers of midwifery: midwifery education modules (PDF) (2nd ed.). Geneva [Switzerland]: World Health Organisation. 2008. p. 3. ISBN 978-92-4-154666-9. Archived (PDF) from the original on 21 February 2015.

4.   Memon HU, Handa VL (May 2013). "Vaginal childbirth and pelvic floor disorders". Women's Health. 9 (3): 265–77, quiz 27677.

5.   Martin E (2015). Concise Colour Medical l.p. Dictionary. Oxford University Press. p. 375. ISBN 978-0-19-968799-2. Archived from the original on 11 September 2017.

6.   Buck GM, Platt RW (2011). Reproductive and perinatal epidemiology. Oxford: Oxford University Press. p. 163. ISBN 978-0-19-985774-6. Archived from the original on 11 September 2017.

7.   Co-Operation, Organization for Economic; Development (2009). Doing better for children. Paris: OECD. p. 105. ISBN: 978-92-64-05934-4. Archived from the original on 11 September 2017.

8.   Olsen O, Clausen JA (September 2012). "Planned hospital birth versus planned home birth". The Cochrane Database of Systematic Reviews (9)

9.   Fossard Ed, Bailey M (2016). Communication for Behavior Change: Volume lll: Using Entertainment–Education for Distance Education. Sage Publications India. ISBN 978-93-5150-758-1. Archived from the original on 11 September 2017. Retrieved 31 July 2016.

10.   "Birth". The Columbia Electronic Encyclopedia (6 ed.). Columbia University Press. 2016. Archived from the original on 6 March 2016. Retrieved 30 July 2016 – via Encyclopedia.com.

11.   "Pregnancy Labor and Birth". Women's Health. 27 September 2010. Archived from the original on 28 July 2016. Retrieved 31 July 2016.

12.   McDonald SJ, Middleton P, Dowswell T, Morris PS (July 2013). "Effect of timing of umbilical cord clamping of term infants on maternal and neonatal outcomes". The Cochrane Database of Systematic Reviews. 7 (7): CD004074. doi:10.1002/14651858.CD004074.pub3. PMC 6544813. PMID 23843134.

13.   Phillips, Raylene. "Uninterrupted Skin-to-Skin Contact Immediately After Birth". Medscape. Archived from the original on 3 April 2015. Retrieved 21 December 2014.

14.   "Essential Antenatal, Perinatal and Postpartum Care" (PDF). Promoting Effective Perinatal Care. WHO. Archived (PDF) from the original on 24 September 2015. Retrieved 21 December 2014.

15.   "Care of healthy women and their babies during childbirth". National Collaborating Centre for Women's and Children's Health. National Institute for Health and Care Excellence. December 2014. Archived from the original on 12 February 2015. Retrieved 21 December 2014.

16.   Hofmeyr GJ, Hannah M, Lawrie TA (July 2015). "Planned caesarean section for term breech delivery". The Cochrane Database of Systematic Reviews (7): CD000166. doi:10.1002/14651858. CD000166. pub2. PMC 6505736. PMID 26196961.

17.   "Childbirth and beyond". womenshealth.gov. 13 December 2016. Retrieved 20 November 2018.

18.   Childbirth: Labour, Delivery and Immediate Postpartum Care. World Health Organization. 2015. p. Chapter D. ISBN 978-92-4-154935-6. Archived from the original on 11 September 2017. Retrieved 31 July 2016.

19.   Molina G, Weiser TG, Lipsitz SR, Esquivel MM, Uribe-Leitz T, Azad T, Shah N, Semrau K, Berry WR, Gawande AA, Haynes AB (December 2015). "Relationship between Cesarean Delivery Rate and Maternal and Neonatal Mortality". JAMA. 314 (21): 2263–70.

20.   World Health Organization. "Newborns: reducing mortality". World Health Organization. Archived from the original on 3 April 2017. Retrieved 1 February 2017.

21.   Weber SE (January 1996). "Cultural aspects of pain in childbearing women". Journal of Obstetric, Gynecologic, and Neonatal Nursing. 25 (1): 67–72.

22.   Callister LC, Khalaf I, Semenic S, Kartchner R, et al. (December 2003). "The pain of childbirth: perceptions of culturally diverse women". Pain Management Nursing. 4 (4): 145–54.

23.   Hodnett ED (May 2002). "Pain and women's satisfaction with the experience of childbirth: a systematic review". American Journal of Obstetrics and Gynecology. 186 (5 Suppl Nature): S160-72.

24.   Harms, Rogert W. Does back labor really happen? Archived 4 February 2016 at the Wayback Machine, mayoclinic.com, Retrieved 8 September 2014

25.   Meyer D (2007). "Selective serotonin reuptake inhibitors and their effects on relationship satisfaction". The Family Journal. 15 (4): 392–97.

26.   Bowen R (12 July 2010). "Oxytocin". Hypertexts for Biomedical Sciences. Archived from the original on 29 August 2014. Retrieved 18 August 2013.

27.   Zlotnick C, Johnson SL, Miller IW, Pearlstein T, et al. (April 2001). "Postpartum depression in women receiving public assistance: pilot study of an interpersonal-therapy-oriented group intervention". The American Journal of Psychiatry. 158 (4): 638–40.

28.   Chabrol H, Teissedre F, Saint-Jean M, Teisseyre N, Sistac C, Michaud C, Roge B (2002). "[Detection, prevention and treatment of postpartum depression: a controlled study of 859 patients]". L'Encephale. 28 (1): 65–70. PMID 11963345.

29.   Pillitteri A (2010). "Chapter 15: Nursing Care of a Family during Labor and Birth". Maternal & Child Health Nursing: Care of the Childbearing & Childrearing Family. Hagerstown, Maryland: Lippincott Williams & Wilkins. p. 350. ISBN 978-1-58255-999-5. Archived from the original on 28 June 2014. Retrieved 18 August 2013.

30.   Levine D (15 March 2012). "Types of Forceps Used in Delivery". Healthline. Healthline Networks. Retrieved 10 August 2013.

31.   Goldberg AE (2 March 2018). "Cervical Ripening". Medscape. Retrieved 10 May 2018.

32.   Kuperminc M, Lessing JB, Yaron Y, Peyser MR (December 1993). "Nifedipine versus ritodrine for suppression of preterm labour". British Journal of Obstetrics and Gynaecology. 100 (12): 1090–94.

33.   Jokic M, Guillois B, Cauquelin B, Giroux JD, Bessis JL, Morello R, Levy G, Ballet JJ (March 2000). "Fetal distress increases interleukin-6 and interleukin-8 and decreases tumour necrosis factor-alpha cord blood levels in noninfected full-term neonates". BJOG. 107 (3): 420–25.

34.   Lyrenäs S, Clason I, Ulmsten U (February 2001). "In vivo controlled release of PGE2 from a vaginal insert (0.8 mm, 10 mg) during induction of labour". BJOG. 108 (2): 169–78.

35.   Novak S. "The Most Popular Time for Babies to Be Born". Washington Post. Archived from the original on 16 June 2018. Retrieved 9 May 2018.

36.   Reiter RJ, Tan DX, Korkmaz A, Rosales-Corral SA (2013). "Melatonin and stable circadian rhythms optimize maternal, placental and fetal physiology". Human Reproduction Update. 20 (2): 293–307.