Effects of World Health Organization Labour Care Guide Utilization for Safe Motherhood during Intrapartum Period through Midwives

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ABSTRACT

Background: The World Health Organization's (WHO) Labour Care Guide (LCG) is a critical document designed to advance maternal and newborn outcomes in the course of Labour. It is vital to uphold high-quality intrapartum care that responds to international global health standards.

Objective: Effects of the WHO LCG by midwives to promote safe motherhood during the intrapartum period.

Methodology: This multi-centered quasi-experimental study includes data from 216 delivery cases, collected through 43 midwives who fulfilled the inclusion criteria, i.e., minimum 2 years of job experience and running an independent maternity clinic, using the WHO LCG. 43 midwives from 15 centers in Quetta, Pakistan, were selected to assess their competency level after training about the WHO LCG. Descriptive statistics were applied for the competency level of midwives, a chi-square test was used to compare the safe motherhood outcome pre- and post-implementation of WHO LCG. $p < 0.05$ was considered significant.

Results: The mean competency level score of midwives was 93.1 ± 3.6 percent, which is excellent. The maternal health care outcomes pre and post implementation of LCG guideline improved significantly except obstructed Labour (p=0.068) and uterine rupture (p= 0.082), which improved insignificantly, with pre-training occurrence of 12 (5.6%) and 3 (1.4%) cases, respectively. Neonatal outcomes also show significant improvement except stillbirth cases (p=0.082), which improve insignificantly with pre-implementation of LCG, occurring cases of 3 (1.4%).

Conclusion: WHO LCG has a significant effect on maternal and neonatal health care. Moreover, the competency level of midwives was also improved after training

Keywords: *Intrapartum period, Midwives, Safe motherhood, World Health Organization Labour Care Guide*

1. INTRODUCTION

The World Health Organization (WHO) Labour Care Guide (LCG) is a tool designed to improve intrapartum care by graphically tracing childbirth progress, replacing the WHO modified partograph.(1) It aids in the early detection of maternal as well as foetal risks, such as eclampsia, obstructed Labour, and foetal distress, allowing timely interventions with colLabourative decision-making.(2, 3) In Asia, Balochistan has the highest maternal mortality rate. In Pakistan, the maternal mortality rate is 186 per 100,000 live births, with disparities between provinces; Balochistan has the highest MMR of 298 per 100,000 live births.(4) Nevertheless, Balochistan is among the poor and largely ignored states of Pakistan. In addition to 63 deaths per 1,000 live births, it has a high neonatal mortality rate.(5) Worldwide Labour and intrapartum complications, including postpartum bleeding and foetal distress, are the main causes of maternal and neonatal deaths.(6) In addition to complications during Labour, such as preterm Labour, asphyxia, and hypoxia, they increase the risk of neonatal morbidity and mortality.(5) The mother and the baby can be harmed if preventable complications are not prevented during Labour. A failure to use essential tools and expertise during Labour may result in negative outcomes for both developed and developing

nations.(7) Although the partograph is a cost-effective tool, it is often misused in Labour wards and contributes to one in ten maternal deaths and 2.5 million newborn deaths annually.(8) A study linked poor Labour monitoring to inadequate partograph documentation resulting from staff shortages, knowledge gaps, and skills deficiencies.(7)

SDG #3 objectives to reduce maternal mortality to <70 per 100,000 live births also infant mortality to 12 per 1,000 by 2030.(9, 10) It is essential to practice the partograph to monitor Labour as well as contribute to achieving Sustainable Development Goal 3.(7) A mixed method research confirms that the WHO Labour Care Guide (LCG) facilitates prompt detection of complications like obstructed Labour, eclampsia, chorioamnionitis, and foetal distress, thus ensuring positive birth outcomes. Its effectiveness lies in six key components: supportive care, foetal and maternal well-being, Labour progress, medication, and shared decision-making.(3) The WHO LCG promotes safer outcomes by facilitating early diagnosis, timely treatment, and effective referrals.(11)

Propose a new partograph to improve safe motherhood and perinatal outcomes in India, showing shorter Labour, fewer vaginal exams, and higher Apgar scores.(12) Piloted the WHO LCG in four Indian hospitals to assess its impact on caesarean rates. LCG reduced caesarean rates by 5.5% (from 45.2% to 39.7%) among 26,331 participants in Robson Group 1. Oxytocin augmentation also decreased by 18%, with other outcomes remaining similar.(13)

