DOI: 10.52131/rahr.2023.v1i1.2173

Review of Applied Health Research

Volume 01, Number 01, 2024, Pages 28–37
Journal Homepage:
https://journals.internationalrasd.org/index.php/rahr

Cesarean Section Delivery in the Districts of Pakistan: Prevalence, Extent and Correlates

Hira Javed [1], Dr. Tusawar Iftikhar Ahmad[2], Dr. Baseerat Adnan[3]

[1] M.Phil. Economics, The Islamia University of Bahawalpur, Pakistan, Email: hirabukhari004@gmail.com
[2] Associate Professor, Department of Economics, The Islamia University of Bahawalpur, Pakistan. Email: tusawar.iftikhar@iub.edu.pk
[3] PGR FCPS, Department of Obstetricians and Gynaecologists, Doctor's hospital and medical Centre Lahore Email: baseeratadnan@gmail.com

ARTICLE INFO

Article History:
Received: September 16, 2023
Revised: December 28, 2023
Accepted: December 29, 2023
Available Online: December 31, 2023

Keywords:
Married Women
Cesarean Section Delivery
Pakistan Demographic and Household Survey

Funding:
This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

C-section delivery is a life-saving surgical method to deliver one or more babies. It plays an important role to reduce maternal mortality and considers a safe procedure over the past few decades. According to WHO, C-section rate at 5-15% provides the best outcomes for mother and baby but there is no justification for higher than this rate. The worldwide rate of caesarean section increases and observes 21.1% in 2015, also increasing in Pakistan from 14% in 2013 to 22% in 2017-18. The objective of this study is to examine the prevalence, extent and correlates of caesarean section delivery in Pakistan as well as across the districts of Pakistan. The study covers Sample of 12000 ever-married women based on the Pakistan Demographic and Household survey (PDHS) 2017-18. There are some previous studies, for utilization of caesarean section delivery, have found that the increasing the trend of caesarean section delivery was an outcome of socioeconomic characteristics (respondent education, wealth status, gender of household head, women occupation), demographic (respondent age, total number of children ever born, gender of baby) and geographical factors (region, place of residence). Study concluded that among 143 districts of Pakistan, there are 69 districts where CS rate is above 15% and in 31 districts CS rate is below 5%. Only 43 districts have CS delivery rates in normal range of 5-15%.

Corresponding Author's Email: baseeratadnan@gmail.com

1. Introduction

The Sustainable Development Goals relating to maternal health are with an objective of decreasing maternal mortality rate (MMR) below the 70 percent of 100,000 live births globally and to make sure healthy life and encourage well-being for all at all ages by 2030 (Nations, 2015). Pakistan is the fifth biggest contributor of parental mortality rate at global level which is 6 percent of the world. In Pakistan out of 100,000 live births maternal mortality rate is 276 deaths. The main reason of maternal and neonatal baby mortality and injury are complications during pregnancy. Maternal mortality is reduced by providing access to medical facility during delivery period in High-income countries (Abbas, Amir ud Din, & Sadiq, 2018).

C-section delivery play important role to reduce maternal mortality and consider safe procedure over the past few decades. The caesarean section is an important surgical procedure

to deliver one or more than one child. It is used when normal delivery would put the mother and child life in risks or an abnormal position of baby. It is the method to safe both mother and newborn baby and it is mostly performed when normal delivery is not possible. Cesarean section is a regular and older operating procedure in obstetrics by which the baby is delivered through an incision in the belly and uterus (Buowari, 2012; Joseph, Ann, Loise, Marion, & Rosemary, 1988; Manyeh, Amu, Akpakli, Williams, & Gyapong, 2018).

The worldwide rate of caesarean section delivery is increasing rapidly as well as reaches 21.1 percent of all childbirths in 2015 with yearly increasing rate of 3.7 percent during 2000-2015 (Karim et al., 2020). During last few decades the 52 countries have less than 10% cesarean section rates, 14 countries have CS rates from 10-15% and 69 countries have cesarean section rates more than 15%. So, world health organization recommended in 1985 that CS rate of any country should not be exceeded 10-15% (Gibbons et al., 2010; Organization, 1985). In some South Asian countries, cesarean section rate rapidly increased include Pakistan from 14% in 2012-13 to 22% in 2017-18 (Nazir & Cready, 2020), C-section rate increase and observed 33% at population level in last two decades in the Bangladesh (Karim et al., 2020), 17% in the India (Bhatia, Banerjee, Dixit, & Dwivedi, 2020), 1% in Afghanistan (Y.-M. Kim et al., 2012), 18.7% in Bhutan (Dorji et al., 2021) and 5% in Nepal (Samdal et al., 2016).

In developed countries cesarean section rate also increasing like in U.S.A 30.3%, U.K 22%, Canada 26%, France 19%, Australia 30% which is not justifiable according to WHO. The recent data from 150 countries observed, all birth through CS was 18.6%, ranging from 1.4 to 56.4%. Brazil country has highest CS rate 55.6%, Dominion Republic 56.4%, Latin America, Egypt 51.8 %, Iran and Turkey in Asia 47.9%, 47.5% accordingly and in New Zealand 32.8%. In developing countries, recommendations of doctors to perform Cesarean section seems more important more decisive than a woman's preference. While doctors give preference to cesarean section delivery for the motive of financial incentive and time-saving (Amjad et al., 2018). The mothers who are giving birth through cesarean section delivery having poorer health as compared to the health status of women who giving birth through normal delivery (Gerard Jansen et al., 2007).

