

## RESEARCH ARTICLE

## Indications of caesarean section in pregnant women attending a public maternity teaching hospital and private hospitals in Sulaimani city Iraq

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### Abstract

**Objective:** To determine the frequency and indications of caesarean sections among pregnant women in an urban setting.

**Method:** The cross-sectional study was conducted from October 1, 2021, to February 1, 2022, at public-sector Maternity Teaching Hospital and private-sector Baxshin and Harem hospitals in Sulaimani, Iraq, after approval from the ethics review committee of the College of Health and Medical Technology, Sulaimani. The sample comprised pregnant women who were admitted to the maternity wards and who underwent caesarean section. Data was collected using a predesigned questionnaire filled through face-to-face interviews individually. Data was analysed using SPSS 25.

**Results:** There were 474 pregnant women with mean age  $28 \pm 6.87$  years. Of the total, elective caesarean section cases were 384(81%) and emergency cases were 90(19%). The main indications of caesarean section were mother's request 266(56.2%), fear of pain in natural vaginal delivery 375(79.1%), history of previous caesarean section 38(8%), cephalopelvic disproportion 26(5.5%), history of diabetes 21(4.4%), pre-eclampsia 19(4%) and bad obstetric history/infertility 10(2.1%). Age, parity, previous history of caesarean section and mother's occupation were significantly associated with the type of caesarean section ( $p < 0.05$ ).

**Conclusion:** Caesarean section rates were found to be much higher than recommended.

**Keywords:** Prevalence, Caesarean section, Indications, Sulaimani city, Iraq. **DOI:** <https://doi.org/10.47391/JPMA.IQ-18>

### Introduction

Caesarean section (CS), also known as caesarean delivery (CD) or simply C-section, is a surgical operation in which foetus or foetuses is or are delivered via an incision in the abdominal wall and the uterus.<sup>1,2</sup> It is a life-saving procedure normally utilized when certain delivery-related or pregnancy-related complications arise. It is typically performed when a natural vaginal delivery (NVD) poses a risk to the mother and/or the foetal health. However, it can also be requested by the mother. Nowadays, CSs are becoming more common, and they are often performed even without obstetric or medical indications. Despite its benefits, this major operation has many potential complications that may cause a permanent damage or can even be life-threatening for the foetus as well as for the mother in terms of future pregnancies.<sup>1,3</sup> CS is a necessary procedure in certain situations. However, currently undergoing CS is viewed as a luxury among some

communities rather than a medical necessity.<sup>4</sup> Currently, it is the most commonly performed operation in the United States, with more than a million pregnant women undergoing CS every year.<sup>1</sup> CS is an absolute necessity when Normal Vaginal Delivery would put the mother or the foetus at high risk of morbidity and mortality. The most common reasons for a medically justified CS are failure of labour, multiple pregnancies, breech presentation or severe hypertension (HTN), causing complicated pregnancy, pre-eclampsia, or problems associated with the placenta or the umbilical cord.<sup>5,6</sup> The first documented CS operation dates back to 1020, and since then, the procedure has massively progressed.<sup>7</sup> CS rates (CSRs) are on the rise globally. The World Health Organisation (WHO) revealed that 21% of births were through CS by June 2021.<sup>8</sup> Literature has shown that the expected global CS rate is  $\leq 13\%$ ,<sup>9</sup> and, according to the WHO, since 1985, the international healthcare community has considered the ideal rate to be between 10-15% for CS.<sup>10</sup> Since then, the CSRs have increased in both developed and developing countries. The current CSR is much higher than the optimal range recommended by the WHO.<sup>10</sup> In recent years, the average CSR has risen by 10-15% worldwide, and the possibility of a baby delivered through CS is 3 times greater what it was like in the preceding 20 years.<sup>11</sup> The rise of CSR varies among different countries.<sup>12</sup> Between 1990 and 2021,

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CSRs rose from 6.7% to 21% worldwide.<sup>13,14</sup> The largest rise in CSR is reported in Latin America and the Caribbean.<sup>14</sup>

The current study was planned to determine the frequency and indications of CS among pregnant women in an urban setting.

