

Maternal Outcomes among Women Undergoing Cesarean Section at a Maternity Hospital in Mosul City, Iraq: A Cross-Sectional Study

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ABSTRACT

Background: Cesarean section is commonly performed obstetric surgical procedure and has become an essential intervention for reducing maternal morbidity and mortality when vaginal delivery is not safe. It carries complications such as hemorrhage, need for blood transfusion, surgical site infection, uterine atony, admission to intensive care unit, and in severe cases, emergency hysterectomy or maternal death.

Objectives: highlighted on socio-demographic factors and its association on maternal out-come women underwent CS in maternity hospital in Mosul city.

Methods: A cross-sectional study was conducted among 1221 pregnant women underwent caesarian section in Al-Batool Teaching Maternity Hospital and Al-Mosul General Hospital, over a six months 1st (January–July) 2026. Using data collection form consisting from three sections: Socio-demographic, maternal cause of cesarian section and maternal outcome with closed ended question (yes and no) the mean score was used with cut off-point (1.5). The Z₂ Proportion Test was used to compare different variable between two hospitals with 95% C.I. Chi-square continuity is used to compare between variables. P-value ≤ 0.05 was considered significant.

Results: It revealed 612 (50.1%) of study sample undergone caesarian section in age groups (21-30). Primary educational level was 591(48.4%) among study sample. Two third (62.8%) of participant were urban. Women underwent emergency C/S were 871 (71.3) and those with one scar were 565 (46.3%). The commonest maternal causes of cesarian section in Al-Batool Teaching Maternity Hospital were previous scar 350 (55.3%) and in Al-Mosul General Hospital was failure to progress 127 (21.65%). The most common maternal outcomes were intensive care unit admission (20.3%), uterine atony (8.3%), need for blood transfusion (8.2%) with P-value (0.000). Highest maternal complication were seen among women with age group 40 years and more. ICU admission falls gradually from (29.9%) among illiterate mothers to (9.0%) among university and higher education mothers. Nearly two third of women with maternal complication were had no antenatal care and (48.6%) were multipara

Conclusion: Although nearly half of participant had had maternal outcome but mean score assessment of maternal outcome not reach cut-off point. Its presence frequently associated with multipara, women aged more than 40, illiterate and those with absence of antenatal care that required adequate and frequent assessment during pregnancy with insurances of the continuous availability of blood products, uterotonic agents, and intensive care beds at both maternity hospitals to improve maternal outcome.

Introduction

Cesarean section (CS) is one of the most commonly performed obstetric surgical procedures worldwide and has become an essential intervention for reducing maternal and neonatal morbidity and mortality when vaginal delivery is not safe [1]. Its categorized into elective cesarean section, which is planned before the onset of labor scheduled under controlled circumstances after adequate maternal preparation and evaluation, [2] and emergency cesarean section, which is carried out urgently because of maternal or fetal complications frequently associated with adverse outcomes compared with elective procedures [3,4]. Recently cesarean delivery rate has increased significantly due to multiple factors such as rising maternal age, increased prevalence of high-risk pregnancies, fetal distress, previous cesarean scars, maternal request, and advances in obstetric care [5]. Globally its rates increased from 6% in 1990 to 21% in 2018 with expectation to reach nearly 30% by 2030 [6]. Although CS is a life-saving intervention for conditions such as antepartum hemorrhage, fetal distress, malpresentation, obstructed labor etc., but at the same time exposes women to avoidable surgical and an anesthetic risks without a corresponding improvement in maternal or neonatal health outcomes [6,7]. The World Health Organization (WHO) recommended maximum CS's level is (15%), yet the majority of countries, including developing countries now markedly exceed this threshold. Predictions indicate that 38 million women will give birth by caesarean section in 2030, and 88% of these operations will occur in low- and middle-income countries [7,8]. CS carries a distinct maternal morbidity profile compared with vaginal delivery. Recognized complications include postpartum haemorrhage, need for blood transfusion, surgical site infection, uterine atony, admission to intensive care unite (ICU), and, in severe cases, emergency hysterectomy or maternal death [8,9].