In many cases, cesarean section is not performed due to medical reasons but also other factors affected such as fear of normal delivery pain, previous normal delivery birth complications, last baby born through cesarean section, insufficient awareness about normal delivery and lack of relief methods are important determinants for cesarean choice (Miri Farahani & Abbasi Shavazi, 2012; Movahed, Enayat, Ghaffarinasab, Alborzi, & Mozafari, 2012). The cesarean section delivery has some complications for both mother and newborn, For Mothers outcomes after C-section such as bleeding, wound infection, postpartum hemorrhage, infection and endometritis (Allen, O'Connell, Liston, & Baskett, 2003; Häger et al., 2004; Hebert et al., 1999; Murphy, Stirrat, & Heron, 2002; Owen & Andrews, 1994; Schuitemaker et al., 1997). Some of outcomes for newborn such as respiratory infection, low APGAR score, birth before time from an incorrect gestational age and fetus injury. Any operation on uterus can affect next pregnancies and deliveries.

C-section is linked with short term and long-term risks. Short term complications of mother's current cesarean section delivery such as CS increase the probability of requiring blood transfusion (process of transferring blood from healthy person to patient), complications of anesthesia (the injection of drugs before surgical operations to avoid pain), organ injury (heart, kidney, lungs, liver affected etc.), thromboembolic disease and in newborn respiratory distress (child face trouble in breathing) (Keag, Norman, & Stock, 2018; NIH & NIH, 2006).

The long-term complications of CS are such as increase chances of asthma problem (It is a long-term disease of the lungs. It causes your airways to get inflamed and narrow, and it makes it hard to breathe) and obesity (accumulation of excessive fat that present risk to health) in child also subsequent later pregnancies complications, uterine rupture (It is a rare, but serious childbirth complication that can occur during vaginal birth), placenta Previa (when a pregnant woman's placenta blocks the opening to the cervix that allows the baby to be born. It can cause severe bleeding during pregnancy and delivery) (Cook, Jarvis, Knight, & Dhanjal, 2013; Keag et al., 2018; Marshall, Fu, & Guise, 2011; Timor-Tristch & Monteagudo, 2013).

Many studies have been investigated the prevalence and determinants of cesarean section delivery but district wise prevalence of C-section delivery are unexplored. Hence, the study has two objectives: (1) to examine the Prevalence, Extent and Correlates of C-section delivery across the districts of Pakistan? (2) to explore the literature pertinent regarding cesarean section delivery in Pakistan. In this way the results of study may help the policy makers to control the unnecessary cesarean section rate.

2. Drivers of Cesarean Section Delivery in Pakistan: A Literature Survey

Many studies have been conducted to explore the socioeconomic factors of cesarean section delivery in past years. There have been some similarities in results and also found some differences. After analyzing the studies based on the common correlates of C-section deliveries, we can identify several determinants of cesarean deliveries in Pakistan. These determinants are: maternal age, women's educational status, wealth or socioeconomic status, urban residency, delivering in private hospitals, the fear of normal delivery (tocophobia), lack of awareness about C-sections. Khan and Zaman (2010) and Mumtaz et al. (2017) both found that maternal age is positively associated with C-section deliveries. Older mothers tend to have a higher likelihood of undergoing C-sections. Khan and Zaman (2010), Mumtaz et al. (2017), Ali et al. (2018), and Choudary et al. (2021) highlighted the positive correlation between education and C-section rates.

Women with higher education levels were more likely to have C-sections. Mumtaz et al. (2017), Ali et al. (2018), and Noh et al. (2019) suggested that urban residence was associated with an increased likelihood of C-section deliveries. Urban areas have better access to healthcare facilities and elective C-sections. Mumtaz et al. (2017), Ali et al. (2018), and Choudary et al. (2021) highlighted the role of socioeconomic factors in decision-making regarding delivery mode. They indicated that wealthier women were more likely to undergo C-sections. Ali et al. (2018) and Amjad et al. (2018) both emphasized that delivering in private hospitals was associated with a higher likelihood of C-sections. Private healthcare settings may have different practices and incentives.

