

Effect of In-service Training Program on Obstetric Nurses' Knowledge, Attitudes and Practices Regarding Painless Labor

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Abstract: Painless labor is the most trend topic among pregnant women nowadays. Inadequate knowledge, negative attitudes, and lack of training among obstetric nurses' were major obstacles in implementing effective painless labor. **Aim of the study:** Determine the impact of in-service training program on obstetric nurses' knowledge, attitudes and practices regarding painless labor in addition to identify the perceived obstacles related to painless labor among the studied nurses. **Subjects and Method:** A quasi-experimental research design was used. **Setting:** This study was carried out at labor units Tanta University and El-Menshawy General Hospitals. **Subjects:** All nurses (60) who are working at the previously mentioned settings were included. **Four tools were used: Tool (I): Obstetric nurses' knowledge questionnaire regarding painless labor, Tool (II): Obstetric nurses' attitudes regarding painless labor, Tool (III): Nurses' practices observational checklist toward painless labor and Tool (IV): Obstacles that prevent the use of painless labor methods among obstetric nurses. Results:** obstetric nurses' level of knowledge, attitudes and practices post implementing the in-service training program regarding painless labor was highly improved than pre implementation. Also, the main obstacles that hinder the use of painless labor were; hospital policy in the health care system, difficult of method application among nurses, and unusefulness of painless labor methods related to patient obstacles. **Conclusion:** Application of the in-service training program achieved significant improvement in obstetric nurses' knowledge, attitudes and practices related to painless labor. **Recommendations:** Reapplication of the in-service program in other geographical areas in Egypt regarding painless labor.

Keywords: In-service Training Program, Obstetric nurses, Painless labor.

Introduction

Childbirth is associated with the most severe pain a woman will ever experience throughout her life. Women described labor pain with terms such as distressing, overwhelming, traumatic, horrible or unbearable during the first stage of labor and even worse during the second stage. ⁽¹⁻³⁾ Labor pain may result from the myometrial ischemia during uterine contractions in addition to cervical, vaginal, and perineal stretching particularly throughout the second stage of

labor. ⁽⁴⁾ It is usually felt in the lumbar, sacral, pelvic, and abdominal areas. ⁽⁵⁾

Severe pain negatively affects the process of labor. It may result in premature bearing down in the first stage of labor against an un-dilated or partially dilated cervix leading to tears and subsequent postpartum hemorrhage. ⁽⁶⁾ In addition to, maternal fear, stress, anxiety, nausea, increased sympathetic response and hyperventilation which may lead to uncoordinated uterine action. ⁽⁷⁻⁹⁾ Therefore,

effective management of labor pain is an important issue for better maternal and neonatal outcome.⁽⁷⁾

Painless labor is the most trending topic among pregnant women nowadays.⁽³⁾ There is a wide spectrum of painless labor methods including non-pharmacological and pharmacological methods.^(10,11) Non-pharmacological options available for pain relief in labor include continuous social support, homeopathy, hydrotherapy, hypnosis, music therapy, transcutaneous electrical nerve stimulator (TENS), breathing and relaxation techniques, massage, hot and cold water therapy bags, acupressure, acupuncture and aromatherapy.^(5,12-15) The pharmacological analgesia for labor pain include nonopioids (ketamine and acetaminophen), opioids (nalbuphine, pethidine, diamorphine, meperidine and fentanyl), inhalational and regional analgesia for labor (epidural analgesia, combined spinal-epidural, and peripheral nerve blocks).^(4, 16-19) Yet, the presence of skilled birth attendants is a crucial for applying these management options.⁽¹²⁾

Obstetric nurses spend a significant portion of their time with in labor women and have a vital role in the decision-making process regarding the management of labor pain.⁽²⁰⁾ They have a critical role in assessing in labor women's perception of pain; documenting the pain; offering and providing different non-pharmacological and pharmacological options for pain management; evaluating the maternal and fetal response to treatment, including desired and adverse effects; assessing the women's satisfaction with that options; modifying the plane of care as needed; and documenting each of these aspects of labor pain management.^(21, 22) Moreover, nurses can also advocate for integrating labor pain management in the hospitals policy as an

essential human right for all women during labor.

Significance of the study

Egypt is ranked first globally in the number of cesarean section (CS) deliveries which make up 75-80% of deliveries, in comparison to an average of 25-30% worldwide as reported by the Egyptian Ministry of Health.⁽²⁴⁾ Applying painless labor methods can help in reducing the increased rates of CS with its associated complications.^(25,26)

Inadequate knowledge, negative attitudes, lack of trained personnel for effectively managing labor pain and absence of painless labor protocols were reported as major obstacles in the implementation of effective labor pain management.⁽²⁷⁾ So, providing obstetric nurses with the up to date labor pain management evidence based knowledge and practices will contribute to improve their attitudes toward painless labor methods. Which represent the aim of our study.

Aim of the study

The aim of this study is to

1. Determine the impact of in-service training program on obstetric nurses' knowledge, attitudes and practices regarding painless labor.
2. Identify the perceived obstacles related to painless labor among the studied nurses.

Research hypothesis

The in-service training program is expected to improve obstetric nurses' knowledge, attitudes and practices regarding painless labor.

Operational Definition

Painless labor: Refers to using pain relieve methods during labor as non-pharmacological and pharmacological methods to help women cope with labor pain or relieve it.

I. Subjects and Method

Research Design: A quasi-experimental research design was used to conduct this study.

Setting: This study was carried out at labor

units of obstetrics departments of:

1. Tanta University Hospital (Ministry of Higher Education).
2. El-Menshawya General Hospital (Ministry of Health and Population).

Subjects

- All nurses (60) who were working at the previously mentioned study settings were included in the current study.

Tools of data collection

To achieve the aim of this study, four tools were used as follows:

Tool (I): Obstetric nurses' knowledge questionnaire regarding painless labor: It was developed by the researchers after reviewing the related recent literatures. It comprised the following two parts:

Part (1): Socio demographic characteristics of nurses: This part collected the nurses' basic data included; age, current marital status, residence, educational qualification, place of work, years of experience and previous attendance of a training program and/or workshop regarding painless labor.