Continuous foetal monitoring using the LCG, including heart rate, amniotic fluid, and skull molding, helps detect foetal distress. Increased heart rate, prolonged bradycardia, meconium in the amniotic fluid, or reduced/absent fluid may indicate oxygen deficiency (hypoxia).(14) The evidence proved that midwives, as experts in Labour care, must be skilled in using tools like the partograph to manage Labour effectively and decrease maternal and perinatal complications.(2) Another study found that midwives' use of the LCG improves with proper training, support, and resources, while lack of training, motivation, and supervision leads to incomplete or non-use.(15) Additionally, The LCG supports professional decision-making which is critical-thinking directed, patient-centered, and needs-based specific in monitoring.(11, 13).

Significance of the Study

Significance of The Study: Balochistan has the highest maternal-neonatal rate in Asia and is one of the poorest and neglected regions. The application of the WHO Labour Care Guide is an inexpensive and effective standard monitoring graph that is extremely helpful to midwives and safe motherhood during the intrapartum period.

Application of the WHO LCG increases midwives' skill and confidence in documentation and decision-making to the advantage of maternal and neonatal health. minimizing unnecessary interventions and reducing the risks of mortality. To attain Sustainable Development Goals 3.1 and 3.2 by 2030, which involve a decline in maternal and newborn deaths. In this study, the guide's effect on newborn health will be evaluated through the assessment of referrals and interventions timing in emergency obstetric care, which will provide useful insights for healthcare practice in Quetta, Balochistan

2. MATERIALS AND METHODS

This quasi-experimental study was conducted at 15 maternity clinics in four areas, Pashtoon Abad, Ispini, Faiza Abad, and Bewery Road in Quetta, Balochistan. This study was conducted from February 2024 to October 2024 following the approval of synopsis from the Research Ethical Committee (REC), FAHS-UOL. This research approach involves examining a single group (n= 43 midwives)[17] both before and after an intervention. Practicing midwives with more than two years of work experience and running an independent maternity clinic were included. Unlike a true experimental design, it does not include a control group, random assignment, or manipulation of an independent variable. Instead, the researcher observes and measures the outcomes within the same group at two points: before and following the intervention by using a purposive sampling technique. This study utilized the WHO LCG to evaluate the plotting competency of midwives and safe motherhood during the intrapartum period.(16)

In assessing maternal health outcomes, it is essential to identify prolonged labour, evaluate obstructed labour, monitor for postpartum hemorrhage, detect uterine rupture, and record any maternal deaths to guide timely interventions. For neonatal health outcomes, thorough documentation of whether a baby is born alive or dead is critical. Additionally, evaluating birth asphyxia at both 1-minute and 5-minute intervals and counting cases of stillbirth (death soon after birth) provides insight into newborn health status. In tracking emergency obstetric services, tabulating the number of emergency procedures, such as C-sections, and measuring the timeliness of referrals and interventions are vital for assessing response efficiency and improving maternal and neonatal care outcomes.

Safe motherhood outcomes refer to ensuring that women receive the necessary care and support before, during, and after childbirth to ensure their health and well-being, reducing the risk of maternal mortality and morbidity. The outcome of labour is assessed through four items, with a total of 6 points. Poor safe motherhood outcome score was 0-4 and good safe motherhood outcome score was 5-6.(17).

Likewise, midwives' competency ensures adherence to the guidelines, midwives must be able to interpret, complete, and record the WHO Labour Care Guide (LCG) findings accurately during intrapartum care. A checklist was used to measure

midwives' documentation competency. Poor score was considered as 60 - 69% whereas, good score was considered as >70%.(17)

Demographic data, such as age groups, marital statuses, work in different shifts, and work experiences of midwives were collected through the demographic form and the WHO LCG checklist assessment adopted by Mabasa for midwives' documentation competency and safe motherhood outcomes.(17)

Before the pre-assessment, consent was obtained from midwives, and a demographic data tool was used to collect necessary background information. In the pre-intervention phase, maternal outcome data were retrieved from maternity clinic records.