In Basra- Iraqi, 2025 a cross-section study among (206) women in childbearing age found that maternal complications following CS, including infection and delayed wound healing, were significantly more common among obese, and maternal educational level, parity and previous scar were also linked to complication rates [10]. Another study in Dyala, 2023 among (130) single-tone pregnant women with a prior CS reported that repeat CS was associated with surgical site infections, underscoring the cumulative risk associated with rising repeat-CS rates in the country [11]. A study evaluating a crash CS protocol in Jeddah, Saudi Arabia, 2025 reported that timely decision-to-delivery intervals were very important in minimizing adverse maternal outcomes during emergency CS [12].

In Mosul, a city that has witnessed extensive damage to its healthcare infrastructure in recent years, maternity services remain in the process of being rebuilt. Most available Iraqi data come from Baghdad, Basra, and Diyala, leaving a gap in understanding how local obstetric practices, patient risk profiles, and health-system constraints in Mosul affect pregnancy and cesarean section outcomes. This study aims to examine the socio-demographic factors associated with pregnancy and cesarean section outcomes among pregnant women in maternity hospitals in Mosul.

Methods

A cross-sectional study was carried out over a period of six months (1st January– 1st July 2026) among pregnant women underwent C/S whether emergency or elective using simple random sampling technique of mothers (1221) from two maternity hospitals (Al-Batool Teaching Maternity Hospital (634) and Al-Mosul General Hospital (587). Women underwent C/S in private hospitals, those with incomplete form and /or refuse to participate were excluded from the final analysis, they form (100). Approximately 40 cesarean sections were done daily in four governmental maternity Hospital in Mosul city 2016. per month were 1200 whether

elective or emergency. Per six months 7200. The present study reported that 1221 case among two hospitals, it represents 16.9% of all reported case in governmental maternity Hospital in Mosul city during study period. The information was collected by direct interview with participants with the assistance of research sub-committee members in health institutions in the Nineveh Health Directorate using data collection form included information from different resources, modification was done according to ethical consideration in our society with assistance of expertise in obstetrics and gynecology. Both face and content validity were assessed. Validity was done by reviewing the precision, easiness, and relevance of the items, and confirm that the items adequately covered the study purposes. The overall content validity index was 0.83, which is considered acceptable [13]. Reliability was estimated through a pilot study, where internal steadiness analysis was performed to confirm that the tool was stable and consistent results. A test–retest examination was done; the overall percentage agreement was 80% [14]. Data collection form included three sections. Section (1) [socio-demographic characteristic of study sample contain (10 items)], section (2) [maternal causes (12 items)], section (3) [maternal outcomes(7 items)].

All work is approved by scientific the ethical committee of Nineveh Health Directory / Ministry of Health / Iraq by licenses' number (272) in date (1st Sep 2025) protocol research number 2025225 after taking the agreement maternity hospital in Mosul city in Nineveh Health Directory and the informed consent was obtained from all participants prior to their participation in the study

Statistical analysis: The information regarding each participant was transferred into a code sheet, and data entry was done using an HP Core i5 8th-generation computer. Statistical analysis was done using Minitab version (19) and Excel version (19) was considered. The percent agreement was used to measure the reliability of questionnaire variability with the McNemar test to assess statistical significance between the test and retest examination; the equation is as follows [15]:

Percent agreement = Total agreement / Total number x 100

The data were presented in suitable tables. Percentages were calculated for the various group variables. A simple dichotomy (yes and no) was used, the mean score was calculated as follows:

(No. of correct answer × 2) + (No. of incorrect answer × 1) / total No. of sample size. The deviation of the score using the following formula: Cut-of point (2+1)/2=1.5

Z2 Proportion Test was used to compare different variables between two hospital groups with 95% C.I. Chi-square continuity is used to compare between variables and using (Fisher's exact test for 2x2 or Monte Carlo exact test for 2x4 table) when expected count < 5 in one or more cells. P-value ≤ 0.05 was considered significant throughout data analysis.

Results

Socio-demographic characters of study samples

Socio-demographic characteristics were seen in Table (1). It revealed 612 (50.1%) of study sample underwent C/S in age groups (21-30) and to lesser extend among age group >41, it was 23 (3.6%) in Al-Batool Teaching Maternity Hospital. Primary educational level was 591(48.4%) among study sample. Nearly two third (62.8%) of participants were urban. Presence of ante natal care commonly seen among attendance to Al-Mosul General Hospital than Al-Batool Teaching Maternity Hospital, (191 (32.5%) vs 120 (18.9%) respectively). Women underwent emergency C/S were 871 (71.3) with one scar 565 (46.3%).