## Subjects and Methods

The cross-sectional study was conducted from October 1, 2021, to February 1, 2022, at public-sector Maternity Teaching Hospital (MTH) and private-sector Baxshin Hospital (BH) and Harem Hospital (HH) in Sulaimani, Iraq, after approval from the ethics review committee of the College of Health and Medical Technology, Sulaimani. All the participating hospitals function under the supervision of the Ministry of Health of the Kurdistan Regional Government, and permission was obtained from the General Directorate of Health, Sulaimani.

The sample size was calculated using the formula:<sup>15</sup>

$N = Z^2 \times P \times (1 - P) / D^2$  where N indicated the minimum required sample size,

Z was 1.96 at 95% confidence interval (CI), D indicated relative precision 5%, and P was prevalence 34.4% on the basis of a study done in Babylon Governorate of Iraq.<sup>16</sup> The sample size was inflated by >35% to increase the power of the study.

After permission from the administrations of the participating hospitals, the sample was raised using convenience sampling technique. Those included were pregnant women who were admitted to the maternity wards and who underwent CS and those excluded were all pregnant woman who delivered by NVD, any woman who was not admitted and delivered outside the maternity ward of these hospitals within the study period, and the participants in the pilot study.

After taking informed consent from the subjects, data was collected using a predesigned questionnaire based on relevant studies.<sup>16,17</sup> The questionnaire was modified to make it relevant to the local context and the goals of the study. The questionnaire was filled in through face-to-face interview, with each interview lasting about 10-15 minutes either on the day of the CS or the day after the surgery.

The questionnaire had four sections. The first section was composed of socio-demographic questions, such as age, residence, level of education, occupation and socio-economic status (SES). The second section contained obstetrical information, such as parity, history of

miscarriage, history of CS, and type of CS. The third section focussed on women's perception, such as fear of NVD. The fourth section contained indications of CS delivery, such as mother's request, cephalopelvic disproportion, failure of labour progress / induction, history of CS surgery, foetal distress, multiple pregnancy and diabetes. An expert panel verified the content validity, and Cronbach's alpha coefficient test confirmed the reliability of the questionnaire with a value of 0.81.

Data was analysed using SPSS 25. Frequencies and percentages were used to express categorical variables, while continuous variables were expressed as mean  $\pm$  standard deviation. Chi-square test was used to determine the association between categorical variables.  $P \leq 0.05$  was considered statistically significant.

## Results

There were 474 pregnant women with mean age  $28 \pm 6.87$  years, and those aged 29-38 years formed the largest group 250(52.7%) (Table 1). The main CS indications were mother's request 266(56.2%), fear of NVD pain 375(79.1%), history of CS 38(8%), cephalopelvic disproportion 26(5.5%), history of diabetes 21(4.4%), pre-eclampsia 19(4%) and bad obstetric history/infertility 10(2.1%) (Figure 1).

Of the total, elective CS cases were 384(81%) and emergency cases were 90(19%) (Figure 2). Hospital-wise breakdown was noted individually, with HH showing CSR of 100%, followed by BH and the public-sector MTH (Table 2, Figure 3).

Age, parity, CS history and mother's occupation were significantly associated with CS type (Table 3).

**Table-1:** Demographic and obstetric characteristics (n=474).

Variables	n (%)
<b>Age (years)</b>	
<19	6 (1.3)
19-28	150 (31.6)
29-38	250 (52.7)
39-48	68 (14.3)
<b>Education level</b>	
Illiterate	181 (38.2)
Basic school	90 (19.0)
High school	43 (9.1)
Diploma	94 (19.8)
Bachelor	61 (12.9)
Post-graduate	5 (1.1)
<b>Occupation</b>	
House wife	347 (73.2)
Governmental employee	79 (16.7)
Private employee	39 (8.2)

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**Table-1:** continued from previous page

Variables	n (%)
Student	9 (1.9)
<b>Residency</b>	
Inside city	272 (57.4)
Outside city	202 (42.8)
<b>Economic Status</b>	
Low income	40 (8.4)
Middle income	349 (73.6)
High income	85 (17.9)
<b>Parity</b>	
Primipara	90 (19)
Multi para	3848 (1)