Part(2): Obstetric nurses' knowledge regarding painless labor: It was used to assess nurses' knowledge regarding labor pain which includes; causes, effects on the mother and fetus, site, onset, and methods used to assess it. Also, it was used to assess nurses' knowledge regarding; definition of painless labor, importance of relieving labor pain, and methods of painless labor, both non-pharmacological and pharmacological methods including; types, appropriate time of use, advantages and disadvantages of both methods. In addition, it was used to assess nurses' knowledge regarding; contraindications of painless labor methods, maternal and fetal side effects of painless labor methods, and effect of painless labor methods on labor process.

The scoring system for obstetric nurses'

knowledge regarding painless labor was categorized as follows:

- Correct and complete answers were scored as (2).
- Correct and incomplete answers were scored as (1).
- Incorrect and don't know answers were scored as (0).

The total knowledge scores was calculated as follow

- High level of knowledge 80-100%.
- Moderate level of knowledge 60 -<80%.
- Low level of knowledge <60%.

Tool (II): Obstetric nurses' attitudes regarding painless labor.

This tool was adapted from **Hasan et al (2016)⁽²⁸⁾, McCauley et al (2017)⁽²⁹⁾, Mousa et al (2018)⁽³⁰⁾ and Delwatta et al (2019)⁽³¹⁾.**

It was used to assess nurses' attitudes regarding painless labor (non-pharmacological and pharmacological methods). It consisted of 19 statements (positive and negative) such as; pain relief during labor is necessary, painless labor methods help women perform much better during labor, using some methods during labor reduces the intensity of pain, and the use of painless labor methods can affect the progress of labor.

The scoring system of obstetric nurses' attitudes regarding painless labor was as follows:

Each statement was rated by using 3 point Likert scale, where:

- Each positive statement scored as (2) if nurses' response was agree, (1) if it was uncertain and zero if it was disagree.
- Each negative statement scored as (2) if nurses' response was disagree, (1) if it was uncertain and zero if it was agree.

The total attitudes score of obstetric nurses' was calculated as follows:

- Positive attitudes \geq 60% of the total score.

- Negative attitudes < 60% of the total score.

Tool (III): Nurses' practices observational checklist toward painless labor. This tool was developed by the researchers and adapted from **Ohaeri B et al (2019)**⁽³²⁾, **Solomon E et al (2021)**⁽¹²⁾ to assess obstetric nurses' practices steps regarding painless labor which consisted of ; prepare the necessary equipment, environment, and the woman. As well as taking complete history of the woman, assessment of pain level, assessment of the physiological and behavioral responses to labor pain, ask woman to choose pain relive method from the available options (acupressure points, massage, deep breathing exercise, changing positions, and continuous support, intravenous or intramuscular pethidine or morphine, spinal analgesia, and epidural analgesia). In addition to assess effectiveness of chosen method and post procedure tasks.

The scoring system for obstetric nurses' practices toward painless labor was as follows:

- Done correctly and completely was scored (2).
- Done correctly but incompletely was scored (1).
- Done incorrectly or not done was scored (0).

The total practices scores of obstetric nurses' were summed up and converted into percent score as follows

Satisfactory practice: $\geq 80\%$

- Unsatisfactory practice: < 80%.

Tool (IV): Obstacles that prevent the use of painless labor methods among obstetric nurses: It was developed by the researchers to assess obstacles that prevent the use of painless labor methods. They were divided to the obstacles ; in the health care system, nurses, and the patient obstacles which hinder the use of painless labor.

Method

1. Administrative approval: An official letter clarifying the purpose of the study was obtained from the Faculty of Nursing and was submitted to the responsible authorities of the selected study settings to obtain their approval and cooperation for conducting the study.

2. Ethical and legal considerations: The approval of ethical committee was obtained with a code number (272-6-2023). After explaining the purpose of the study nurse's informed consent was obtained to participate in the study. The nature of the study did not cause any harm or pain for the entire sample. Also, confidentiality and privacy were ascertained regarding the data collected and each subject was free to withdraw from the study at any time.

3. Tools development: They were developed by the researchers after reviewing the recent related literatures. They were translated into Arabic language and tested for content and construct validity by 5 experts in the field of Maternal and Neonatal Nursing. The test revealed that it was 0.91, 0.93, 0.95 and 0.97 respectively. While, the reliability of the translated Arabic tools was tested using Cronbach's alpha test, which was 0.882, 0.885, 0.887 and 0.889 respectively.

4. Pilot Study: After the development of the tools, a pilot study was conducted on 10% of the total sample (6 obstetric nurses) from the previously mentioned settings to ascertain the clarity, feasibility and applicability of the developed tools. The pilot study was conducted before the actual data collection. There were no major changes in the tools, so the data obtained from the pilot study were included.

5. Field work: Data collection was conducted through **4 phases:** assessment, planning, implementation, and evaluation as follows:

— **Assessment phase (Pre-test):** After explaining the purpose of the study by the researchers before the application of in-service training program, the obstetric nurses were assessed using **Tool (I) part (1)** to collect their socio-demographic characteristics, **part (2)** to assess their knowledge regarding painless labor. Also, **Tool II** was used to assess obstetric nurses' attitudes regarding painless labor. Then **Tool III** was used to assess nurses' practices regarding painless labor. Finally, **Tool (IV)** was used to assess obstacles that prevent the use of painless labor methods among obstetric nurses.

— **Planning phase:** An appropriate in-service training program was prepared by the researchers based on the assessment phase after assessing nurses' knowledge, attitudes and practices regarding painless labor. The purpose of the study were explained for nurses and obtained their consent to participate. Planning phase included two parts: theoretical part which entailed knowledge regarding painless labor and practical part related to steps of nurses' practices regarding painless labor observational checklist. Also this phase included preparation of the in-service training program content; an Arabic educational booklet was developed by the researchers used as a guide for nurses regarding painless labor.