Table 1: Literature on the Correlates of C-Section delivery in Pakistan (2010-2021)

Authors (year)	Economy	Dependent Variable	Independent Variables	Data type (Time period)	Analytical Technique Applied
Khan and Zaman (2010)	Pakistan	Cost of delivery	maternal age (+), education(+), parity(-), maternal co-morbidities(+),birth weight of baby(+), socio-economic status(+), length of stay(+)	Cross sectional survey 10 April- 10 May 2008	Non parametric bootstrapping
Mumtaz et al. (2017)	Pakistan	C-section delivery	Maternal greater age(+), education(+), urban residence(+), not working female(+), richest females(+),Punjab, Sindh, ICT provinces females more likely and private place of delivery (-)	Cross-sectional data 1990-2013	Multivariable logit regression
Ali et al. (2018)	Pakistan	Mode of delivery (N/C)	time convenience for doctors(+), patient preferences(+) , private(+) and public hospitals(-), income status(+),rural residence(-) and education(+)	Primary data	MCDM
Amjad et al. (2018)	Pakistan	C-section delivery	women who receive more number of ANC visits(+) , living in urban area(+), having high risk of	Cross-sectional data 2012-2013	Binary logistic regression

			pregnancy complications(+), who delivered at private hospitals(+), women age >24 at 1st birth(+), women who lived in Punjab province(+) as compared to other province, women belong to richest family(+), having higher education(+) and women employed at professional/ technical/ managerial level(+), birth order(-) and rural area residence(-		
Noh et al. (2019)	Pakistan	place of birth (public/private)	age(+), education(+), household wealth(+), birth order(-), urban residence(+), wealth status(+)	Pooled data 2013-14	Generalized linear model
Amjad, Usman, et al. (2020)	Pakistan	Mode of delivery	Family trend of CS(+),previous good experience of CS(+),higher socio economic status(+),fear of normal birth(+),lack of awareness about CS delivery(+).	Leading maternity hospital Lahore may-sept 2019	Thematic content analysis
Choudary et al. (2021)	Pakistan	C-section delivery	Age (+), Edu (+), wealthier women (+), tocophobia (+), urban residence (+), rural residence (-).	Cross sectional survey data Nov 2019-march 2020	Logistic regression model

3. Data and Methodology

In order to discover the factors of cesarean section delivery in Pakistan, we made a literature survey of 50 studies that conducted in Pakistan and at global level. The studies covered a time period from 1999 to 2021. For the purpose of exploring the prevalence and determinants of cesarean section delivery across the districts of Pakistan, Pakistan Demographic and Household Survey (PDHS 2017-18) data has use. The Pakistan Demographic and Health survey is a fourth survey (PDHS 2017-18) conducted in Pakistan as a part of DHS international series and follows surveys in 1990-91, 2006-7 and 2012-13. Cross sectional data has been used in this study. This study having >12000 ever-married females and descriptive statistics has been calculated by using SPSS and MS Excel software.

Table 2

Classes	Range	Interval
Very high	48 to 63	16
Moderately high	32 to 47	16
High	16 to 31	16

In table 2, for showing the prevalence of cesarean section delivery, on the basis of equal interval '16' three classes are prepared. Maximum value of CS rate is 63 and minimum value is 15. (Range Max-Min 63-15=48 and (48/3=16). First class show very high CS rate that lies in range 48 to 63, second class show moderately high CS rate that lies in range 32 to 47 and third class show highly CS rate that lies in range 16 to 31. "Three" districts lie in very high range, "seventeen" districts lie in moderately high range and "forty-nine" districts lies in highly CS range. In this range of 16 to 31 many districts lie that are 49.

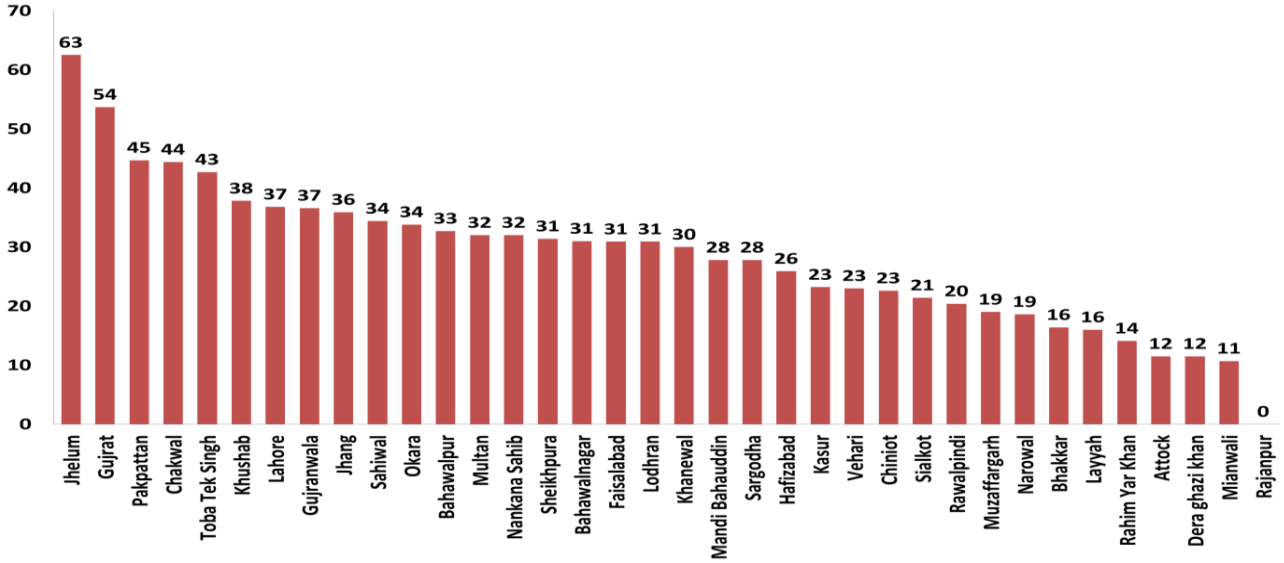
4. Results and Discussion

This section introduces the district wise percentage of cesarean section delivery.