**Table-2:** Demographic and obstetric characteristics (n=474).

Name and types of hospitals	Rate of CS and NVD		Total n (%)	* p-value
	n (%) of CS	n (%) of NVD		
Maternity teaching public hospital	1580(36.48)	2750(63.52)	4330(100)	0.02
Baxshin private hospital	550(78.34)	152 (21.66)	702(100)	
Harem private hospital	425(100)	(0)(0)	425(100)	

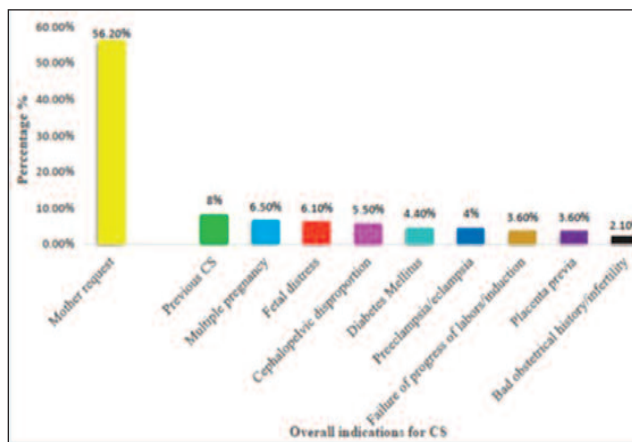
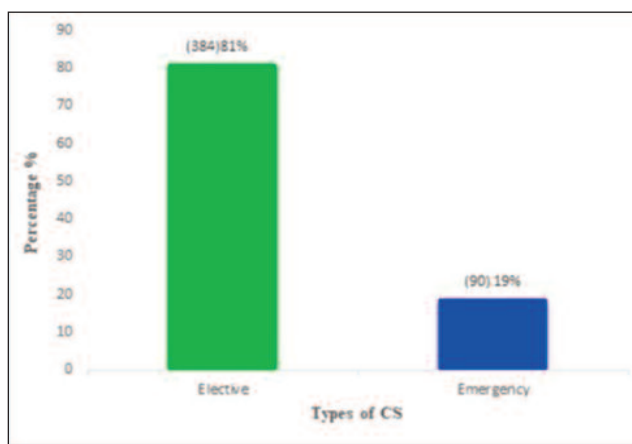
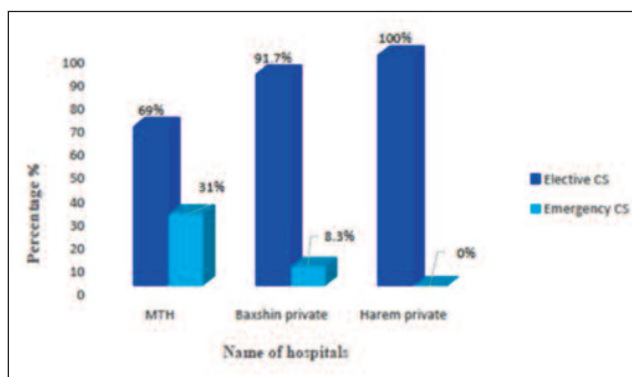
\*Chi-square test was used for statistical analysis; CS= Caesarian Section NVD- Normal Vaginal Delivery

**Table-3:** Association between types of caesarean section (CS) with age, parity, previous history and occupation of the study participants (n=474).

Variables	Types of CS		Total	p-value
	Elective n (%)	Emergency n (%)		
<b>Age /years</b>				
<19	5(83.3%)	1(16.7%)	6	0.02
19-28	113(75.3%)	37(24.4%)	150	
29-38	209(83.6%)	41(16.4%)	250	
39-48	57(83.8%)	11(16.2%)	68	
Total	384	90	474	
<b>Parity</b>				
Primiparous	59(65.6%)	31(34.4%)	90	0.001
Multiparous	325(84.6%)	59(15.4%)	384	
Total	384	90	474	
<b>Previous CS</b>				
No	106(67.5%)	51(32.5%)	157	0.001
Yes	278(87.7%)	39(12.3%)	317	
Total	384	90	474	
<b>Occupation</b>				0.04
House wife	(271) 78.1%	(76) 21.9%	347	
Governmental/employee	(70) 88.6%	(9) 11.4%	79	
Private employee	(36) 92.3%	(3) 7.7%	39	
Student	(7) 77.8%	(2) 22.2%	9	
Total	384	90	474	

