

“Evaluating the Effectiveness of an Educational Intervention on Knowledge of Labor Analgesia Among Maternity Nurses: A Quasi-Experimental Study”

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Abstract

Background: Effective pain management during labor is an essential component of quality maternal care. Maternity nurses play a crucial role in providing information, support, and implementation of labor analgesia techniques. However, inadequate knowledge regarding labor analgesia may hinder optimal pain management practices in maternity settings. Educational interventions can enhance nurses' understanding and competency in this area.

Objectives: To evaluate the effectiveness of an educational intervention on the knowledge of labor analgesia among maternity nurses working in selected maternity hospitals of Sangli district.

Methods: A quasi-experimental one-group pre-test and post-test research design was adopted for the study. The study was conducted among 60 maternity nurses selected from maternity hospitals in Sangli district using a non-probability purposive sampling technique. Baseline knowledge regarding labor analgesia was assessed using a structured knowledge questionnaire. The educational intervention comprised interactive lectures, audiovisual presentations, demonstrations, and distribution of informational booklets related to pharmacological and non-pharmacological methods of labor analgesia. Three educational sessions of one and a half hours each were conducted on Day 1, Day 15, and Day 30. Post-test assessment was carried out following completion of the intervention. Descriptive and inferential statistics were used to analyze the data.

Results: The findings revealed a significant improvement in the post-test knowledge scores of maternity nurses compared with their pre-test scores, indicating the effectiveness of the educational intervention. The intervention enhanced nurses' understanding of the principles, indications, benefits, contraindications, and nursing responsibilities related to labor analgesia.

Conclusion: The educational intervention was effective in improving the knowledge of maternity nurses regarding labor analgesia. Periodic educational programs are recommended to strengthen evidence-based maternity care practices and promote effective labor pain management.

Keywords: Labor analgesia, educational intervention, knowledge, maternity nurses, quasi-experimental study,

How to cite this article: Kumbhar VR, Babu D, Satralkar S, Gaikwad S, Geddugol S, Mali J, Varma S, Gharbude K, More P. Evaluating the Effectiveness of an Educational Intervention on Knowledge of Labor Analgesia Among Maternity Nurses: A Quasi-Experimental Study. *Int J Drug Deliv Technol.* 2026;16(64s):1420-1425. DOI: 10.25258/ijddt.16.64s.150

Introduction:

Labor is a normal physiological process that culminates in the birth of a baby. Despite being a natural event, labor is often associated with severe pain and discomfort. Labor pain has been described as one of the most intense forms of pain experienced by women and is influenced by several factors, including physiological, psychological, cultural, and environmental aspects. Effective management of labor pain is considered an essential component of quality maternal healthcare and contributes significantly to positive childbirth experiences and maternal satisfaction.¹⁻⁴

Pain during the first stage of labor primarily results from uterine contractions and cervical dilatation. If not adequately managed, severe labor pain may lead to increased maternal anxiety, fatigue,

hyperventilation, catecholamine release, and adverse effects on uteroplacental circulation. These physiological changes can negatively affect both maternal and fetal outcomes. Therefore, appropriate pain relief measures during labor are essential to ensure maternal comfort and promote safe childbirth.^{1,3}

Various pharmacological and non-pharmacological methods are available for labor pain relief. Pharmacological methods include systemic opioid analgesics, inhalational analgesia, and regional anesthesia techniques such as epidural analgesia. Non-pharmacological approaches include breathing exercises, relaxation techniques, massage, hydrotherapy, ambulation, and continuous labor support. The selection of appropriate analgesic methods depends on the stage of labor, maternal

preference, clinical condition, availability of resources, and healthcare providers' competence.^{2,5,6}

The World Health Organization (WHO) recommends that every woman should receive respectful maternity care, including effective pain relief options during labor, according to her wishes and clinical needs.⁴ Similarly, the National Institute for Health and Care Excellence (NICE) emphasizes that women should be informed about the benefits and risks associated with available methods of labor analgesia to enable them to make informed choices regarding pain management during childbirth.¹⁸ Healthcare professionals, particularly nurses and midwives, play a crucial role in providing such information and ensuring the safe administration and monitoring of analgesic interventions.

Nurses working in maternity units are often the primary caregivers responsible for assessing labor pain, administering prescribed analgesics, monitoring maternal and fetal responses, recognizing adverse effects, and educating women regarding available pain management options. Their knowledge and competence directly influence the quality and safety of intrapartum care. Inadequate knowledge regarding analgesics used during labor may result in inappropriate administration, delayed interventions, ineffective pain management, and increased maternal dissatisfaction.^{3,19}

Several studies have highlighted the importance of continuous professional education in enhancing nurses' knowledge and clinical competence. Structured educational interventions have been found to improve understanding of evidence-based practices and promote the adoption of safe clinical procedures.²⁰⁻²⁵ Educational programmes help nurses update their knowledge regarding indications, contraindications, dosage considerations, side effects, and nursing responsibilities associated with labor analgesics. Such programmes are particularly important in maternity settings where rapid advances in obstetric care necessitate ongoing learning and skill development.