- As well as, different methods of teaching were prepared to conduct the in-service training program which included; lectures, group discussion, posters, power point, demonstration and re-demonstration and video scenarios presentation.

— **Implementation phase**

- To implement the content of the in-service training program, 4 sessions (2 sessions for theoretical part and 2 sessions for practical part) were implemented at the previously mentioned study settings. The data was

collected over a period of 6 months from the beginning of November 2022 to the end April 2023.

- The total numbers of nurses (60 nurses) were divided into 10 groups. Each group included 6 nurses and the in-service training program sessions were conducted over 4 days per week at morning and afternoon shifts.

- The duration of each session ranged from 30 to 45 minutes including periods of discussion. The sessions were as follow:

- **The first theoretical session:** At the beginning an orientation to the significance and the purpose of the study were clarified. This session included providing nurses with knowledge about causes of labor pain, effects of labor pain on the mother and fetus, site, onset, methods used to assess labor pain, definition of painless labor, and importance of relieving labor pain and methods of painless labor.
- **The second theoretical session:** It gave feedback for the previous session and provide knowledge about both non-pharmacological and pharmacological methods including; types, appropriate time of use, advantages and disadvantages of both methods, contraindications of painless labor methods, maternal and fetal side effects of painless labor methods, and the effect of painless labor methods on labor process.
- **The third practical session:** Nurses were trained regarding the procedure of pain management which includes performing; pre procedure tasks, taking complete history of woman, assessment of pain level, and assessment of the physiological and behavioral responses of woman to labor pain.
- **The fourth practical session:** During this session, first the nurses re-demonstrated the practical skills from the previous session. Second, nurses were trained about providing

practical skills regarding available pain relieve options to the woman including; acupressure points, massage, deep breathing exercise, changing positions, and continuous support. In addition to assisting doctor with pharmacological, methods of painless labor as; intravenous or intramuscular pethidine or morphine, spinal analgesia, and epidural analgesia.

Also, nurses were trained how to assess effectiveness of the chosen method through assessing labor pain intensity as well as performing post procedure tasks.

— **Phase IV: Evaluation phase (Post-test):** Obstetric nurses' knowledge, attitudes and practices were assessed immediately post and one month later after the in-service training program application by using; **Tool (I) part (2), Tool (II) and Tool (III).**

6. Statistical analysis

The collected data were coded, entered, tabulated and analyzed using SPSS (Statistical Package for Social Science) version 25 (IBM Corporation, Armonk, NY, USA). For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, which describe a categorical set of data by frequency, percentage or proportion of each category, comparison between two groups and more was done using Chi-square test (χ^2). For comparison between related more than two means of non-parametric data (pre, immediate post and one month post educational training program), Friedman Test (χ^2 value) was calculated. Correlation between variables was evaluated using Pearson's correlation coefficient (r).

I. Results

Table (1): shows that the age of the studied nurses ranged from 21-59 years old with a mean of 27.58 ± 4.58 and (56.7%) of them were divorced. Regarding the educational

qualifications, (53.3%) of the studied nurses had Nursing Technician Diploma with years of experience ranged from 1-15 years. However, the entire sample didn't attend any training program or workshop about painless labor.

Table (2): Reveals that there were high statistical significant differences in the mean frequency of the total knowledge responses of the studied nurses related to all items about painless labor throughout the program intervention where ($p < 0.001$). It was observed that pre-program (51.7%) of the studied nurses gave incorrect answers or had no knowledge about all items of painless labor. But immediately post-program, these results significantly improved to be correct and complete answers among (86.7%) of them and slightly decreased one month later among (81.7%) of them.

Figure (1): Illustrates that the total knowledge score of the studied nurses was low among (95.0%) of them preprogram which significantly improved to be high among (93.3%) of them immediately post-program and slightly decreased to (83.3%) one month later.

Figure (2): Clarifies that 65.0% of the studied nurses had a positive attitude toward painless labor before program application increased to 98.3% immediately post-program and slightly decreased to (93.3%) one month later with a highly statistically significant difference where ($p = < 0.0001^*$).

Table (3): Demonstrates that there were high statistical significant differences in the mean frequency of the total practice responses of the studied nurses related to all items about painless labor throughout the program intervention where ($p < 0.0001^*$). It was observed that pre-program (65.0%) of the studied nurses done incorrectly or not done all items of painless labor. But immediately post-

program, these results significantly improved to be done correctly and completely among (86.7%) of them and slightly decreased one month later among (76.7%) of them.

Figure (3): Reveals that there was highly statistically improvement in the total practices scores of the studied nurses toward painless labor after implementing the program. All of the studied nurses 100% had unsatisfactory practices preprogram application that is improved to be satisfactory among 95% of them immediately post program and slightly decreased to 70% one month later.

Table (4): Demonstrates that there was a statistical significant positive correlation between the studied nurses' overall score of knowledge with their total attitude toward painless labor immediately and one month post-program application ($r= 0.604$ $p= 0.0001^*$ and $r= 0.310$ $p= 0.016^*$ respectively). The table also reveals the significant positive correlation between the studied nurses' overall score of knowledge with their total practice toward

painless labor before, immediately and one month post-program application ($r= 0.419$ $p= 0.001^*$, $r= 0.415$ $p= 0.001^*$ and $r= 0.444$ $p= 0.0001^*$ respectively).

Figure (4): Illustrates that hospital policy, insufficient staff members and shortage of time represents the main obstacles related to health care system as perceived by (85.0%, 73.3% and 63.4% respectively) of the studied nurses. Additionally (60.0% and 55.0% respectively) of the studied nurses reported that difficulties of applying painless labor and lack of knowledge about it are considered the obstacles from their side. Concerning the obstacles related to mothers, (88.4%, 86.6% and 71.7% respectively) of the studied nurses mentioned that women's beliefs about pain and their thoughts that painless labor methods will be not useful for them as well as women's unwillingness are the most noticed obstacles.

Table (1): Socio-demographic characteristics of the studied nurses (n=60).