4.1. District Wise Percentages of CS Delivery in Province Punjab

District wise CS delivery rate was arranged into descending order. In Punjab province, districts that has CS delivery rate above 15% were 31 Bahawalnagar, Bahawalpur, Bhakkar, Chakwal, Chiniot, Faisalabad, Gujranwala, Gujrat, Hafizabad, Jhang, Jhelum, Kasur, Khanewal, Khushab, Lahore, Layyah, Lodhran, Mandi Bahauddin, Multan, Muzaffargarh, Nankana Sahib, Narowal, Okara, Pakpattan, Rawalpindi, Sahiwal, Sargodha, Sheikhupura, Sialkot, Toba Tek Singh and Vehari, districts that lies with range of 5-15% CS delivery rate were 4 Attock, Dera ghazi khan, Mianwali and R.Y.K however only 1 district has CS delivery rate below 5% Rajanpur.

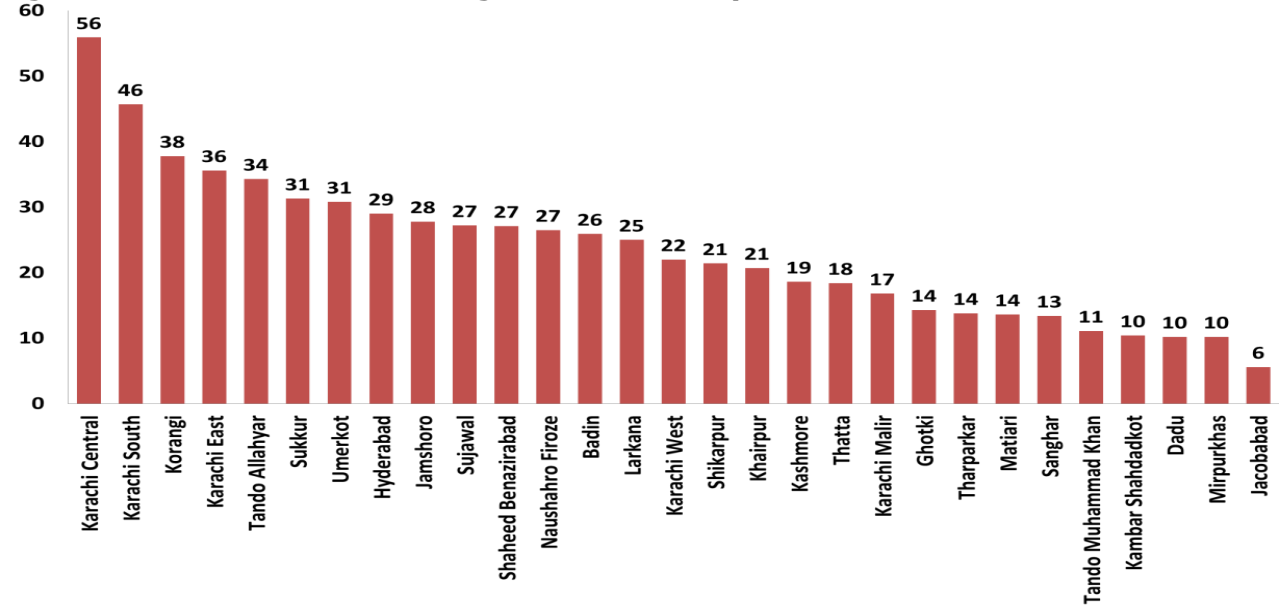
Figure 1: District Wise Percentages of CS Delivery in Province Punjab



4.2. District Wise Percentages of CS Delivery in Sindh Province

In Sindh province, districts that has CS delivery rate above 15% were 20 Karachi central, Karachi south, Korangi, Karachi East, Tando Allah Yar, Sukkur, Umerkot, Hyderabad, Jamshoro, Sujawal, Shaheed Benazirabad, Noushahro Firoze, Badin, Larkana, Karachi west, Shikarpur, Khairpur, Kashmore, Thatta, Karachi malir, 9 districts have CS delivery rate between 5-15% includes Ghotki, Tharparkar, Matiari, Sanghar, Tando Muhammad khan, kambar shahdadkot, Dadu, Mirpurkhas and Jacobabad.