Table 1: Demographic Characters of study sample.

Category	Al-Batool Teaching Maternity Hospital No=(634)		Al-Mosul General Hospital No.=(587)		Total= 1221		P-Value*	
	No.	%	No.	%	No.	%		
Age in Years								
<20	74	11.7	91	15.5	165	13.5	0.000	
21-30	381	60.1	231	39.4	612	50.1		
31-40	156	24.6	202	34.4	358	29.3		
>41	23	3.6	63	10.7	86	7.01		
educational level								
Illiterate	91	14.4	130	22.2	221	18.1	0.000	
Primary	381	60.2	210	35.9	591	48.4		
Secondary	130	20.5	134	22.9	264	21.6		
University and higher education	32	4.9	113	19.0	145	11.9		
Residence								
Urban	396	62.5%	371	63.2%	767	62.8	0.789	
Rural	238	37.5%	216	36.8%	454	37.2		
Presence of Ante natal care								
Yes	120	18.9%	191	32.5%	311	25.5	0.000	
No	514	81.1%	396	67.5%	910	74.5		
Gravidity								
Primigravida	174	27.4%	209	35.6%	383	31.4	0.002	
Multi gravida	460	72.6%	378	64.4%	838	68.6		
Type of C/S								
Elective	115	18.1%	235	40.0%	350	28.7	0.000	
Emergency	519	81.9%	352	60.0%	871	71.3		
Scar								
One scar	269	43.3%	296	50.4%	565	46.3	0.019	
Multiple scar	365	56.7%	291	49.6%	656	53.7		

* Using Z₂ proportion test, significant at ≤ 0.05

Maternal indication of caesarian section

Table (2) describe maternal indication of CS, it revealed that significant differences between two maternity hospitals regarding previous cesarian section, antepartum hemorrhage, maternal request, bad obstetric history and diabetes meletus. The commonest maternal causes of CS in Al-Batool Teaching Maternity Hospital were previous CS 350 (55.3%), failure to progress 135 (21.3%), while in Al-Mosul General Hospital reported failure to progress 127 (21.65%) then cephalopelvic disproportion (15.3%) and previous CS (15.3). Hypertensive disorders in pregnancy 64 (10.1%) frequently seen in Al-Batool Teaching Maternity Hospital while antepartum hemorrhage 37 (6.3%) seen in Al-Mosul General Hospital. P-value not statistically different

Table (2): Maternal cause of Cesarian section

Category	Al-Batool Teaching Maternity Hospital (No. =634)	Al-Mosul General Hospital No.= (587)		Total (No.=1221)		P-value*		95% C.I.**	
	No.	%	No.	%	No.	%			
Cephalopelvic Disproportion									
Yes	102	16.0	90	15.3	192	15.7	0.717	(-0.0332) – - (0.0483)	
No	532	84.0	497	84.7	1029	84.3			
Previous Cesarian section									
Yes	350	55.3	90	15.3	440	36.0	0.000	(0.350) – (0.447)	
No	284	44.7	497	84.7	781	44.0			
Failure to Progress									
Yes	135	21.3	127	21.6	262	21.4	0.887	(-0.0495) – - (0.0426)	
No	499	78.7	460	78.4	959	78.6			
Hypertensive Disorders in Pregnancy									
Yes	64	10.1	45	7.7	109	8.9	0.135	(-0.0075) – (0.0561)	
No	570	89.9	542	92.3	1112	91.1			
Antepartum Hemorrhage									
Yes	24	3.7	37	6.3	61	5.0	0.040	(-0.049) – (-0.0005)	
No	610	96.3	550	93.7	1160	95.0			
IVF baby									
Yes	4	0.6	2	0.3	6	0.5	0.460	(- 0.004) – (- 0.01)	
No	630	99.4	585	99.7	1215	99.5			
Maternal request									
Yes	16	2.5	8	1.3	24	1.9	0.025	(-0.003) – (0.027)	
No	618	97.5	579	98.7	1197	98.1			
Bad Obstetric History									
Yes	48	7.5	130	2.2	178	11.4	0.000	(-0.185) – (-0.106)	
No	586	92.5	457	97.7	1043	88.6			
Renal problem									
Yes	5	0.8	4	0.7	9	0.7	0.826	(-0.008) – (0.010)	
No	629	99.2	583	99.3	1212	99.3			
Diabetes Mellitus									
Yes	15	2.3	55	9.3	70	5.7	0000	(-0.096) – (-0.043)	
No	619	97.7	532	90.7	1151	94.3			
Abnormality in birth canal									
Yes	8	1.2	6	1.0	14	1.1	0.69	(-0.009) – (0.014)	
No	626	98.8	581	99.0	1207	98.9			
Others medical condition***									
Yes	20	3.1	24	4.0	44	3.6	0.384	(-0.030) – (0.011)	
No	614	96.9	563	96.0	1177	96.4			