Socio-demographic characteristics.	The studied nurses (n=60)	
	N	%
Age : (years)		
Range	21-59	
Mean±SD	27.58±4.58	
Current marital status:		
Married	24	40.0
Divorced	34	56.7
Single	2	3.3
Place of residence:		
Rural	22	36.7
Urban	38	63.3
Educational qualification:		
Nursing Technician Diploma	32	53.3
Nursing Technical Institute	20	33.3
Bachelor of Nursing	8	13.3
Place of work:		
Tanta University Hospitals	38	63.3
El-Menshawey General Hospital	22	36.7
Years of experience:		
<5	15	25.0
5-10	8	13.3
10-15	37	61.7
Range	1-15	
Mean±SD	14.42±3.78	
Attendance of a training program and/or workshop about painless labor:		
No	60	100

Table (2): Knowledge of the studied nurses regarding painless labor pre and post in-service training program (n=60).

Knowledge items about painless labor	Responses of the studied nurses pre and post in-service training program (n=60)																		χ^2 test	P value
	Pre						Immediate post						One month post							
	Incorrect or don't know		Correct and incomplete answer		Correct and complete answer		Incorrect or don't know		Correct and incomplete answer		Correct and complete answer		Incorrect or don't know		Correct and incomplete answer		Correct and complete answer			
	N	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%		
- Causes of L. pain.	4	6.7	45	75.0	11	18.3	1	1.7	2	3.3	57	95.0	3	5.0	5	8.3	52	86.7	100.100	0.0001*
- Effects of L. pain on mother	19	31.7	39	65.0	2	3.3	1	1.7	7	11.7	52	86.7	2	3.3	26	43.3	32	53.3	93.678	0.0001*
- Effects of L. pain on fetus.	56	93.3	0	0	4	6.7	57	95.0	0	0	3	5.0	40	66.7	12	20.0	8	13.3	30.369	0.0001*
- Site of L. pain.	5	8.3	0	0	55	91.7	3	5.0	0	0	57	95.0	5	8.3	0	0	55	91.7	0.663	0.718
- Onset of L. pain.	43	71.7	0	0	17	28.3	9	15.0	0	0	51	85.0	12	20.0	1	1.7	47	78.3	53.236	0.0001*
- Methods used to assess labor pain	34	56.7	23	38.3	3	5.0	1	1.7	7	11.7	52	86.7	3	5.0	13	21.7	44	73.3	105.048	0.0001*
- Definition of painless labor.	41	68.3	3	5.0	16	26.7	3	5.0	0	0	57	95.0	8	13.3	0	0	52	86.7	79.208	0.0001*
- Importance of relieving L. pain	7	11.7	44	73.3	9	15.0	2	3.3	2	3.3	56	93.3	2	3.3	7	11.7	51	85.0	98.596	0.0001*
- Methods of painless labor.	20	33.3	21	35.0	19	31.7	2	3.3	1	1.7	57	95.0	5	8.3	5	8.3	50	83.3	65.032	0.0001*
- Non-pharmacological methods of painless labor.																				
- Types.	22	36.7	36	60.0	2	3.3	1	1.7	4	6.7	55	91.7	1	1.7	6	10.0	53	88.3	127.881	0.0001*
- Appropriate time of use	52	86.7	1	1.7	7	11.7	13	21.7	0	0	47	78.3	2	3.3	0	0	58	96.7	102.410	0.0001*
- Advantages	36	60.0	19	31.7	5	8.3	1	1.7	4	6.7	55	91.7	1	1.7	11	18.3	48	80.0	115.137	0.0001*
- Disadvantages	36	60.0	20	33.3	4	6.7	1	1.7	3	5.0	56	93.3	1	1.7	11	18.3	48	80.0	120.794	0.0001*
- Pharmacological methods of painless labor																				
- Types.	13	21.7	47	78.3	0	0	1	1.7	3	5.0	56	93.3	1	1.7	6	10.0	53	88.3	138.574	0.0001*
- Appropriate time of use	53	88.3	0	0	7	11.7	12	20.0	0	0	48	80.0	7	11.7	1	1.7	52	86.7	89.868	0.0001*
- Advantages	24	40.0	32	53.3	4	6.7	1	1.7	1	1.7	57	96.6	1	1.7	4	6.7	55	91.7	134.447	0.0001*

- Disadvantages	34	56.7	24	40.0	2	3.3	1	1.7	2	3.3	57	95.0	2	3.3	4	6.7	54	90.0	137.514	0.0001*
- Contraindications of painless labor methods.	34	56.7	22	36.7	4	6.7	1	1.7	3	5.0	56	93.3	2	3.3	2	3.3	56	93.3	131.978	0.0001*

Table (2): Continue.

Knowledge items about painless labor	Responses of the studied nurses pre and post in-service training program (n=60)																		χ^2 test	P value
	Pre						Immediate post						One month post							
	Incorrect or don't know		Correct and incomplete answer		Correct and complete answer		Incorrect or don't know		Correct and incomplete answer		Correct and complete answer		Incorrect or don't know		Correct and incomplete answer		Correct and complete answer			
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%		
- Maternal side effects of painless labor methods.	34	56.7	23	38.3	3	5.0	1	1.7	2	3.3	57	95.0	1	1.7	2	3.3	57	95.0	143.013	0.0001*
- Fetal side effects of painless labor methods.	38	63.3	20	33.3	2	3.3	1	1.7	1	1.7	58	96.7	2	3.3	1	1.7	57	95.0	150.509	0.0001*
- Effect of painless labor methods on labor process.	48	80.0	11	18.3	1	1.7	14	23.3	4	6.7	42	70.0	7	11.7	7	11.7	46	76.7	87.010	0.0001*
Total knowledge response (Mean frequency)	31	51.7	21	35.0	8	13.3	6	10.0	2	3.3	52	86.7	5	8.3	6	10.0	49	81.7	81.586	0.0001*

*Statistically significant (P<0.05)