41 midwives were split into four groups, each group including 10 to 12 midwives, during the 16-week intervention phase. Four days a week, starting Monday to Thursday, training sessions were provided. Emphasizing how it could benefit outcomes for mothers and infants, the WHO LCG was introduced in Sessions 1 and 2 to midwives. Midwives received an LCG, a WHO Labour Care Guide User Manual, and a PowerPoint presentation to help them use hospital resources wisely. The fourth session emphasized the practical application of the WHO LCG with real world cases. Session five concentrated on putting the WHO LCG into effect in medical setting as well as adjusting it. The 4hour session sought to guarantee standardized usage of the LCG, monitor results, adjust approaches depending on feedback, excel in treatment and results, incorporate it into current protocols, and effectively use the LCG. Every maternity clinic guaranteed access to the WHO LCG and its user manual guidance.

SPSS version 23 allowed for data analysis. Regarding the competency level of midwifery, the information was presented in frequency/percentage calculated using demographic variables like age, marital status, and employment experience. A chi-square test was used to analyze qualitative data on safe motherhood results before and after the WHO LCG was introduced. Since the data was not normally distributed, a nonparametric Mann-Whitney U test was used for ranking quantitative information, including knowledge level score before and after the WHO LCG was introduced. $p < 0.05$ was judged statistically relevant.

3. RESULTS

1. Demographic characteristics

Among the midwives, 39.5% were aged 23–26 years, 23.3% were 27–30 years, 18.6% were 31–34 years, 14% were 35–38 years, and 4.7% were 39–42 years. Most had 4–6 years of work experience (37.2%), with 23.3% having 1–3 years and 2.3% having 16–18 years. Regarding marital status, 53.2% were unmarried, 37.2% married, 7% widowed, and 2.3% divorced. In terms of shifts, 44.2% worked mornings and 27.9% worked nights (Table 1).

2. WHO LCG documentation Competency of midwives

The study found that all 43 midwives achieved competency scores above 70% across 216 cases post-WHO LCG training, with 98.1% of labour outcomes rated as good (Table 2). Figure 3 shows mean scores for midwives' competency in seven WHO LCG sections. Supportive care scores were 3.78 ± 0.45, 3.96 ± 0.21, and 3.94 ± 0.26, while foetal condition scores were 5.82 ± 0.44, 5.96 ± 0.19, and 1.98 ± 0.15. Total scores were 27.17 ± 0.91 (initial), 20.74 ± 0.52 (subsequent), and 11.81 ± 0.44 (second stage).

3 Safe motherhood outcomes

Before implementing the guidelines, Assisted Vaginal Deliveries (AVDs) were 1.4% (3 cases), and C-sections were 5.6% (12 cases). Post-implementation, AVDs increased to 2.3% (5 cases), and C-sections decreased to 1.4% (3 cases), showing a significant difference (p=0.05). Prolonged labour cases decreased from 12.5% (27 cases) to 3.7% (8 cases) (p=0.001). Obstructed labour decreased from 5.6% (12 cases) to 2.3% (5 cases) (p=0.068). Postpartum hemorrhage decreased from 23.6% (51 cases) to 10.2% (22 cases) (p<0.001). Uterine rupture dropped from 1.4% (3 cases) to 0% (p=0.082), and maternal deaths decreased from 2.8% (6 cases) to 0% (p=0.014).

For neonatal outcomes, live births increased from 96.8% (209 cases) to 99.5% (215 cases) (p=0.032). Baby deaths reduced from 3.7% (8 cases) to 0.5% (1 case) (p=0.06), and stillbirths decreased from 1.4% (3 cases) to 0% (p=0.082). Birth asphyxia was recorded in 95.4% (206 cases) of neonates, with a significant difference (p<0.001). Referrals decreased from 6% (13 cases) to 1.9% (4 cases) (p=0.026). Interventions increased from 4.2% (9 cases) to 95.8% (207 cases) (p<0.001), and emergency C-sections dropped from 6% (13 cases) to 1.4% (3 cases) (p=0.011).