*Using Z₂ proportion test, significant at ≤ 0.05

** C.I (Confidence Interval)

***Others medical condition includes (heart problem, thrombophlebitis, Asthma, epilepsy, sciatica, cholecystitis, breast carcinoma)

The most common maternal outcomes of CS were seen in Table (3) ICU admission (20.3%), uterine atony (8.3%), need for blood transfusion (8.2) with P- value (0.000). Hysterectomy (0.3% versus 1.2%) and maternal death (0.5% versus 0.9%) were both rare and statistically non significantly between hospitals (p = 0.08 and p = 0.41, respectively).

Maternal out come

Table (3): Distribution of study sample according to Maternal out come

Category	Al-Batool Teaching Maternity Hospital (No. =634)		Al-Mosul General Hospital No.= 587)		Total (No.=1221)		P- Value*		95% C.I.
	No.	%	No.	%	No.	%			
Hemorrhage									
Yes	9	1.4	43	7.4	52	4.2	0.000	(-0.082) - (-0.036)	
No	625	98.6	544	92.6	1169	95.8			
ICU admission									
Yes	181	28.5	66	11.2	247	20.3	0.000	0.129) – (0.216)	
No	453	71.5	521	88.8	974	79.7			
Blood Transfusion									
Yes	27	4.2	73	12.5	100	8.2	0.000	(-0.112) – (-0.050)	
No	607	95.8	514	87.5	1121	91.8			
Surgical Site Infection									
Yes	14	2.3	19	3.2	33	2.8	0.271	(-0.028) – (0.008)	
No	620	97.7	568	96.8	1188	97.2			
Uterine atony									
Yes	22	3.4	81	15.5	103	8.4	0.000	(-0.134) – (-0.071)	
No	622	96.6	496	84.5	1118	91.6			
Hysterectomy									
Yes	2	0.3	7	1.2	9	0.7	0.08**	(-0.018) - (0.001)	
No	632	99.7	580	98.8	1212	99.3			
Maternal death									
Yes	3	0.5	5	0.9	8	0.7	0.418**	(-0.012) - (0.005)	
No	631	99.5	582	99.1	1213	99.3			

*Using Z2 proportion test, significant at ≤ 0.05

**Fisher's exact test used (expected count < 5 in one or more cells)

Table (4) showed that the Mean of score maternal out come a cross both hospitals, although complication steadily higher in the emergency subgroups than in the elective subgroups for hemorrhage(1.015 vs 1.108), blood transfusion (1.046 vs 1.145), uterine atony (1.035 vs 1.205), and hysterectomy (1.004 vs1.014). ICU admission, which is highest in Al-Batool Teaching Maternity Hospital emergency group (29.8%) and is actually higher in its elective group (22.7%) unlike in either subgroup at Al-Mosul General Hospital. In general, the grand mean score for all variable 1.07 not exceed the cut-off point (1.5)

Table (4): Mean score assessment between type of cesarean section and maternal out come.