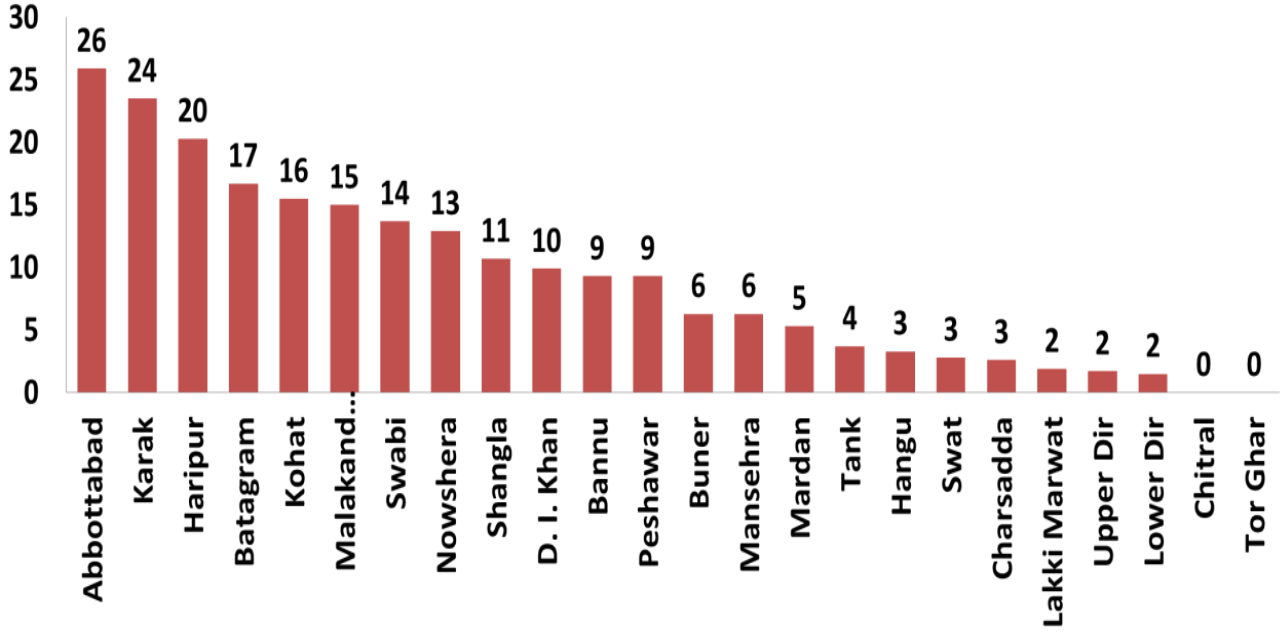
Figure 2: District Wise Percentages of CS Delivery in Sindh Province



4.3. District Wise Percentages of CS Delivery in Province of KPK

In KPK, five districts have CS delivery rate above 15% include Abbottabad, Karak, Haripur, Batagram and Kohat, districts that lies with range of 5-15% CS delivery rate were 2 Swabi and Now Shera and districts that has CS delivery rate below 5% were 8 Hangu, Swat, Charsadda, Laki Marwat, Upper Dir, Lower Dir, Chitral and Tor Ghar.

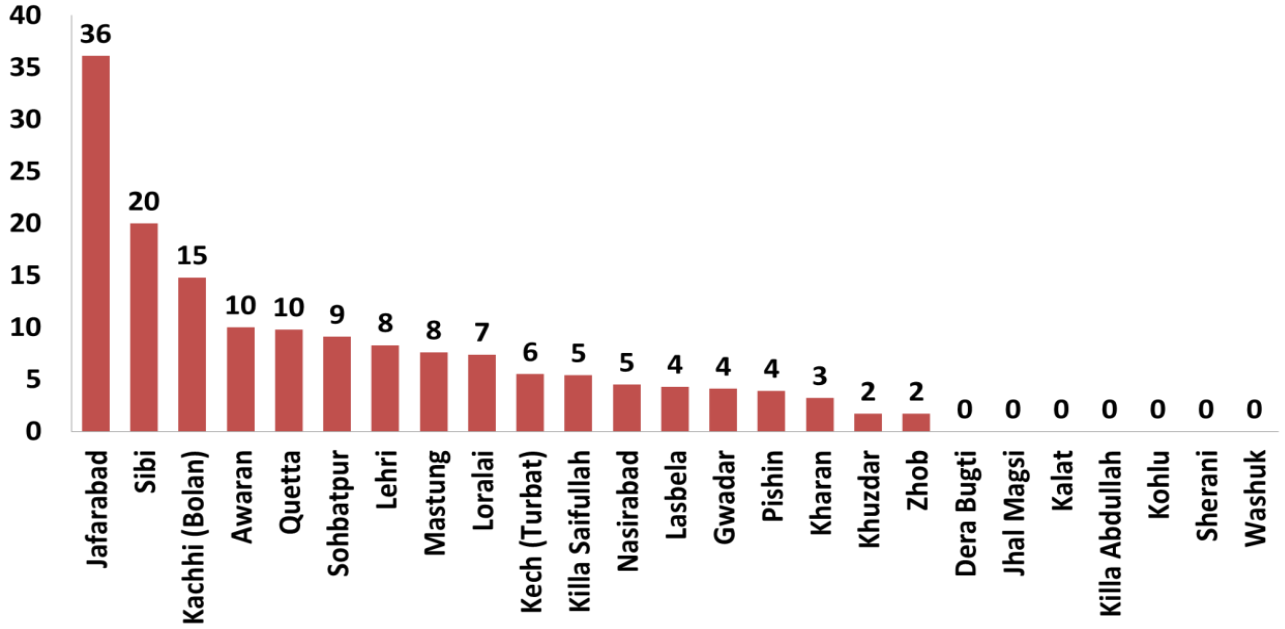
Figure 3: District Wise Percentages of CS Delivery in KPK Province