Result Tables

Table 1: Demographic: Variables of Midwives

	Frequency (f)	Percentage (%)

Age in years	23 to 26	17	39.5
	27 to 30	10	23.3
	31 to 34	8	18.6
	35 to 38	6	14.0
	39 to 42	2	4.7
Work Experience Years	1 to 3	10	23.3
	4 to 6	16	37.2
	7 to 9	9	20.9
	10 to 12	4	9.3
	13 to 15	3	7.0
	16 to 18	1	2.3
Marital Status	Divorce	1	2.3
	Married	16	37.2
	Unmarried	23	53.5
	Widow	3	7
Working Shift	Morning	12	27.9
	Evening	19	44.2
	Night	12	27.9

Table 2: WHO LCG documentation Competency level and safe motherhood outcome of midwives' post intervention

Grade

		Frequency(f)	Percentage (%)
Competency Level	Good (>70%)	216	100
Safe motherhood Outcomes	Good (5-6)	212	98.1
	Poor (0-4)	4	1.9

Table 3: Comparison of safe motherhood outcomes before and after implementation of LCG

		Group		P value
		Pre-Implementation of WHO LCG	Post-Implementation of WHO LCG	
Mode of Delivery	AVD	3 (1.40%)	5 (2.30%)	0.05
	C/S	12 (5.60%)	3 (1.40%)	
	NVD	201 (93.10%)	208 (96.30%)	
Prolonged Labour	no	189 (87.50%)	208 (96.30%)	0.001
	yes	27 (12.50%)	8 (3.70%)	
Obstructed labour	No	204 (94.40%)	211 (97.70%)	0.068
	yes	12 (5.60%)	5 (2.30%)	

| Postpartum Haemorrhage	no	165 (76.40%)	194 (89.80%)	<0.001
	yes	51 (23.60%)	22 (10.20%)	
Uterine Rupture	no	213 (98.60%)	216 (100.00%)	0.082
	yes	3 (1.40%)	0 (0.00%)	
Maternal Death	no	210 (97.20%)	216 (100.00%)	0.014
	yes	6 (2.80%)	0 (0.00%)	

Table 4: Comparison of safe motherhood outcomes (neonatal outcomes) before and after implementation of LCG

		Group				Total		P value
		Pre-Implementation of WHO LCG		Post-Implementation of WHO LCG				
Baby Alive	no	7	3.20%	1	0.50%	8	1.90%	0.032
	yes	209	96.80%	215	99.50%	424	98.10%	
Baby Death	no	208	96.30%	215	99.50%	423	97.90%	0.06
	yes	8	3.70%	1	0.50%	9	2.10%	
Still Birth	no	213	98.60%	216	100.00%	429	99.30%	0.082
	yes	3	1.40%	0	0.00%	3	0.70%	
Birth Asphyxia	no	0	0.00%	206	95.40%	206	47.70%	<0.001
	no record	216	100.00%	0	0.00%	216	50.00%	
	yes	0	0.00%	10	4.60%	10	2.30%	

Table 5: Comparison of safe mother outcome (Services) before and after implementation of WHO LCG

		Group				Total		P value
		Pre-Implementation of WHO LCG		Post-Implementation of WHO LCG				
Number of Referral	No	203	94.00%	212	98.10%	415	96.10%	0.026
	yes	13	6.00%	4	1.90%	17	3.90%	
Number of Intervention	no	207	95.80%	9	4.20%	216	50.00%	<0.001
	yes	9	4.20%	207	95.80%	216	50.00%	
Emergency C/Section	no	203	94.00%	213	98.60%	416	96.30%	0.011
	yes	13	6.00%	3	1.40%	16	3.70%	