Category*	Al-Batool Teaching Maternity Hospital (No.=634)				Al-Mosul General Hospital No.= 587)				Total	Over all mean score
	Emergency (No. =519)	Mean of score	Elective (No.= 115)	Mean of score	Emergency (No. = 352)	Mea n of scor e	Elective (No. = 235)	Mean of score		
	No. (%)		No. (%)		No. (%)		No. (%)			
Hemorrhage										
Yes	8 (1.5)	1.015	1(0.8%)	1.009	38 (10.8%)	1.108	5 (2.1%)	1.021	52 (4.2%)	1.043
No	511 (98.5)		114 (99.1%)		314 (89.2%)		230 (97.8%)		1169 (%)	
ICU admission										
Yes	155 (29.8%)	1.299	26(22.7%)	1.226	59 (16.8%)	1.168	7 (3.0%)	1.030	247(20.3%)	1.202
No	364 (70.2%)		89 (77.3%)		293 (83.2%)		228 (97.0%)		974 (79.7%)	
Blood Transfusion										
Yes	24 (4.6%)	1.046	3 (2.7%)	1.026	51 (14.5%)	1.145	22 (9.4%)	1.094	100 (8.2%)	1.082
No	495 (95.4%)		112(97.3%)		301(85.5%)		213 (90.6%)		1121 (91.8%)	
Surgical Site Infection										
Yes	10 (1.9)	1.019	4 (3.5%)	1.035	19 (5.4%)	1.054	0 (0.0%)	1.000	33 (2.8%)	1.027
No	509 (98.1)		111 (96.5%)		333 (94.6%)		235(100.0%)		1188 (97.2%)	
Uterine atony										
Yes	18 (3.4%)	1.035	4 (3.5%)	1.035	72 (20.5%)	1.205	9 (3.8%)	1.038	103 (8.4)	1.084
No	501 (96.6%)		111 (96.5%)		280 (79.5%)		226 (96.2%)		1118 (91.6%)	
Hysterectomy										
Yes	2 (0.3%)	1.004	0 (0.0)	1.000	5 (1.4%)	1.014	2 (0.9%)	1.009	9 (0.7%)	1.007
No	517 (99.7%)		115 (100.0)		347 (98.6%)		233 (99.1%)		1152(99.3)	
Maternal death										
Yes	3 (0.6%)	1.006	0 (0.0)	1.000	2 (0.6%)	1.006	3 (1.3%)	1.013	8 (0.7%)	1.007
No	516 (99.4%)		115 (100.0)		350 (99.4%)		232 (98.7%)		1213 (99.3)	
Over all mean score		1.06		1.047		1.1		1.029		1.07

*Cut-off point 1.5

Association between maternal outcome and certain socio-demographic characters

Association between maternal out-come and age groups was seen in Table (5). Highest maternal complication were seen among women with age group 40 years and more. Hemorrhage (11.6%), Blood Transfusion (14.0%), Surgical Site Infection (4.7%), Uterine atony 15.1%, Hysterectomy (3.5%) and even Maternal death (4.7%) with exception to ICU admission (24.9%) was seen among age groups 31-40 years. In general, there were significant differences between maternal age and their outcome, P-value (0.000).

Table (5): Distribution of the study sample according to maternal out-come and age groups

Maternal Out- come	Age groups in Years								Total (No. = 1221)		P- value*
	<20 (No. =165)		21-30 (No. = 612)		31-40 (No. = 358)		≥41 (No. = 86)				
	No.	%	No.	%	No.	%	No.	%	No.	%	
Hemorrhage	7	4.2%	16	2.6%	19	5.3%	10	11.6%	52	4.2	0.001**
ICU admission	22	13.3%	115	18.8%	89	24.9%	21	24.4%	247	20.3	0.010
Blood Transfusion	12	7.3%	34	5.6%	42	11.7%	12	14.0%	100	8.2	0.001
Surgical Site Infection	7	4.2%	15	2.5%	7	2.0%	4	4.7%	33	2.8	0.299**
Uterine atony	16	9.7%	38	6.2%	36	10.1%	13	15.1%	103	8.4	0.015
Hysterectomy	3	1.8%	0	0.0%	3	0.8%	3	3.5%	9	0.7	0.002**
Maternal death	1	0.6%	2	0.3%	1	0.3%	4	4.7%	8	0.7	0.001**
Total	68	41.10%	220	36.00%	197	55.10%	67	78.00%	552	45.2	0.000

*Using X² test, significant at ≤ 0.05

** using Monte Carlo exact-test

Figure (1) revealed the association of maternal outcome with antenatal care. Absence of antenatal care is associated with a significantly higher rate of nearly every maternal complication. Hemorrhage (7.1%), ICU (23.8%), blood transfusion (11.3%), surgical site infection (4.8), uterine atony (14.5%), and the overall composite complication rate between presence and absence 353 (38.7%), 199 (64.1) respectively with highly statistical significance (p<0.005).