4.4. District Wise Percentages of CS Delivery in Province of Baluchistan

In Baluchistan, districts that have CS delivery rate above 5% was only 2 Jafarabad and Sibi, Districts that lies with range of 5-15% CS delivery rate were 9 Kachhi, Awaran, Quetta, Sohbatpur, Lehri, Mastung, Loralai, Kech and Killa Saifullah, however CS delivery rate below 5% are presented in 14 districts Nasirabad, Lasbela, Gwadar, Pishin, Kharan, Khuzdar, Zhob, Dera bugti, Jhal magsi, Kalat, Killa Abdullah, Kohlu, Sherani and Washuk.

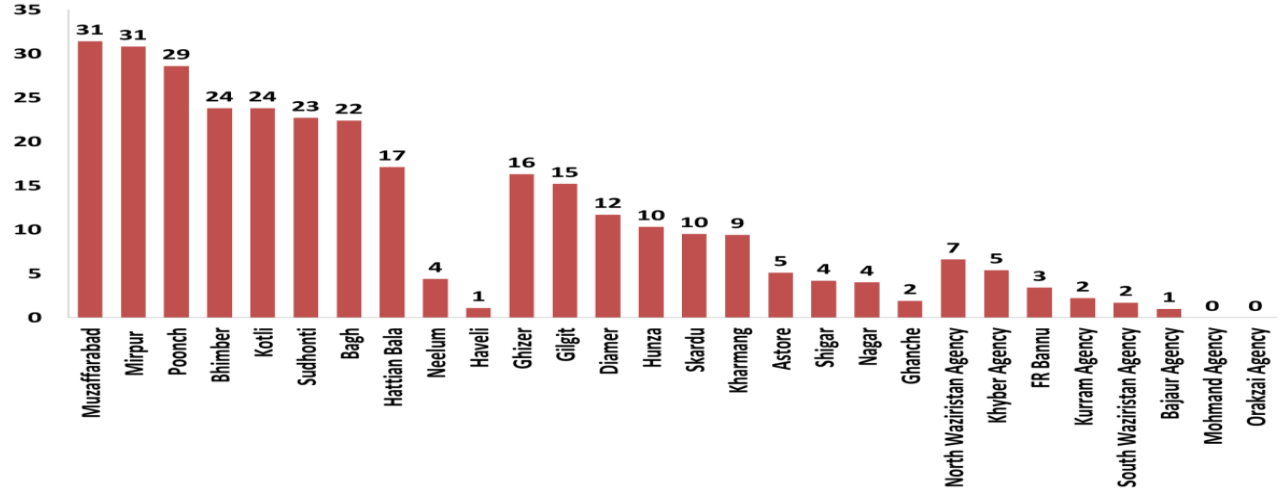
Figure 4: District Wise Percentages of CS Delivery in Baluchistan Province



District Wise Percentages of CS Delivery in Province AJK, GB and FATA

In AJK, districts that has CS delivery rate above 15% were 8 Muzaffarabad, Mirpur, Poonch, Bhimber, Kotli, Kotli, Kotli, Hattian Bala, distict that has CS delivery rate with range of 5-15% was 0 and 2 districts has CS delivery rate below 5% Neelum and Haveli.

Figure 5: District Wise Percentages of CS Delivery in AJK, GB, and FATA Regions



In GB, districts that has CS delivery rate above 15% were 2 Ghizer, Gilgit, distict that has CS delivery rate with range of 5-15% were 5 Diamer, Hunza, Skardu, Kharmang, Astore and 3 districts has CS delivery rate below 5% Shigar, Nagar and Ghanche. In FATA, districts that has CS delivery rate with range of 5-15% was 2 North Waziristan Agency, Khyber Agency and 6 districts has CS delivery rate below 5% FR Bannu, Kurram Agency, South Waziristan Agency, Bajaur Agency, Mohmand Agency and Orkzai Agency.

Table 3

District	Rank	% CS Delivery	Province
Jhelum	1	62.5	Punjab
Karachi Central	2	55.9	Sindh
Gujrat	3	53.7	Punjab
Karachi South	4	45.7	Sindh
Pakpattan	5	44.7	Punjab
Chakwal	6	44.4	Punjab
Toba Tek Singh	7	42.7	Punjab
Khushab	8	37.8	Punjab
Korangi	9	37.8	Sindh
Lahore	10	36.8	Punjab
Gujranwala	11	36.6	Punjab
Jafarabad	12	36.1	Balochistan
Jhang	13	35.9	Punjab
Karachi East	14	35.6	Sindh
Sahiwal	15	34.4	Punjab
Tando Allahyar	16	34.3	Sindh
Okara	17	33.8	Punjab
Bahawalpur	18	32.7	Punjab
Multan	19	32	Punjab
Nankana Sahib	20	32	Punjab
Sheikhpura	21	31.4	Punjab
Muzaffarabad	22	31.4	AJK
Sukkur	23	31.3	Sindh
Bahawalnagar	24	31	Punjab
Faisalabad	25	30.9	Punjab
Lodhran	26	30.9	Punjab
Umerkot	27	30.8	Sindh
Mirpur	28	30.8	Sindh
Khanewal	29	30	Punjab
Hyderabad	30	29	Sindh
Islamabad	31	28.9	Capital
Poonch	32	28.6	AJK
Mandi Bahauddin	33	27.8	Punjab