Figures
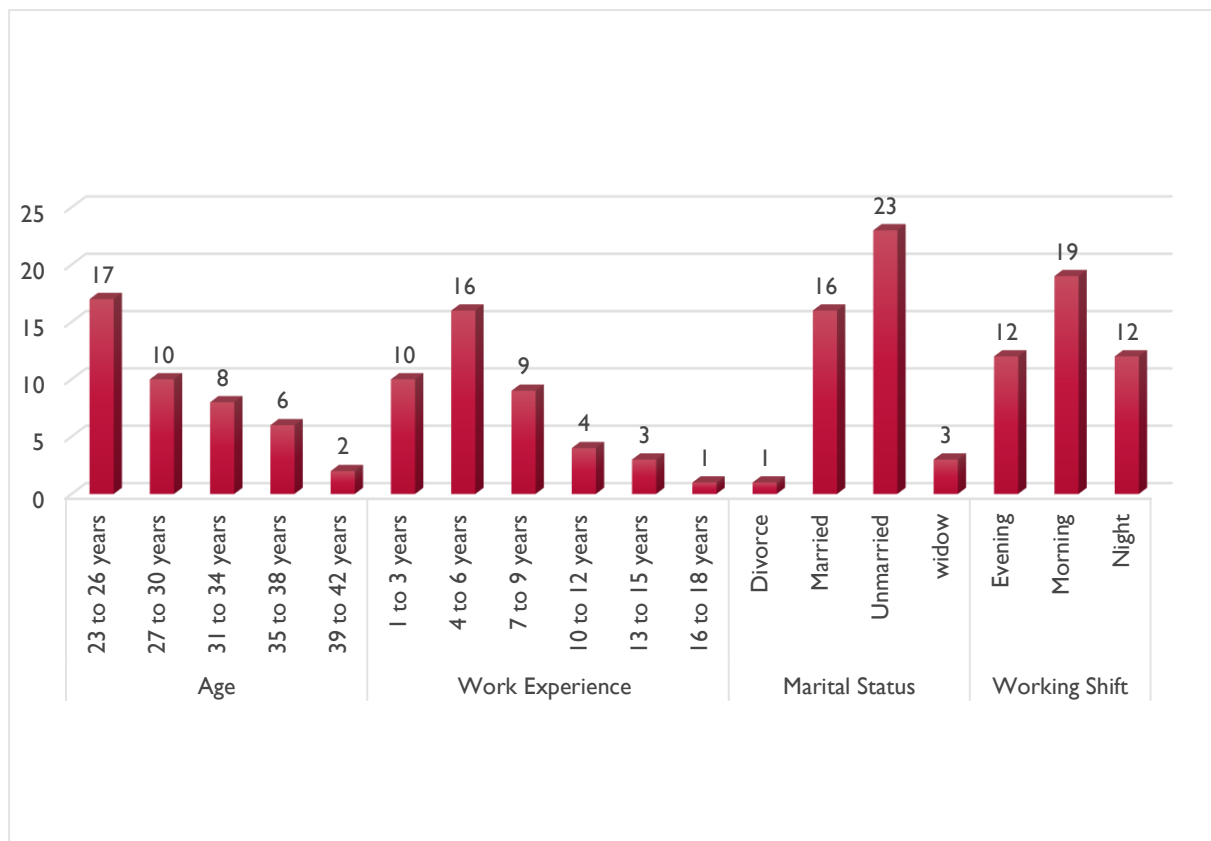
Figure 1: Bar Chart of Demographic data of Midwives
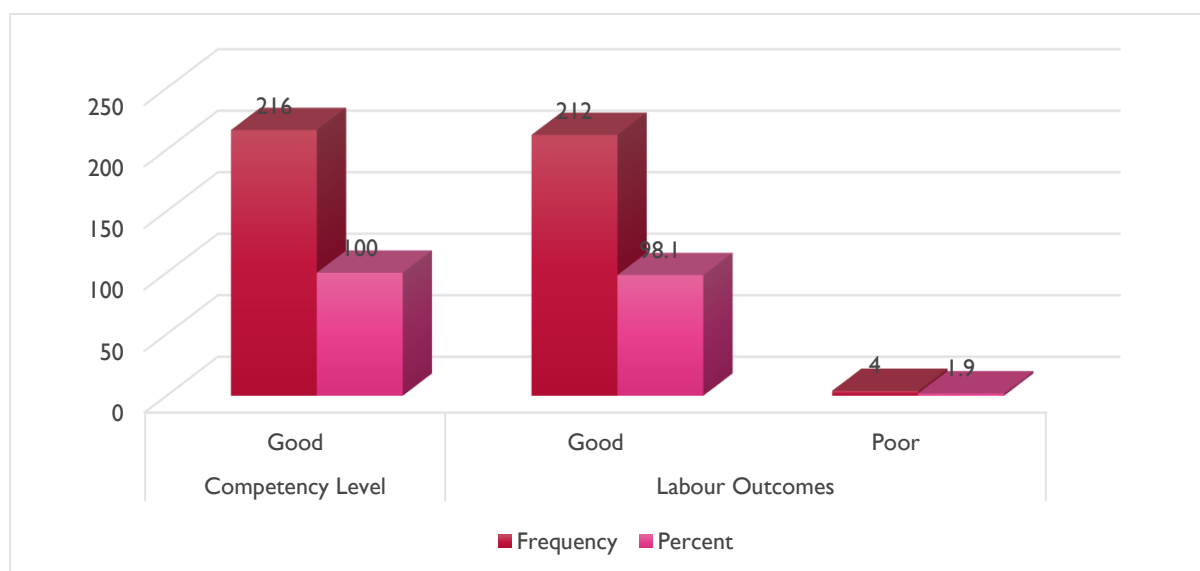
Figure 2: Bar chart of frequency / percentage of grading of competency level of midwives and safe motherhood outcome