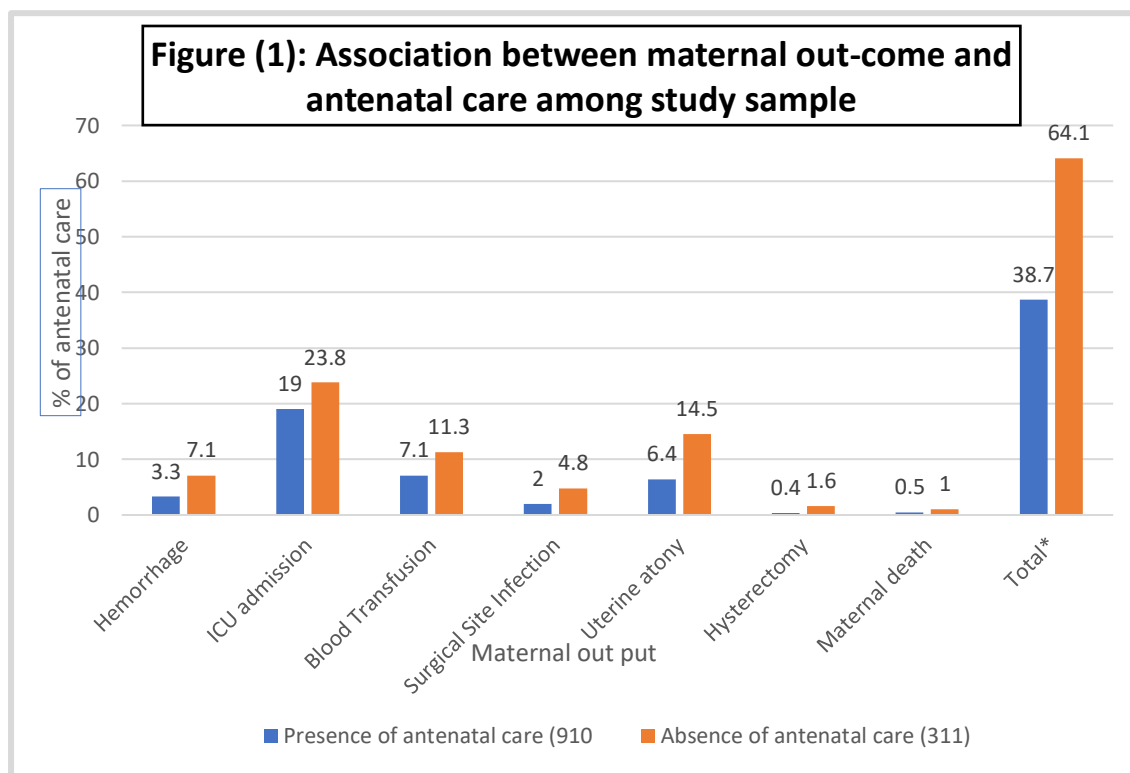
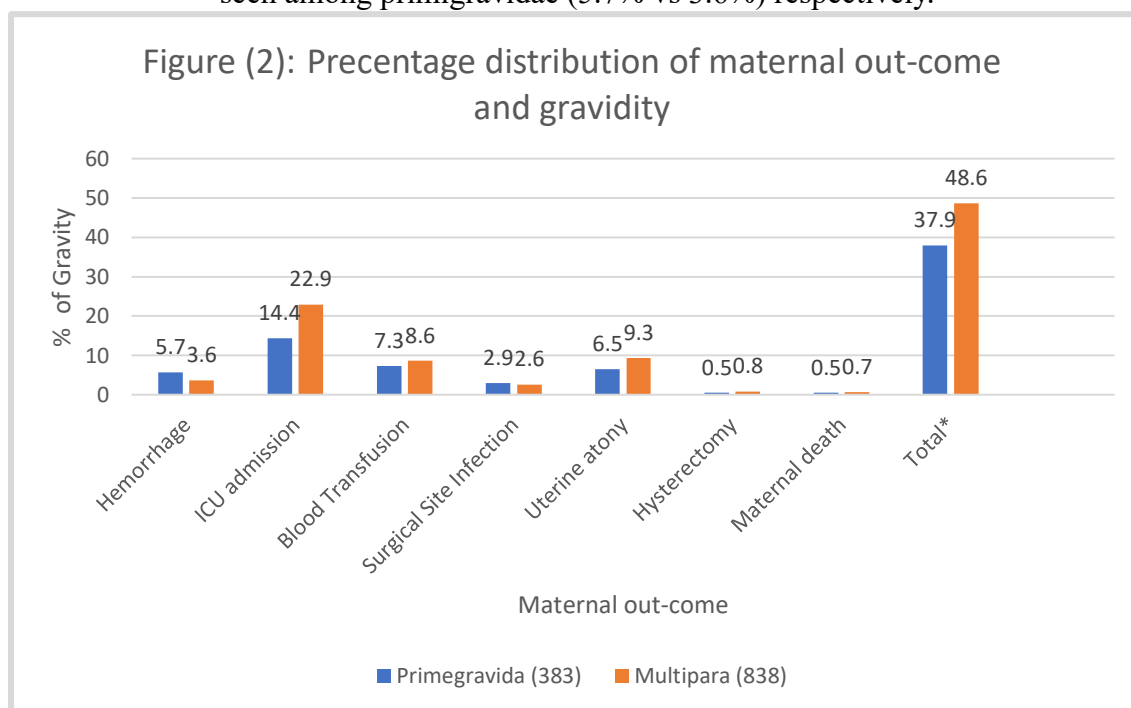