L. pain= Labor pain

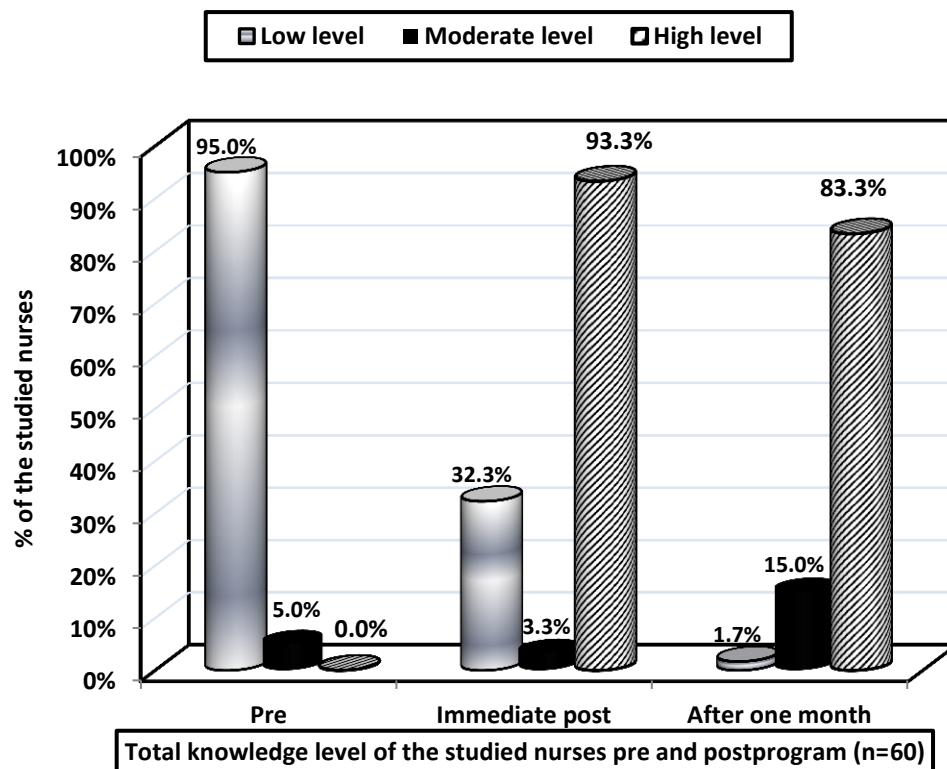


Figure (1): Total knowledge scores' level of the studied nurses regarding painless labor pre and post in-service training program (n=60).

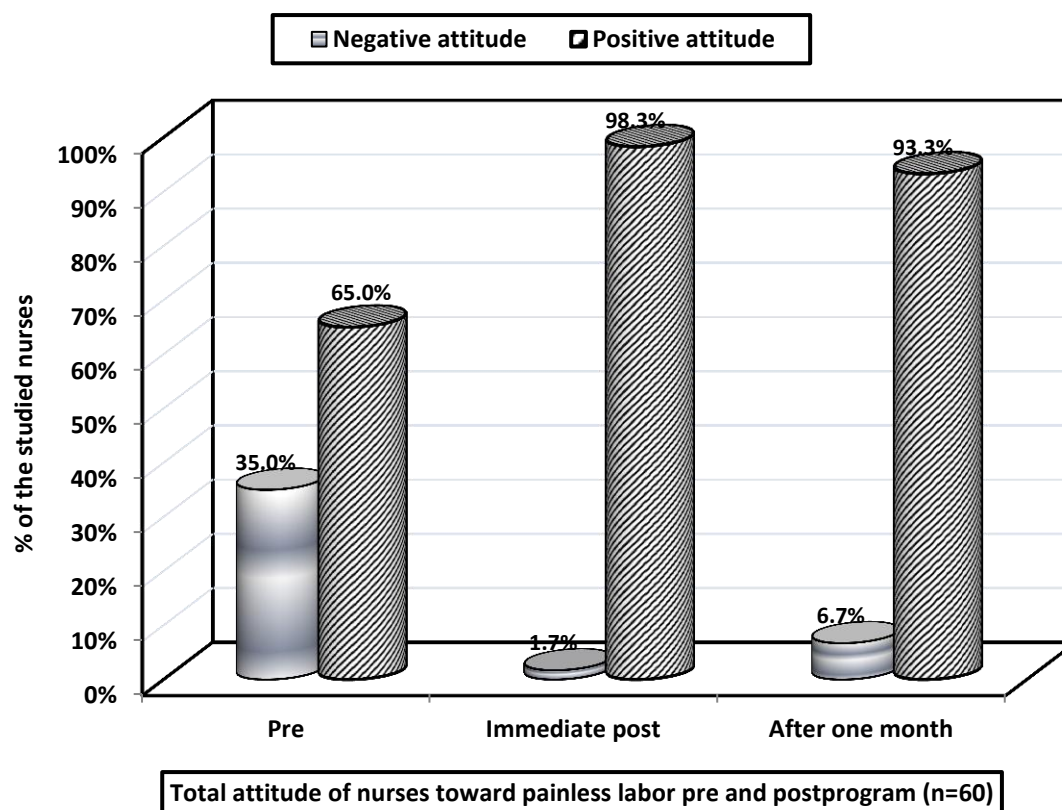


Figure (2): Total attitude of the studied nurses toward painless labor pre and post in-service training program (n=60).

Table (3): Practices of the studied nurses toward painless labor pre and post in-service training program (n=60).

