

Maternity Dash Board's Contribution to Better Maternal Health Outcomes

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Abstract

Background: In a labor and delivery facility, clinical maternity conditions can change quickly, which can result in unanticipated morbidities for both the mother and the baby. One important way to assess the quality and accessibility of a labor and delivery unit is to look at the rates of normal vaginal deliveries (NVDs) and cesarean sections (CS). These metrics are presented in the maternity dash board (MDB), as it firstly implemented in the Obstetric and Gynaecologic Teaching Hospital in Karbala. **Patients and Methods:** Research data were collected from the medical records of a labor and delivery unit manually and put in the MDB program, which was newly implemented in that hospital in 2023. The data were collected from the January 1st to December 31, also used data from last year before implementing the program, and then compared the data before and after the installation of MDB. **Results:** As the result of our study, the total NVD rate was 66% and 68% before and after implementation, respectively, indicating a significant increase in NVD ($P < 0.0024$), and the CS rate was 33% and 31% before and after implementation, respectively, indicating a significant reduction in the CS rate ($P < 0.0001$) after the implementation of the MDB. **Conclusion:** There is a significant reduction in the CS rate after the implementation of the MDB.

Keywords: Cesarean sections, maternal health outcomes, maternity dash board, normal vaginal delivery

INTRODUCTION

There is a global effort to enhance perinatal and maternal health. However, quality assessment is necessary for quality improvement.^[1] According to a worldwide review, the first 24 h after birth account for nearly half of all maternal fatalities and one-third of all newborn deaths. Many intrapartum maternal-fetal fatalities have been caused by delayed diagnosis and delayed beginning of appropriate therapy. To prevent delays in diagnosing and treating obstetrical difficulties, hospital labor, and delivery units are urged to implement the maternal indicators as in maternity dash board (MDB).^[2]

Clinical practice and results in places providing care for mothers and newborns vary widely throughout Iraq, indicating the need for improvement. Audit and feedback are an extensively utilized strategy to support evidence-based treatment in clinical settings.^[3] This method gives users feedback on their practices, and clinical performance is evaluated over time. These are among the most widely utilized

knowledge translation therapies because they work well in a variety of therapeutic contexts.^[4]

After a thorough research process, 5 clinical performance concerns related to pregnancy outcomes were chosen and polished for the Dashboard. These performance metrics were selected in part due to their clinical significance for patient outcomes, meaning that improvements in these metrics might result in significant public health gains.^[5] MDB gave users feedback relevant to the hospital in almost real time, together with peer comparison data and a visual representation of practice gaps and standards to guide practice changes.^[3] The objective of our study was to evaluate the effect

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of the implementation of the Dashboard on the rates of 5 clinical performance indicators in maternal-newborn care across obstetrics and gynecology teaching hospitals.

PATIENTS AND METHODS

Our study population included all hospital deliveries taking place in the Obstetric and Gynaecologic Teaching Hospital in Karbala, encompassing live births weighing ≥ 500 g between January 1 and December 31, 2023, with additional data collected from the preceding year, including 3 quality indicators (normal vaginal delivery [NVD], cesarean rate, special operation), cesarean section (CS) rate is a key indicator of the accessibility and quality of a labor and delivery unit evaluation of data quality in both datasets demonstrates an overall high level of quality, with comparable standards observed between the two sets. The Dashboard audit and feedback intervention to allow for increased

awareness and uptake of the Dashboard. **Goals** were set for each of these, along with upper and lower thresholds. The traffic light approach was used to grade performance. Parameters in “green” were considered as a gold standard, and “amber” and “red” parameters depicted areas of weakness and warranted immediate corrective measures. All the parameters that were analyzed were noted on the dashboard as shown in Table 1.

At various time intervals (monthly), trends were assessed both pre- and post-intervention. A comparison was made between the preintervention trend and the postintervention trend to ascertain the impact of the intervention concerning the underlying secular trend.

Ethics approval

This study was approved by the ethical committee of Department of Family and Community Medicine, Medical College, Al-Mustansiriyah University, Baghdad, Iraq, on 3th June 2023.