Figure (2) showed a total of 552 of the 1221 women in the study sample (45.3%) had had at least one bad maternal outcome, and this rate this rate was significantly ($P=0.000$) higher among multiparous women (48.6%) than the primigravidae (37.9%). Uterine atony (9.3%), blood transfusion (9.3%) and ICU admission (22.9%) were morbidities seen in the multiparous group. Hemorrhage was recorded as an only outcome which was more frequently seen among primigravidae (5.7% vs 3.6%) respectively.



* Using X^2 test, significant at ≤ 0.05

Discussion

Socio-demography of study sample

The present study done among 1221 mothers underwent CS in two health institutions in Mosul city, Al-Batool Teaching Maternity Hospital which is the center of both Arab and Iraqi specialized center for obstetrics and gynecology and their attendants where from all Ninevah Governorate specially from south-west of Mosul and in maternity department in Al-Mosul General Hospital whose attendants especially from south-east of Mosul.

The present study showed that half of the women who underwent caesarean section were within the 21–30-year age, with only a small percent 86(7.01%) aged above 41 years, findings that are broadly consistent with our community due to socio-culture and/or religious factors that encourage an early marriage and improve their fertility within short period after marriage [16]. A similar finding was seen among married women in childbearing age (1200) study in Mosul, 2008 revealed the prevalence of pregnancy was 20.5%. Half of the pregnant mothers were in youngest age group [17].

The age of becoming pregnant is different in various stages in childbearing age. Women in many developing countries prefer to be pregnant at younger age group to prove their fertility soon after marriage. This may be due to socio-cultural factors encountered in many

communities because the presence of children can provide an emotional benefit to anyone's life [18]. While in developed countries the age of being pregnant is postponed beyond this age for many reasons including securing a suitable job [19]. Nearly half of study sample had primary-level education, together with the significant inter-hospital difference in educational achievement. In Syria, 2025 and China, 2022 in which maternal educational level was closely linked to a different pattern of caesarean utilization than that seen among more educated women, reflecting differences in health-seeking behavior, and awareness of obstetric risk [20,21]. Two-thirds of participants resided in urban areas, and antenatal care attendance differed markedly between the two hospitals. Attending antenatal care depend on the awareness level of women about importance to safe pregnancy outcome, it is linked to the availability of health services in quality and quantity, education level, and socio-culture factor in society. This urban-antenatal care strongest consistent with the broader literature confirming that residence and antenatal care coverage remain among the strongest socio-demographic determinants both the decision for, and the safety of, caesarean delivery [22].