Practice items toward painless labor	Responses of the studied nurses' practice steps pre and post in-service training program (n=60)																		χ^2 test	P value
	Pre						Immediate post						One month post							
	Done incorrectly or not done		Done correctly but incompletely		Done correctly and completely		Done incorrectly or not done		Done correctly but incompletely		Done correctly and completely		Done incorrectly or not done		Done correctly but incompletely		Done correctly and completely			
	n	%	n	%	n	%	N	%	n	%	n	%	n	%	n	%	n	%		
1-Prepare the necessary equipment.	13	21.7	34	56.7	13	21.7	2	3.3	13	21.7	45	75.0	2	3.3	18	30.0	40	66.7	43.486	0.0001*
2-Prepare the environment.	39	65.0	13	21.7	8	13.3	2	3.3	5	8.3	53	88.3	3	5.0	7	11.7	50	83.3	98.967	0.0001*
3-Prepare the woman.	46	76.7	9	15.0	5	8.3	4	6.7	2	3.3	54	90.0	6	10.0	4	6.7	50	83.3	106.095	0.0001*
4-Prepare the nurse.	17	28.3	12	20.0	31	51.7	2	3.3	3	5.0	55	91.7	4	6.7	7	11.7	49	81.7	29.783	0.0001*
5-Take complete history of the woman	38	63.3	18	30.0	4	6.7	4	6.7	15	25.0	41	68.3	4	6.7	17	28.3	39	65.0	81.469	0.0001*
6- Asses the mother's perception of pain.	47	78.3	6	10.0	7	11.7	4	6.7	13	21.7	43	71.7	3	5.0	16	26.7	41	68.3	101.614	0.0001*
7- Assess level of pain.	47	78.3	6	10.0	7	11.7	4	6.7	13	21.7	43	71.7	3	5.0	16	26.7	41	68.3	101.614	0.0001*
8- Assess the physiological responses to L. pain.	41	68.3	13	21.7	6	10.0	3	5.0	2	3.3	55	91.7	3	5.0	9	15.0	48	80.0	107.857	0.0001*
9- Assess the behavioral responses to L. pain.	42	70.0	10	16.7	8	13.3	2	3.3	2	3.3	56	93.3	2	3.3	9	15.0	49	81.7	110.693	0.0001*
10- Ask woman to choose pain relive method from the available options as; acupressure points and epidural analgesia.	43	71.7	9	15.0	8	13.3	2	3.3	2	3.3	56	93.3	1	1.7	6	10.0	53	86.3	116.343	0.0001*
11- Assess the effectiveness of the chosen method.	48	80.0	7	11.7	5	8.3	2	3.3	2	3.3	56	93.3	3	5.0	4	6.7	53	88.3	124.179	0.0001*
12- Perform post procedure tasks.	42	70.0	9	15.0	9	15.0	2	3.3	2	3.3	56	93.3	3	5.0	4	6.7	53	88.3	106.829	0.0001*
Total practice responses (Mean frequency)	39	65.0	11	18.3	10	16.7	3	5.0	5	8.3	52	86.7	6	10.0	8	13.3	46	76.7	88.717	0.0001*

*Statistically significant (P<0.05)

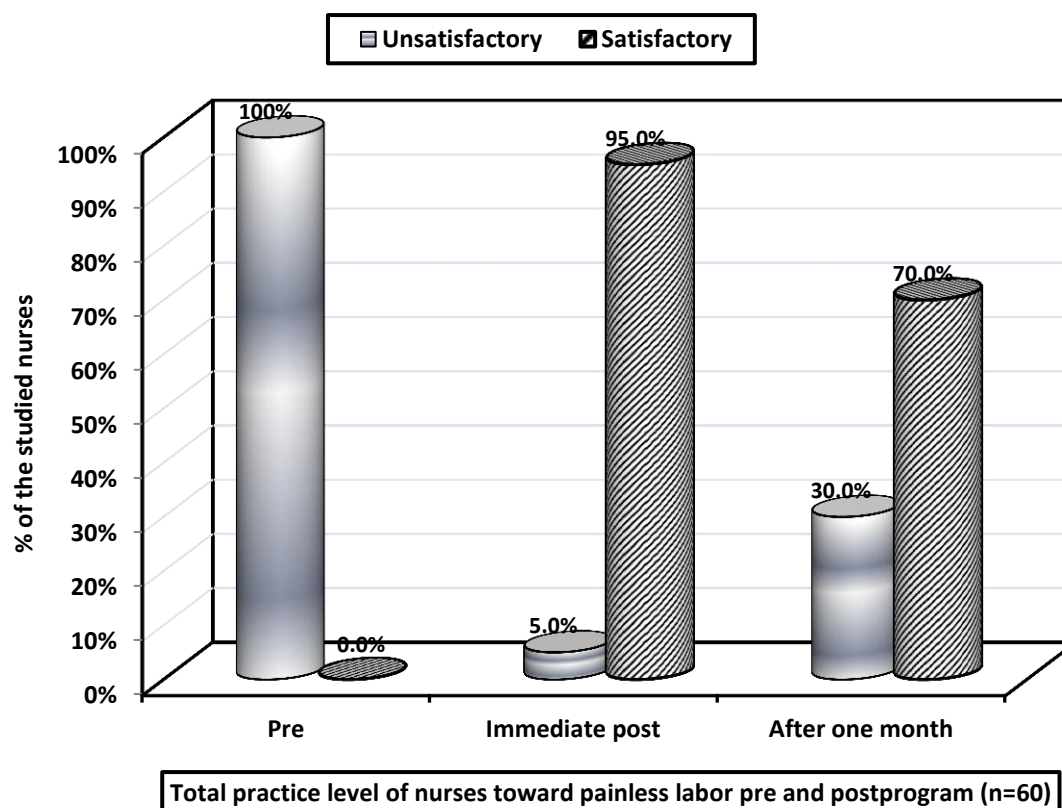


Figure (3): Total practices scores' level of the studied nurses toward painless labor pre and post in-service training program (n=60).

Table (4): Correlation between total knowledge scores, total attitude scores and practice scores among the studied nurses toward painless labor pre and post in-service training program (n=60).