To ensure adherence to ethical guidelines, several measures were adopted while conducting this study:

1. No incentives were offered to the participants in return for their participation.
2. Verbal consent was obtained from the participants before filling the questionnaire.
3. Participants were informed that their participation in this study is voluntary, no incentives or compensations will be offered in return, and that they have the right to withdraw from the study at any stage. The scientific value of their participation was explained in the verbal consent.
4. The contact information of the principal investigators was provided for participants.
5. All the participants' information was kept private by keeping it in a secured folder in a password-protected computer owned by the study investigators. No information was shared with any other individuals or entities.

RESULTS

Trends in normal vaginal delivery rate

From January 1, 2023, to December 31, 2023, a total of 15850 women deliver occurred at the study hospital, 10844 (68%) of those were NVD. The overall NVD rate, showed an upward trend after the implementation of MDB, compared to the NVD rate demonstrated before MDB implementation (66%) with a highly significant difference ($P = 0.0024$) as shown in Figure 1.

Trends in cesarean delivery rate

From January 1, 2023, to December 31, 2023, a total of 15,850 women delivered occurred at the study hospital, 4866 (31%) of those were CS. The overall CS rate, showed a downward trend after the implementation of MDB, compared to the CS rate demonstrated before MDB implementation (33%) with a highly significant difference ($P = 0.0001$) as shown in Figure 2.

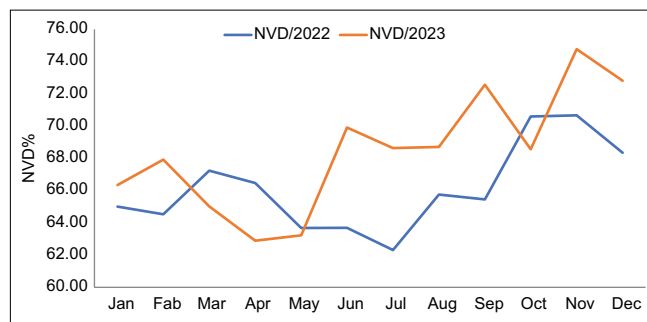


Figure 1: The trend of normal vaginal delivery rate through 12 months in 2022 and 2023. NVD: Normal vaginal delivery

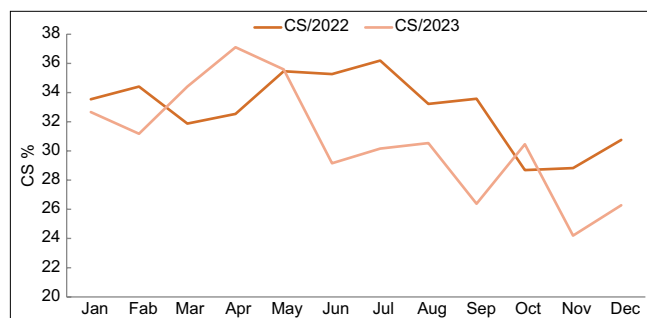


Figure 2: The trend of cesarean section rate through 12 months in 2022 and 2023. CS: cesarean section