Maternal indication of CS

Previous caesarean section, failure to progress and were after cephalopelvic disproportion the top causes of indications for operative delivery in the present study. A systematic review, 2026 and across sectional study in tertiary center, 2026 found high CS rates, attributed to repeated CS and fetal causes indications [23,24]. The marked inter-hospital disparity in the proportion of women whose operation was indicated by a previous scar is consistent with study in Syria, 2025 revealed that inter -hospital disparity depend on may factors that result in optimizing CS rates for improving maternal and neonatal outcomes (20). A similar finding was seen in Iran, 2007 a retrospective analysis was performed on the obstetric data from 3 hospitals in a 5- year period found that the CS rate at teaching hospital tend to be higher than discrete hospitals as more complicated and prolonged delivery referred to tertiary hospitals was done [25]. Hypertensive disorders of pregnancy (8.9%) and antepartum hemorrhage (5.0%), although less frequent overall, remained clinically important indications in the present sample and are similarly recognized elsewhere as major, potentially preventable, causes of emergency caesarean section that carry a disproportionate share of associated maternal morbidity. Hemorrhage and hypertensive disorder during pregnancy were commonest cause of maternal death in studying trend of maternal mortality in Mosul, 2023 for 5 years period [26]. In the present study there is low frequency of maternal request as an indication for cesarean section (1.9%) suggests that cesarean delivery was predominantly performed for medical or obstetric indications rather than maternal preference. A study from low- and middle-income countries, 2021 showed that nearly similar result where only approximately 2% of cesarean births were attributed to maternal request, while the vast majority were performed for maternal, fetal, or previous cesarean-related indications [27]. Unlike study in Indian's tertiary care hospital over 10 years showed that maternal request CS increased from 3.28% to 11.41% [28].

Maternal out-come of CS

Intensive care unit admission, uterine atony and need for blood transfusion (20.3%, 8.4%, and 8.2%) was the most frequent adverse maternal outcome respectively. A hospital-based reports Ethiopia, 2025 as the predominant cause of poor maternal outcome after caesarean section were hemorrhage, associated medical condition and risk of general anesthesia [29], while study in French tertiary care maternity unit, 2025 is associated with lower rates of severe post-partum hemorrhage and ICU admission among women undergoing trial of labor after cesarean compared with elective repeat cesarean section [30]. Although hysterectomy and maternal death were rare presentations in the present study, their persistence together with the

finding that composite complication scores were consistently higher in the emergency than in the elective subgroup which has consistent with evidence that emergency caesarean section carries a severe maternal morbidity than planned one, largely because it is performed under unplanned condition and often after prolonged labor or acute maternal compromise [30,31]. The study showed that maternal morbidity affected half of the study sample, a proportion exceeding that reported from several comparable institutional studies, reinforces the conclusion that maternal outcome after caesarean section in this setting remained an important indicator requiring continuous audit, particularly regarding blood-loss management and timely increase of care. This finding was consistent with A hospital-based cross-sectional study was conducted in Gebretsadik, Shewa general hospital, 2023 among 382 mothers which was concluded that, the incidence of maternal complication following cesarean delivery was very high [32].

Association between maternal out-come and certain socio-demographic characters

Maternal age showed a clear and statistically significant association with adverse maternal outcome with women aged 40 years and more experiencing the highest rates of hemorrhage, blood transfusion, surgical site infection, uterine atony, hysterectomy and maternal death because of advanced maternal age a risk factor and consider a load of caesarean-related complications by reducing uterine contractility, higher rates of co-morbidity, and greater surgical complexity [20]. Educational level followed a more complex, non-linear pattern in which both illiterate women and those with university and higher education level, showed elevated complication rates relative to women with intermediate schooling. A U-shaped distribution that has also been described in other socio-demographic analyses of caesarean morbidity, and that may reflect differing pathways to poor outcome: young age women with/ or inadequate antenatal care among the least educated versus older age, multipara, or request-driven pregnancies among the most educated [27,28]. The strong association was seen between absence of antenatal care and multipara regarding every measured complication, is consistent with recent evidence identifying lack of antenatal follow-up as one of the most powerful and modifiable predictors of poor maternal outcome after caesarean delivery, underscoring antenatal care coverage as a priority target for intervention [33].

Conclusions

The commonest maternal outcomes were admission to ICU, uterine atony and blood transfusion. Although Mean score assessment of maternal out come and type of cesarean section not reach cut-off point but its presence frequently associated with multipara, women aged more than 40, illiterate and those with absence of antenatal care that required adequate and frequent assessment during pregnancy with insurances of the continuous availability of blood products, uterotonic agents, and intensive care beds at both maternity hospitals to improve maternal outcome.

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Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this manuscript.

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