Sargodha	34	27.8	Punjab
Jamshoro	35	27.8	Sindh
Sujawal	36	27.2	Sindh
Shaheed Benazirabad	37	27.1	Sindh
Naushahro Firoze	38	26.5	KPK
Hafizabad	39	25.9	Punjab
Badin	40	25.9	Sindh
Abbottabad	41	25.9	KPK
Larkana	42	25	Sindh
Bhimber	43	23.8	AJK
Kotli	44	23.8	AJK
Karak	45	23.5	KPK
Kasur	46	23.2	Punjab
Vehari	47	23	Punjab
Sudhonti	48	22.7	AJK
Chiniot	49	22.6	Punjab
Bagh	50	22.4	AJK
Karachi West	51	22	Sindh
Sialkot	52	21.4	Punjab
Shikarpur	53	21.4	Sindh
Khairpur	54	20.7	Sindh
Rawalpindi	55	20.4	Punjab
Haripur	56	20.3	Baluchistan
Sibi	57	20	Baluchistan
Muzaffargarh	58	19	Punjab
Narowal	59	18.6	Punjab
Kashmore	60	18.6	Sindh
Thatta	61	18.4	Sindh
Hattian Bala	62	17.1	AJK
Karachi Malir	63	16.8	Sindh
Batagram	64	16.7	Baluchistan
Bhakkar	65	16.4	Punjab
Ghizer	66	16.3	GB
Layyah	67	16	Punjab
Kohat	68	15.5	KPK
Gilgit	69	15.2	GB

In this table "3" districts lie in very high range, "17" districts lies in moderately high range and "49" districts lies in highly CS range. Overall above 69 districts are lies in >15 CS rates range that are not recommended by WHO, and remaining districts are lies in below range of CS rate ≤ 15.

4. Conclusion

The caesarean section is an important surgical procedure to deliver one or more than one child. But unnecessary cesarean section delivery has health challenges for females and child. Micro data has been used collected from Pakistan Demographic and Health Survey 2017-18. The study concluded that there are total 143 districts in Pakistan, out of which in 69 districts CS rate are above 15% and in 31 districts CS rate are below 5%, only 43 districts have CS delivery rates in normal range of 5-15%.

In some districts where CS rate are below 5% health facilities are insufficient and where CS rate are above 15%, excess of health facilities and unnecessary use of such practice. Due to which child and mother mortality increase. This study helps to point out the areas of need of this method. The geographical targeting could be feasible method to allocate the resources for cesarean section delivery.

References

Abbas, F., Amir ud Din, R., & Sadiq, M. (2018). Prevalence and determinants of Caesarean delivery in Punjab, Pakistan. Eastern Mediterranean Health Journal, 24(11).

Ali, Y., Khan, M. W., Mumtaz, U., Salman, A., Muhammad, N., & Sabir, M. (2018). Identification of factors influencing the rise of cesarean sections rates in Pakistan, using MCDM. International journal of health care quality assurance.

Allen, V. M., O'Connell, C. M., Liston, R. M., & Baskett, T. F. (2003). Maternal morbidity associated with cesarean delivery without labor compared with spontaneous onset of labor at term. Obstetrics & Gynecology, 102(3), 477-482.

Amjad, A., Amjad, U., Zakar, R., Usman, A., Zakar, M. Z., & Fischer, F. (2018). Factors associated with caesarean deliveries among child-bearing women in Pakistan: secondary analysis of data from the demographic and health survey, 2012–13. BMC pregnancy and childbirth, 18(1), 1-9.

Bhatia, M., Banerjee, K., Dixit, P., & Dwivedi, L. K. (2020). Assessment of variation in cesarean delivery rates between public and private health facilities in India from 2005 to 2016. JAMA network open, 3(8), e2015022-e2015022.

Buowari, Y. D. (2012). Indications for caesarean section at a Nigerian District Hospital. Nigerian Health Journal, 12(2), 43-46.

Choudary, A., Siraj, A., Tariq, H., Chughtai, F., & Urooj, U. (2021). Ethical dilemma of cesarean section on maternal request (CSMR). PAFMJ, 71(2), 535-539.

Cook, J., Jarvis, S., Knight, M., & Dhanjal, M. (2013). Multiple repeat caesarean section in the UK: incidence and consequences to mother and child. A national, prospective, cohort study. BJOG: An International Journal of Obstetrics & Gynaecology, 120(1), 85-91.