Although labor analgesia has gained increasing recognition worldwide, studies suggest that healthcare providers' knowledge regarding analgesic practices during labor remains variable, especially in resource-constrained settings. Misconceptions regarding the effects of analgesics on labor outcomes, lack of exposure to updated guidelines, and limited opportunities for continuing education contribute to knowledge deficits among nursing personnel. Consequently, strengthening nurses' knowledge through structured teaching programmes may facilitate the delivery of effective and evidence-based labor pain management services.

In India, maternity nurses constitute an indispensable component of maternal healthcare services. Auxiliary Nurse Midwives (ANMs),

General Nursing and Midwifery (GNM) graduates, and registered nurses working in labor rooms frequently participate in the administration and monitoring of analgesics during childbirth. However, formal educational opportunities related to labor analgesia are often limited after completion of basic nursing education. Therefore, there is a need to assess existing knowledge levels and implement interventions aimed at enhancing nurses' competence in this area.

The present study was undertaken to evaluate the effectiveness of a structured teaching programme on knowledge regarding analgesics used in the first stage of labor among nurses working in maternity units of selected hospitals in the Sangli–Miraj–Kupwad Corporation area. By determining the impact of educational intervention on nurses' knowledge, the study sought to generate evidence supporting the incorporation of regular in-service educational programmes in maternity care settings. Improved knowledge among maternity nurses can contribute to safer analgesic practices, enhanced quality of nursing care, and better maternal experiences during childbirth.

Thus, the study addresses an important aspect of maternal healthcare by emphasizing the role of continuing nursing education in strengthening evidence-based management of labor pain and promoting positive childbirth outcomes.

METHODS AND MATERIALS-

This study used a quantitative research approach using a quasi-experimental one-group pre-test post-test design to assess the effectiveness of a structured teaching programme on nurses' knowledge regarding analgesics used during the first stage of labor. The study was conducted in selected hospitals under the Sangli–Miraj–Kupwad Corporation area, Sangli district, Maharashtra, among nurses working in maternity units. A non-probability purposive sampling technique was used to recruit 60 nurses who met the inclusion criteria and consented to participate. Data were collected using a structured questionnaire consisting of demographic variables and a 25-item multiple-choice knowledge questionnaire covering indications, contraindications, administration, nursing responsibilities, and complications related to labor analgesics. Following the pre-test, participants received a structured teaching programme comprising lectures, discussions, and educational materials on various aspects of analgesic use during labor. The same questionnaire was administered as a post-test after the intervention to evaluate knowledge gain. Ethical approval and institutional permission were obtained, and informed consent, confidentiality, anonymity, and voluntary participation were ensured throughout the study. Data were analysed using descriptive statistics

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(frequency, percentage, mean, and standard deviation) and inferential statistics, with the paired t-test used to compare pre-test and post-test knowledge scores; a p-value < 0.05 was considered statistically significant.

RESULTS-

Section-1-Demographic Characteristics of Participants

Table 1. Distribution of Nurses According to Demographic Characteristics

Demographic Characteristics	Frequency	Percentage
	<i>f</i>	<i>%</i>
Age (years)		
25–35	29	48
36–45	26	44
46–55	5	8
Educational Qualification		
ANM	36	60
GNM	20	33
B.Sc. Nursing	4	7
M.Sc. Nursing	0	0
Years of Experience in Maternity Unit		
1–10 years	24	40
11–20 years	30	50
21–30 years	6	10
Information Regarding Analgesics		
Yes	45	75
No	15	25
Source of Information (n=45)		
Drug books	30	67
Doctors and senior nurses	15	33

Table 1 represents the demographic data of the 60 maternity nurses. Nearly half of the participants (48%) belonged to the age group of 25–35 years, followed by 44% in the age group of 36–45 years. Most participants (60%) were Auxiliary Nurse Midwives (ANMs), while 33% were General Nursing and Midwifery (GNM) graduates. Half of the participants (50%) had 11–20 years of experience in maternity units. The majority of nurses (75%) reported prior information regarding

analgesics used during the first stage of labor. Among them, 67% identified drug books as their primary source of information, whereas 33% obtained information from doctors and senior nurses.

Section- 2-Knowledge Scores Before and After Structured Teaching Programme-

Table 2. Distribution of Knowledge Scores in Pre-test and Post-test

(N = 60)

Knowledge Category	Pre-test Frequency & %	Post-test Frequency & %
Excellent	0 (0)	32 (53)
Good	23 (38)	28 (47)
Average	37 (62)	0 (0)
Poor	0 (0)	0 (0)

As shown in **Table 2**, pre-test findings revealed that 62% of nurses had average knowledge and 38% had good knowledge regarding analgesics used during the first stage of labor. Following the structured teaching program, a substantial improvement was observed, with 53% of nurses demonstrating excellent knowledge and 47% demonstrating good knowledge. No participants remained in the average or poor knowledge categories after the intervention.