Variables	Total knowledge scores of the studied nurses pre and post in-service training program (n=60)					
	Pre		Immediate post		One month post	
	r	P	r	P	r	P
Total attitude scores	0.213	0.103	0.604	0.0001*	0.310	0.016*
Total practice scores	0.419	0.001*	0.415	0.001*	0.444	0.0001*

*Statistically significant (P<0.05)

r=Correlation Coefficient

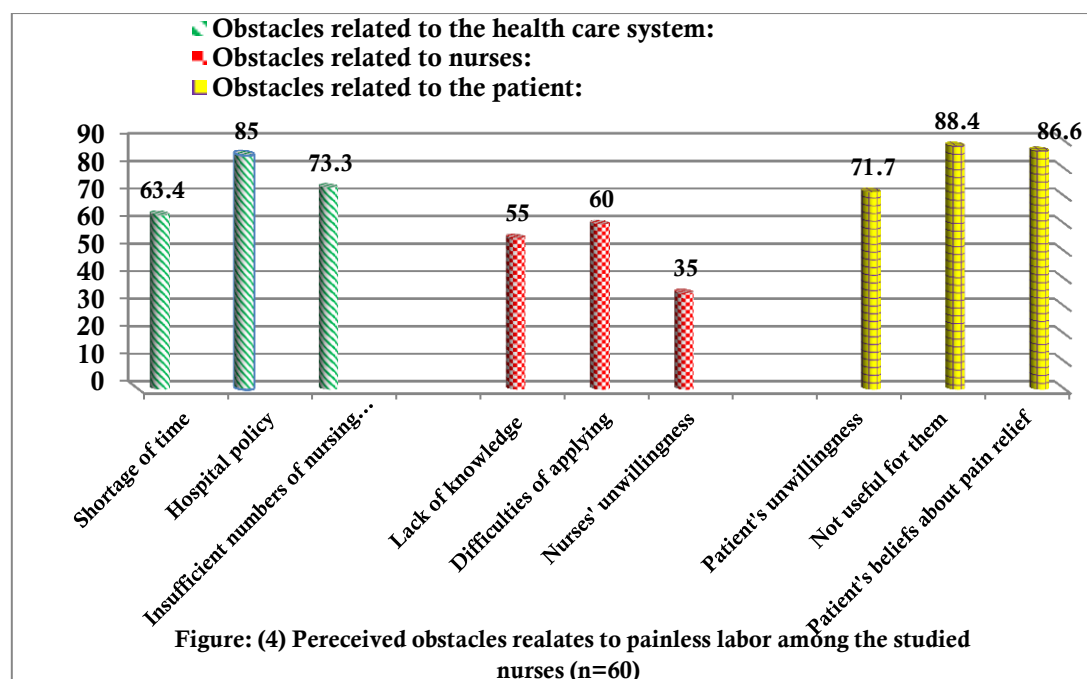


Figure (4): Perceived obstacles related to painless labor among the studied nurses (n=60).

Discussion

Painless labor is currently one of the milestones of current obstetric care and one of the emerging topics in the international health scenario, beyond women's expectations, a care that affects their health without harm and with better birth outcome and maternal wellbeing. ^(33, 34) The present study aimed to determine the effect of an in-service training program among obstetric nurses regarding painless labor in labor units. The results revealed improvement in nurses' knowledge, practice and positive attitude regarding painless labor. This result support study hypothesis "Nurses' knowledge, attitude and practices regarding painless labor may improve after in-service training program". The results of the present study revealed that; the age of the studied nurses ranged from 21-59 years old, with a mean of 27.58 ± 4.58 and more than half of them were divorced. Also, more than half of them had Nursing Technician Diploma with years of experience ranged from 1-15 years, and all studied nurses had no previous training courses regarding painless labor. Early information and knowledge about painless labor can empower women to make informed decisions towards pain management and be prepared for the labor process. This in turn, will reduces their fear and anxiety, promote an easy labor process, increase women's satisfaction with childbirth experience as well as leads to better birth outcome. Hence, nurses employed in prenatal health care setting need to have accurate and up-to-date knowledge regarding painless labor. ^(33,35,36) **In relation to the total score of knowledge regarding painless labor among the studied nurses in the present study, none of the studied**

nurses had high total score of knowledge regarding painless labor before implementation of the in-service training program. **Endalew N et al., (2020)** ⁽¹⁶⁾ conducted a cross sectional study to explore final year midwifery students' knowledge and attitudes towards pain relief during labor, almost more than half of the students were not aware of painless labor. Other researchers add that provision of painless labor methods remains infrequent due to lack of knowledge which is considered to be the main obstacles that prevent women from using these methods especially in developing countries. ^(12, 37)

While, the total score of knowledge in the present study was significantly improved among the majority of them immediately after the sessions and more than four-fifths of them one month after implementation of the in-service training program, with a highly statistically significant difference regarding knowledge about painless labor pre- and post-program. This may be due to effect of the in-service training program. This finding is in line with **Hasan R et al.,(2020)** ⁽³⁸⁾ who mentioned that there is a significant positive correlation between pretest and posttest after the implementation of education program for nurse- midwives regarding knowledge about non-pharmacological management for labor pain. Also, **Rabello R. (2018)** ⁽³⁹⁾ whose study was to incorporate a structured teaching program to educate nurses regarding pain control strategies during labor and to assess its effectiveness, revealed that a majority of the nurses in her study had inadequate knowledge in the pre-test phase but gained a significant amount of knowledge post-test.