Dorji, T., Wangmo, K., Dorjey, Y., Dorji, N., Kiran Chhetri, D., Tshering, S., . . . Tshokey, T. (2021). Indications and factors associated with cesarean section in Bhutan: A hospital-based study. International Journal of Gynecology & Obstetrics, 153(3), 520-526.

Gerard Jansen, A., Duvekot, J. J., Hop, W. C., Essink-Bot, M.-L., Beckers, E. A., Karsdorp, V. H., . . . Van Rhenen, D. J. (2007). New insights into fatigue and health-related quality of life after delivery. Acta obstetricia et gynecologica Scandinavica, 86(5), 579-584.

Gibbons, L., Belizán, J. M., Lauer, J. A., Betrán, A. P., Merialdi, M., & Althabe, F. (2010). The global numbers and costs of additionally needed and unnecessary caesarean sections performed per year: overuse as a barrier to universal coverage. World health report, 30(1), 1-31.

Häger, R. M., Daltveit, A. K., Hofoss, D., Nilsen, S. T., Kolaas, T., Øian, P., & Henriksen, T. (2004). Complications of cesarean deliveries: rates and risk factors. American journal of obstetrics and gynecology, 190(2), 428-434.

Hebert, P. R., Reed, G., Entman, S. S., Mitchel Jr, E. F., Berg, C., & Griffin, M. R. (1999). Serious maternal morbidity after childbirth: prolonged hospital stays and readmissions. Obstetrics & Gynecology, 94(6), 942-947.

Joseph, P., Ann, M., Loise, J., Marion, S., & Rosemary, E. (1988). Medical dictionary: A concise and up-to-date guide to medical terms. In: Houghton Mifflin Company, USA.

Karim, F., Ali, N. B., Khan, A. N. S., Hassan, A., Hasan, M. M., Hoque, D. M. E., . . . Chowdhury, M. A. K. (2020). Prevalence and factors associated with caesarean section in four Hard-to-Reach areas of Bangladesh: Findings from a cross-sectional survey. PloS one, 15(6), e0234249.

Keag, O. E., Norman, J. E., & Stock, S. J. (2018). Long-term risks and benefits associated with cesarean delivery for mother, baby, and subsequent pregnancies: Systematic review and meta-analysis. PLoS medicine, 15(1), e1002494.

Manyeh, A. K., Amu, A., Akpakli, D. E., Williams, J., & Gyapong, M. (2018). Socioeconomic and demographic factors associated with caesarean section delivery in Southern Ghana: evidence from INDEPTH Network member site. BMC pregnancy and childbirth, 18(1), 1-9.

Marshall, N. E., Fu, R., & Guise, J.-M. (2011). Impact of multiple cesarean deliveries on maternal morbidity: a systematic review. American journal of obstetrics and gynecology, 205(3), 262. e261-262. e268.

Miri Farahani, L., & Abbasi Shavazi, M. J. (2012). Caesarean section change trends in Iran and some demographic factors associated with them in the past three decades. Journal of Fasa University of Medical Sciences, 2(3), 127-134.

Movahed, M., Enayat, H., Ghaffarinasab, E., Alborzi, S., & Mozafari, R. (2012). Related factors to choose cesarean rather than normal delivery among Shirazian pregnant women. Journal of Fasa University of Medical Sciences, 2(2), 78-83.
Mumtaz, S., Bahk, J., & Khang, Y.-H. (2017). Rising trends and inequalities in cesarean section rates in Pakistan: Evidence from Pakistan Demographic and Health Surveys, 1990-2013. PloS one, 12(10), e0186563.
Murphy, D., Stirrat, G., & Heron, J. (2002). The relationship between Caesarean section and subfertility in a population-based sample of 14 541 pregnancies. Human Reproduction, 17(7), 1914-1917.
Nations, U. (2015). Transforming our world: The 2030 agenda for sustainable development. New York: United Nations, Department of Economic and Social Affairs.
Nazir, S., & Cready, C. (2020). The C-Section Epidemic in Pakistan. Retrieved from
NIH, & NIH. (2006). State-of-the-Science Conference Statement on cesarean delivery on maternal request. NIH Consens State Sci Statements, 23, 1-29.
Owen, J., & Andrews, W. W. (1994). Wound complications after cesarean sections. Clinical obstetrics and gynecology, 37(4), 842-855.
Samdal, L. J., Steinsvik, K. R., Pun, P., Dani, P., Roald, B., Stray-Pedersen, B., & Bøhler, E. (2016). Indications for cesarean sections in rural Nepal. The Journal of Obstetrics and Gynecology of India, 66(1), 284-288.
Schuitemaker, N., van Roosmalen, J., Dekker, G., Van Dongen, P., Van Geijn, H., & Gravenhorst, J. B. (1997). Maternal mortality after cesarean section in The Netherlands. Acta obstetricia et gynecologica Scandinavica, 76(4), 332-334.
Timor-Tristch, I., & Monteagudo, A. (2013). Unforeseen Consequences of the Increasing Rate of Cesarean Deliveries: Early Placenta Accreta and Cesarean Scar Pregnancy A Review. Obstetric Anesthesia Digest, 33(4), 188-189.