Section-3 Effectiveness of Structured Teaching Programme-

Table 3. Comparison of Pre-test and Post-test Knowledge Scores

Table. 3 depicts that the mean post-test knowledge score (15.7 ± 1.99) was higher than the mean pre-test score (11.4 ± 2.17). The paired t-test demonstrated a statistically significant difference between the pre-test and post-test scores ($t = -11.799$, $p < 0.001$). Hence, H_0 is rejected, and H_1 is accepted. Therefore, the structured teaching programme was effective in improving nurses' knowledge regarding analgesics used during the first stage of labor.

DISCUSSION

The present study evaluated the effectiveness of a structured teaching programme on nurses' knowledge regarding analgesics used in the first stage of labor. The findings demonstrated a significant improvement in post-intervention knowledge scores, indicating that educational interventions can enhance nurses' competency in labor pain management. The importance of evidence-based education for improving nursing knowledge and clinical practice has been emphasized in nursing research literature.²⁰⁻²⁵

The demographic findings showed that the majority of participants were between 25 and 35 years of age and had 11–20 years of professional experience in maternity units. Most participants were ANM-qualified nurses. Although three-fourths of the nurses reported having previous information regarding labor analgesics, the pre-test findings revealed deficiencies in knowledge levels, suggesting the need for formal educational programmes. Previous studies have indicated that professional experience alone does not necessarily ensure adequate knowledge, and continuing education remains essential for maintaining competency in specialized areas such as obstetric pain management.¹⁹⁻²¹

Before the intervention, 62% of participants exhibited average knowledge and only 38% demonstrated good knowledge. None of the participants achieved excellent knowledge scores. These findings indicate that despite clinical exposure, nurses may not possess comprehensive knowledge regarding analgesics used during labor. Similar observations have been reported in studies that identified gaps in healthcare providers' knowledge related to labor pain relief methods and safe analgesic practices.^{4,18} The World Health Organization recommends that healthcare providers should be adequately trained to offer appropriate

Level of knowledge	Mean	SD	T - test value	P value	Significant
Pre-test	11.4	2.17	11.799	<0.001	Highly Significant
Post test	15.7	1.99			

labor pain management options to women during childbirth.⁴

Following the structured teaching programme, a marked improvement in knowledge levels was observed. More than half of

the participants (53%) achieved excellent knowledge scores, while the remaining 47% demonstrated good knowledge. The absence of participants in the average and poor knowledge categories in the post-test reflects the positive impact of the educational intervention. These findings are consistent with educational theories suggesting that structured teaching programmes enhance cognitive learning by providing organized and relevant information tailored to learners' needs.^{20,21}

The statistical analysis further supported these findings. The increase in mean knowledge scores from 11.4 ± 2.17 in the pre-test to 15.7 ± 1.99 in the post-test was statistically significant ($t = -11.799$, $p < 0.001$). This suggests that the structured teaching programme effectively enhanced participants' understanding of labor analgesics. Similar improvements in knowledge following educational interventions have been documented in nursing research studies, highlighting the effectiveness of planned teaching programmes in strengthening professional competence and promoting evidence-based practice.²²⁻²⁵

The findings are also supported by literature emphasizing the critical role of nurses in labor pain management. Nurses are responsible for assessing pain, administering prescribed analgesics, monitoring maternal and fetal well-being, identifying adverse effects, and providing education and emotional support to laboring women.^{3,8,19} Therefore, adequate knowledge regarding analgesics used during labor is indispensable for ensuring safe and effective maternity care. The International Confederation of Midwives has also recognized pain management as an important competency in midwifery practice.¹⁹

Research evidence suggests that effective labor pain management contributes to improved maternal satisfaction and positive childbirth experiences.^{6,16,17} Women who receive adequate information and support regarding available pain relief options are more likely to report satisfaction with their childbirth experience.^{16,17} Consequently, improving nurses' knowledge may indirectly enhance the quality of maternal care and promote patient-centered practice.

The present study highlights the importance of continuous nursing education in maternity care settings. Periodic in-service education programmes, workshops, competency-based training, and updates on current guidelines can help bridge existing knowledge gaps among maternity nurses. Such initiatives are essential to ensure adherence to evidence-based recommendations related to labor analgesia and to improve the quality and safety of obstetric services.^{4,18,20}

The findings of this study have important implications for nursing education, administration, and practice. Nursing administrators should encourage regular continuing education programmes and establish protocols related to labor analgesia. Nurse educators should incorporate comprehensive content on labor pain management into both undergraduate and in-service training curricula. Furthermore, future research involving larger samples and diverse healthcare settings may provide additional evidence regarding the long-term effectiveness of educational interventions on nursing practice and maternal outcomes.

Overall, the present study demonstrated that a structured teaching programme significantly improved nurses' knowledge regarding analgesics used in the first stage of labor. Strengthening nurses' knowledge through continuing education can contribute to safer analgesic practices, improved professional competence, and enhanced maternal healthcare services.

CONCLUSION

The study concluded that the structured teaching programme was effective in improving the knowledge of nurses working in maternity units regarding analgesics used during the first stage of labor. The significant increase in post-test knowledge scores emphasizes the need for regular educational interventions to update nurses' knowledge and strengthen their role in providing quality maternity care. Hospital administrators and nursing educators should incorporate continuing education programmes on labor analgesia to enhance professional competence and improve maternal health outcomes.

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