Figure 3: Bar chart of Competency level score of midwives on the basis of WHO LCG checklist's sections
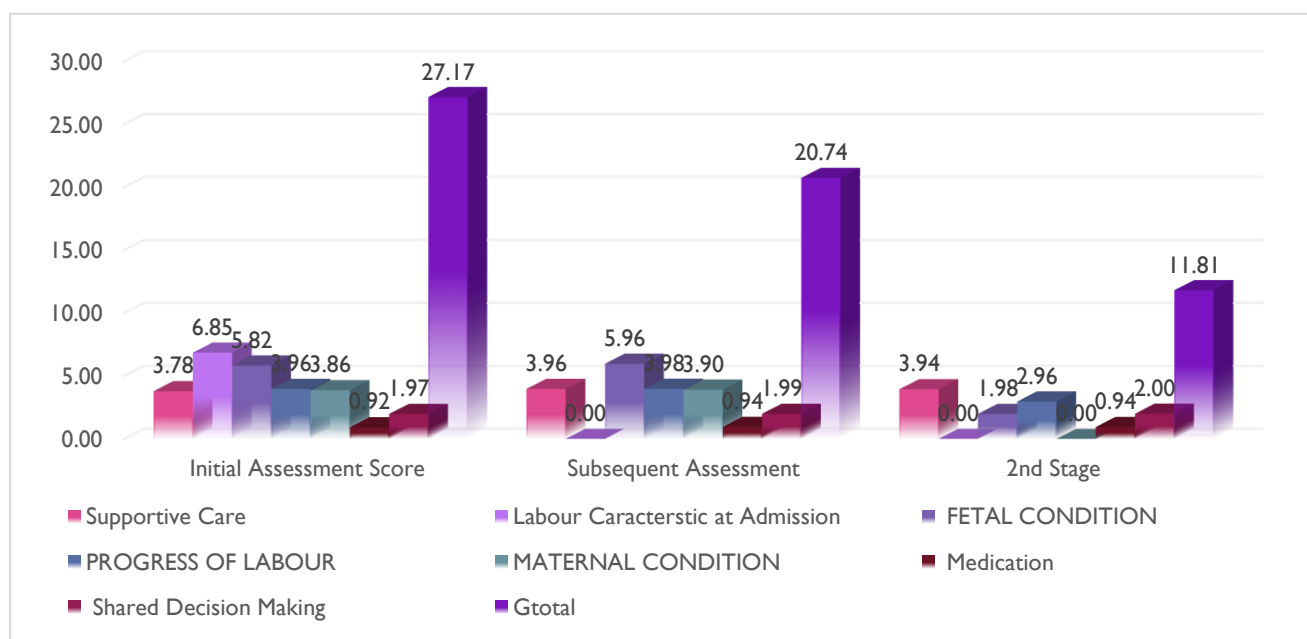
4. DISCUSSION

Demographic characteristics of midwives

Among the midwives, 39.5% were aged 23–26 years, 23.3% were 27–30 years, 18.6% were 31–34 years, 14% were 35–38 years and 4.7% were 39–42 years. Most who had 4–6 years of work experience (37.2%) with 23.3% having 1–3 years and 2.3% having 16–18 years. Regarding marital status, 53.2% were unmarried, 37.2% married, 7% widowed, and 2.3% divorced. During a descriptive cross-sectional study conducted in Zimbabwe, it was found that 70% of midwives (n = 35) were aged 31–40, and 60% (n = 30) were married. Additionally, 80% (n = 40) had two to four years of work experience. In the current study, the findings highlight similarities and differences in the demographic characteristics of midwives.(7)