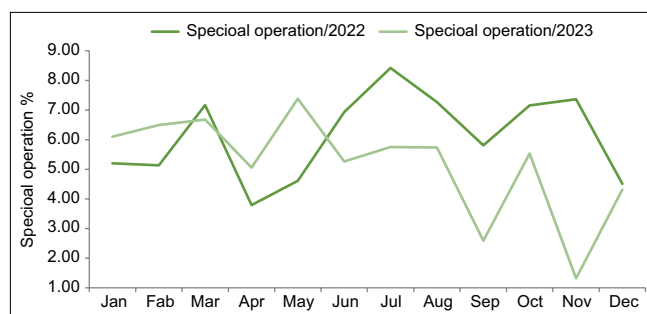


Figure 3: The trend of special operation rate through 12 months in 2022 and 2023

Table 1: The impact of the intervention concerning the underlying secular trend

Activities	International incidence	Goal	Red	Yellow	Green	Maternity Dashboard											
						Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1 Total deliveries			>1350/month	1350-1300/month	<1300/month	1506	1334	1392	1226	1256	1173	1326	1313	1319	1425	1256	1324
2 OPD appointment		<4000/month	>5000	5000-4000	<4000	7031	6100	2967	2304	6218	6129	5938	5950	3640	3700	2311	5942
3 Total NVD	0.99	>90 %	<75 %	75-85 %	>85 %	66%	68%	65%	63%	63%	70%	69%	69%	73%	69%	75%	73%
4 Total CS	18.60% %	<20 %	>30%	20-30 %	<20 %	33%	31%	34%	37%	36%	29%	30%	31%	26%	30%	24%	26%
Maternity																	
1 Midwife/patient ratio		50.00%	25.00%	33%	50%	1%	2%	1%	1%	2%	2%	2%	2%	2%	1%	2%	2%
2 Specialist/midwife ratio		90%	<80 %	90%-80 %	>90%	86%	86%	90%	89%	79%	81%	90%	80%	81%	90%	95%	81%
2 Episiotomy	10%	20%	>30%	30-25%	<25%	33%	24%	24%	40%	35%	23%	19%	18%	31%	34%	26%	36%
3 Third & Fourth-degree tear	0-8%(RCOG), 5/month UK	<3/month	>7/month	7-4/month	<4/month	0	2	6	0	3	2	0	2	2	2	2	1
4 PPH	0.3-1.8 %	<10/month	>30/month	30-20/month	<20/month	30	40	36	39	43	30	35	46	34	48	19	40
5 ICU admission	<1 %	<3/month	>7/month	7-4 /month	<4/month	0	0	0	0	0	0	0	0	0	0	0	0
6 Postpartum hysterectomy	0.2-8.7/1000	2/year	4/year	3/year	<2/year	0	0	0	0	0	0	0	0	0	0	0	0
7 Maternal death	<70/100000, <1 %	1/year	>2%	2%-1%	<1%	0	0	0	1	0	1	0	0	0	0	0	0
Neonatal outcomes																	
1 <7 Apgar score at 5m	7/1000	<3 /month	>4/month	3-4/month	<4/month	2	0	0	0	0	0	0	0	0	0	0	0
2 Meconium aspiration	0.7-5%/1000	2/month	5/month	4/month	3/month	2	1	0	0	0	1	0	0	0	1	1	0
3 Birth asphyxia	1-2/1000	4 /month	>10/month	10-6 /month	<6/month	5	7	8	7	10	3	8	11	12	10	13	3
4 Stillbirth	3-5/1000	10 /month	>15/month	15-11/month	<11/month	15	12	8	8	15	11	16	10	14	14	13	12
5 END	<12/1000	10/month	>12 /month	12-10/month	<10/month	12	9	8	14	6	9	7	6	15	10	4	6
NICU	<18/1000	25/month	>50/month	50-30/month	<30/month	77	74	82	97	97	60	69	74	62	69	36	52
6 Birth weight <2500 g	14.7%, 14-15/1000	30/month	>40/month	40-35/month	<35/month	45	42	53	50	69	79	21	19	29	27	16	17

Trends in special operation rate

From January 1, 2023, to December 31, 2023, a total of 4866 women delivered by CS occurred at the study hospital, 261 (5%) of those were special operations. The overall special operation rate, showed a downward trend after the implementation of MDB, compared to the special operation rate demonstrated before MDB implementation (6%) with significant deference ($P = 0.0131$) as shown in Figure 3.

DISCUSSION

According to the study's findings, the introduction of MDB significantly reduced the CS rate, increased the rate of NVD in pregnancies, and improved the CS rate overall. Although there was no significant difference in perinatal outcomes between the preintervention and postintervention periods, pregnant women experienced an increase in the average duration from admission to birth following the MDB's introduction. CS is currently the most common surgical treatment performed on women. It is a vital technique that saves the lives of mothers and fetuses when natural vaginal birth is no longer the safest alternative.^[6] However, from the standpoint of public health, doing CSs for low-risk pregnancies puts moms and fetuses at greater risk for both short- and long-term health problems.^[7-9] As a result, the CS rate throughout pregnancies is regarded as a crucial obstetric care quality indicator.^[10] The results of the present study are consistent with those of other studies.

CONCLUSION

Results indicating that increasing the adherence of healthcare workers to the criteria for the arrest of labor significantly reduced the rate of CS delivery and increased the rate of NVD after MDB intervention was implemented in the labor and delivery unit of a maternity hospital in Karbala.

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Conflicts of interest

There are no conflicts of interest.

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