## Discussion

The current findings revealed that the CS rate was significantly high (36.4%) at the public hospital in Sulaimani city, which requires particular attention because it is approximately 3 times higher than the WHO recommendations.<sup>10</sup> The current finding is quite similar to

**Figure 1:** Association between the rates of caesarean section and normal vaginal delivery for public and private hospitals in Sulaimani city (n=474).**Figure 2:** Types of caesarean section (CS) (n=474).**Figure 3:** Types of caesarean section in public and private hospitals (n=474).

the findings of other studies conducted in similar public-sector hospitals in six Iraqi cities, including Sulaimani (34.6%)<sup>18</sup>, Erbil (35.77%),<sup>17</sup> Duhok (32.2%),<sup>17</sup> Kirkuk (33.8%),<sup>19</sup> Mosul (25.7%)<sup>20</sup> and Karbala (31.5%).<sup>21</sup>

In regional terms, similar CSR has been reported from the United Arab Emirates (UAE) (33%), Kuwait (34.7%) and

Jordan (37.5%). However, higher CSRs have been reported from Iran (48%), Saudi Arabia (55.4%), Syria (46%) and Turkey (53.1%).<sup>4, 22-27</sup>

Globally, similar CSR has been from the US (32%), Italy (36%), Chile and Mexico (45%), while significantly lower CSRs have been reported from Iceland (15%), Israel (15%), Sweden (16%) and Norway (17%).<sup>28</sup> This variation in CSR could be related to the women's right to select the childbirth method, which was established first in Brazil.<sup>29</sup> The rising trend in CSR of Iraq is in line with global and regional trends<sup>30</sup> that are mainly related to developments in foetal distress detection technology as well as physicians' and pregnant women's beliefs related to CS, such as the ability to avoid labour discomfort.<sup>30</sup> Additionally, different cultures, wrong attitudes toward NVD, a lack of facilities for NVD, and the etiquette or behaviours of healthcare workers may all contribute to these discrepancies.<sup>31</sup>

In the current study, the commonest indication for CS was mother's request (56.2%), followed by previous CS (8%) and multiple pregnancy (6.5%). One of the causes of high maternal request for CS, without the presence of any medical reason, was to avoid NVD labour pain (79.1%) in the current study, which is in line with an earlier Iraqi study (77.2%),<sup>16</sup> while another study showed that the most common indication was mother's request (36.63%).<sup>17</sup>

In the current study, CS type was associated with low educational and SES levels. Educational level was also highlighted by a previous study conducted at the MTH in Sulaimani,<sup>18</sup> and a study in Iran.<sup>31</sup> This may be rationalised by the fact that people with low educational level pay less attention to antenatal care (ANC), which promotes NVD.<sup>32</sup>

The current finding related to the occupation of mothers was consistent with a study done in Iran.<sup>34</sup>

The current study found that mothers who were financially privileged were more likely to deliver by CS in private hospitals than those who took recourse to public-sector facilities. The Kurdistan Region of Iraq has witnessed rapid development of private hospitals that are also inadequately regulated, which could be responsible for the spike in elective CS in private hospitals.<sup>19</sup>

Also, the low availability of assisted NVD tools, such as forceps and vacuum extraction, in the Kurdistan Region might have caused the increase in CSR.<sup>19</sup> The rate of assisted NVD is about 5% in the US.<sup>34</sup>

The current study found a significant relationship of CS type (elective or emergency) with age, parity, CS history and mother's occupation, which confirmed earlier findings.<sup>35</sup>

To study CS indications, establishing an audit and medical committee, especially in private hospitals, and providing professional training are the tools that should be used to reduce the rising CSR trend. Pregnant women should be made aware of possible CS complications, and they should be motivated to opt for CS only when it is medically essential.

## Conclusion

CSR was higher in private-sector hospitals than the public-sector hospital, but it was overall substantially higher than the WHO recommendations. Elective CS was greater than emergency CS in private hospitals, and it was lower in the public hospital. In both types of hospitals, the most frequent CS indications were maternal request, fear of NVD pain.

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