WHO LCG documentation competency of midwives

With 15 centers in Quetta, Pakistan and 43 midwives, this analysis determined that the mean overall score of the competency level of midwives noted using the WHO LCG checklist was 93.1 percent ± 3.6. Based on the LCG checklist records management, all forty-three midwives were rated as excellent. Recorded minimum score: 75.4 percent. Furthermore, they were rated highly by the Labour outcomes section since their average score of 6 ± 0.31 was among the best. Four of the forty-three midwives were graded as bad only. Likewise, a review to establish the WHO LCG's usability, popularity, and practicality yielded great satisfaction when it came to monitoring women in Labour. Midwives discovered the LCG to be an efficient instrument that increased accuracy of documentation, encouraged critical thinking, and made them more sensitive to women's requirements. Moreover, it made clinical handover easier and professionals said they had a good change in their experiences, thus raising practice quality.(1)

WHO LCG's impact on maternal and neonatal health

Proper use of the WHO LabourCare Guide (LCG) guarantees timely decision-making and minimizes unnecessary interventions, thus improving maternal and neonatal outcomes, as this research shows. Good monitoring and recording via the LCG during the intrapartum phase increase therapeutic control, therefore stressing the need for safe motherhood. Furthermore, Mugyeny et al. found that LCG use helps to identify protracted and obstructed Labour as well as affect obstetric interventions, Labour monitoring, neonatal outcomes, and maternal complications including postpartum heamorrhage, sepsis, and death. Moreover, research indicates that it enhances clinical judgment and reduces adverse maternal and neonatal outcomes. These findings clearly show that systematic Labour checking improves intrapartum care. (11)

Frequency / Percentage of Mode of Delivery

Before implementation, there were 3 (1.4%) Assisted Vaginal Birth (AVD) and 12 (5.6%) C-sections. After implementation, AVD increased to 5 (2.3%) and C-sections decreased to 3 (1.4%) (table 6). According to the study, 84.4% of AVDs and 68.7% of CSs were caused by prolonged second-stage Labour, furthermore, Feto-maternal complications during the second

stage of Labourmust be addressed.(18) As published by Vogel et al, the effect of LCG on the cesarean section rate showed that the primary outcome, the cesarean rate, was 45.2% in the control group and 39.7% in the intervention group, indicating an absolute reduction of 5.5%.(13).

Prolonged Labour

The rate of prolonged Labourin this study before putting WHO LCG into action was 27 (12.5%). After its rollout, the number of cases dropped to 8 (3.7%) (p=0.001) (table 6) WHO LCG had a big effect on extended Labour cases, which decreased significantly. Oriji et al did a similar study and found that obstructed Labour happened 1.1% of the time. Obstructed Labour occurs at different rates around the world and even within countries. The World Health Organization said it occurs 3 – 6 times per 100 live births worldwide, with more cases in developing countries. Ethiopia saw it 12.2% of the time, Sokoto Nigeria 2%, and Enugu 2.7%.(19)

Obstructed Labour(OL)

There was a significant drop in OL after the roll-out of the LCG (p=0.068) showing a clear effect as after training it decreased from 12 (5.6%) to 5 (2.3%) (table 3). Evidence shows that OL, prevalent in 2-8% of low-resource settings, is linked to the lack of partograph use, as seen in Hawassa University Hospital, Ethiopia.(20) The WHO LCG was 10.4% more effective than the partograph in identifying prolonged and obstructed Labour, detecting 12 more obstructed cases and six additional combined cases.(21)

Postpartum Heamorrhage (PPH)

In this study, the occurrence of PPH declined from 51 (23.6%) to 22 (10.2%) after implementing the WHO LCG (p<0.001), showing a significant effect (table 3). In the research article, it is evident that "PPH occurs in approximately 1% to 3% of all deliveries and is the leading cause of obstetric morbidity and mortality worldwide."(22) Unsuccessful Labour monitoring increases PPH risks, with partograph errors associated with maternal mortality. Mentoring on proper partograph use ensures timely interventions and reduces PPH.(23)

Uterine Rupture and Maternal Mortality Rates

Uterine rupture reduced from 3 cases (1.4%) to 0 (p=0.082), and maternal deaths also reduced from 6 cases (2.8%) to 0 (p=0.014), which indicates the impact of the LCG on maternal outcomes (table 3). Uterine rupture reduced from 3 cases (1.4%) to 0 (p=0.082), and maternal deaths also reduced from 6 cases (2.8%) to 0 (p=0.014), which indicates the impact of the LCG on maternal outcomes (table 3). The article reports that a ruptured uterus can be difficult to diagnose, for example, traditional signs of tachycardia, abdominal pain and vaginal bleeding may be absent. Misoprostol increases the risk.(24) Thus, in addition to the partograph, the introduction of the Labour care guide could improve the decision-making process, increase the referral rates, and decrease maternal mortality.(25)

Enhanced Neonatal Survival and Reduction in Stillbirths

Neonatal outcomes were enhanced after using the WHO Labour Care Guide. Alive births of babies were also better than previously; 96.8% (209 cases) to 99.5% (215 cases) (p=0.032). Neonatal mortality also dropped from 3.7% (8 cases) to 0.5% (1 case) (p=0.06), and stillbirths also decreased from 1.4% (3 cases) to 0% (p=0.082). Moreover, the evidence pieces identified poor-quality partographs in 70.9% of the cases, which were linked with increased neonatal deaths, and 78% of the neonates were delivered alive, while 22% were stillbirths or early neonatal deaths.(8)

Improved Monitoring of Birth Asphyxia Incidence

This study showed: Before the WHO guidelines, two hundred and sixteen (100%) cases of birth asphyxia were unrecognized and, after implementation, all were recognized, of whom 206 (95.4%) had no birth asphyxia (p<0.001) (table 5). An article also stated that there were more Newborns with an Apgar score of >7 in the LCG group (94% vs 90%).(21) In the same manner, A partograph can help birth attendants to monitor the frequency, duration and strength of uterine contractions and the foetal heart rate during Labour to make decisions on the need for intervention and thus may contribute to the prevention of birth asphyxia.(26)

Reducing Labour-Associated Risks

Our study shows that the WHO LCG is effective in enhancing both maternal and neonatal outcomes. Following implementation, we noted a decrease in complications like obstructed Labour and postpartum heamorrhage , as emergency C-sections fell from 6% to 1.4% (p=0.011) and referrals reduced from 6% to 1.9% (p=0.026). Interventions, too, significantly improved from 4.2% to 95.8% (p<0.001). A funding research shows that a weak referral system, can cause delays in care, hence boosting maternal risks like rupture of the uterus, infertility, and fistula, in addition to neonatal risks such as asphyxia, stillbirth, and cerebral palsy. In addition, early referrals for C-section can avoid obstructed Labour, while delays can lead to haemorrhage, sepsis, and injuries during birth. It should be remembered that approximately one-third of the cases are affected by the failure to monitor partographs.(27)

5. LIMITATION

The evaluation of midwives' short-term outcomes and capabilities following training but not standard skills or long-term effects was conducted in the study. The findings are specific to midwives with no extension to other Labour care providers. There is sparse research on the WHO LCG, so we employed the evidence based on partograph available studies.

6. CONCLUSION

The WHO LCG, this research demonstrates, is an effective tool for enhancing the competence of midwives, enhancing the safety of delivery, and the enhancement of maternal and neonatal health outcomes. Effective routine application of the WHO LCG, it further contributes, is essential to reducing maternal and neonatal mortality significantly by enhancing timely intervention and preventing both short and long-term side effects. WHO LCG utilization within routine obstetric care is also central to the maximization of Labour monitoring as well as in providing maximum mother and newborn health.

Declaration

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I am extremely thankful to the midwives of Quetta, Balochistan for dedicating their time, effort, and commitment for this project. Thank you for your sustained commitment to safe motherhood and your enthusiasm for maternal and neonatal health. The study has greatly benefited from your support and input. It was a privilege to work with you and I greatly appreciate your professionalism, expertise, and diligence in carrying out this study.

Conflict of interest:

The authors declared that according to their current understanding no conflicts of interest exist regarding the study's publication.

Ethical Considerations:

Informed participants about the research objectives and schedule, explained the intervention clearly, obtained their written consent, ensured confidentiality of all sessions, and allowed them to withdraw from the study at any time were all ethical considerations.

Code of Ethics:

This study received ethical approval from the Research Ethics Committee (REC) at the University of Lahore, under the reference number ERC-UOL/174/08/24

Financial Assistance:

The investigation proceeded entirely without financial support.

Authors' contributions:

As an MScN student, I **Rukhsana Dost Muhammad** am the first author of this manuscript, conducted under the guidance and supervision of **Professor Sarfraz Masih**, with co-supervision by **Professor Muhammad Afzal**.

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