Other researchers have investigated the role of intervention programs used within the field of obstetrics. **Abu Hadaf T et al., (2019)⁽⁴⁰⁾** assessed the perception of the graduates of the professional diploma in midwifery educational program regarding the effect of the program on graduates' knowledge, attitudes, and practices (KAP), and found that the participants' level of knowledge increased after completing the program. Also, **Abd El-Razek A(2017)⁽⁴¹⁾**, evaluated the effect of instructional intervention program on obstetrics nurses information and perceptions relating to TENS throughout labor, and found that it was effective and significantly improved nurses' information relating to TENS. **Mahmoud H (2020)⁽⁴²⁾** also found that the educational program was effective in improving nurses' knowledge regarding pain intervention in post-program than before in premature infant. Moreover, **Büyük E (2020)⁽⁴³⁾** whose study aimed to find the effect of video-assisted training given to midwifery and nursing students about pain and its management in newborns on the knowledge level of students, found that students' knowledge increased after the training. Furthermore, other studies were consistent with the current study, which reported that pain education program was effective in improving nurses' pain knowledge.⁽⁴⁴⁻⁴⁶⁾

Regarding the studied nurses' attitudes towards painless labor, nearly two-thirds of them had a positive attitude toward painless labor before program application, The present finding agree with **Ogboli-Nwasor E et al., (2011)⁽⁴⁷⁾** and **Kannan B and Rengasamy C (2017)⁽⁴⁸⁾** findings. On contrast, **Melesse A et al., (2022)⁽³⁷⁾** and **Solomon E et al., (2021)⁽¹²⁾** indicated that

provision of painless labor methods remains infrequent due to poor attitudes among health care providers which are considered to be the main obstacles that prevent women from using pain management methods especially in developing countries. Also, **Endalew N et al., (2020)⁽¹⁶⁾**, mentioned that most participants in there study have shown negative attitude towards labor analgesia before the program, then the attitude was significantly improved to the majority of them immediately post-program and slightly decreased to more than four-fifths one month later with a highly statistically significant difference. This findings is supported by **Abu Hadaf Tet al., (2019)⁽⁴⁰⁾** findings. They found that the graduates of the professional diploma in midwifery educational program s' attitudes become more positive towards caring for clients after completing education program and all items about the perception of the attitude were statistically significant. Also, **Abd El-Razek A (2017)⁽⁴¹⁾**, found that the instructional intervention program for obstetrics nurses was effective and significantly improved nurses' attitudes relating to TENS. These results are also congruent with two other studies that concluded that educational programs are effective means of improving nurses' attitudes.^(49,50) Other studies, reported that a pain education program was effective in improving nurses' pain attitudes toward pain management.⁽⁴⁴⁻⁴⁶⁾

Nowadays, painless labor methods are widely spread in obstetric field and it becomes a corner stone in management of labor pain which are done by trained obstetrician or delegated to the nurses by primary care providers. Therefore, these painless labor methods are one of the primary responsibilities of the maternity

nurses in the current obstetric practice. ⁽⁵¹⁾ **Concerning total score of practices regarding painless labor among the studied nurses**, none of them had satisfactory practices before implementation of the in-service training program, then the total practices score was significantly improved among the majority of them immediately after the sessions and nearly three-quarters of them one month after implementation of the program. This result agrees with **Hasan R et al.,(2020)** ⁽⁵¹⁾ findings. They concluded that the educational program can be considered as an effective mean for improvement of the nurses-midwives' practices about the importance pain management. Also, **Bo S et al.,(2020)** ⁽⁵²⁾ explored the value of mind map in assisting midwife-led labor in pain management and found that it can significantly enhance patients' self-efficacy, reduce cesarean delivery, reduce pain, and improve the quality of life. Moreover, **Abu Hadaf T et al., (2019)** ⁽⁴⁰⁾ found that the most of the graduates of the professional diploma in midwifery educational programs' practices level was higher after completing education program. **Higgins A et al., (2016)** ⁽⁵³⁾ also suggested that prenatal mental health education module was effective in improving the self-reported skills of student midwives towards women with health issues. Furthermore, **Rabello R (2018)** ⁽³⁹⁾ revealed that a majority of the nurses in her study employed poor practices in the pre-test phase but adopted better practices post-test. **Mahmoud H (2020)** ⁽⁴²⁾ found that the educational program was also effective in improving nurses' practices regarding pain intervention in post-program than before in premature infant.

Concerning the correlation between the studied nurses' total score of knowledge with their total score of attitude toward painless labor and the total practices score regarding painless labor, there was a strong positive correlation between them before, immediate and one month after implementation of the in-service training program. These findings are consistent with **Abu Hadaf Tet al., (2019)** ⁽⁴⁰⁾, and **Suchitra J and Lakshmi Devi N(2007)** ⁽⁵⁴⁾, studies which concluded that education has a positive effect on the maintenance of knowledge, attitude and practices in all the categories of employees. These results also agree with **Reis Met al., (2013)** ⁽⁵⁵⁾, findings. They illustrated there are positive relation between knowledge, attitudes and practices among university students in Portugal regarding to contraceptive and transmitted infection.

In relation to **the perceived obstacles related to the application of painless labor among the studied nurses**, the reported barriers were categorized into three; health care system-related, nurse-related and mother-centered barriers. In the health care system-related barriers; hospital policy were perceived as the main obstacles by more than four-fifths of the studied nurses, followed by insufficient staff members and shortage of time among nearly three – quarters and two-thirds of the studied nurses, respectively. These results agree with **Ponnusamy R et al., (2018)** ⁽⁵⁶⁾ who found that obstetricians felt that non availability of anesthesiologist as their main barrier which was similar to **Wassihun B et al.,(2022)** ⁽¹⁴⁾. Similar finding were found in other studies. ^(57,58) Insufficient staff and shortage of time among maternity care providers causes excessive workload and increased

client turnover invariably place a lot of stress on the few practicing nurses and midwives, leading to staff burnout and impaired work efficiency .⁽⁵⁹⁾ **Also, Almushait M, & Abdel Ghani R. (2014)⁽⁶⁰⁾** found that regulatory issues, and lack of time were recorded as the highest barriers among health-care providers regarding non-pharmacological pain relief during labor.

Regarding nurse-related barriers in the current study; two –thirds and more than half of the studied nurses reported that difficulties of applying painless labor methods and lack of knowledge about it are considered the obstacles from their side. While, in the barriers related to mothers; the majority of the studied nurses mentioned that women's beliefs about pain and their thoughts that painless labor methods will be not useful for them, as well as women's unwillingness mentioned by less than three-quarters of them are the most noticed barriers. These findings agree with **Almushait M & Abdel Ghani R. (2014)⁽⁶⁰⁾** findings. Moreover, **Mousa O et al. (2018)⁽³⁰⁾** add that there is an urgent need to identify the barriers against and raise the awareness among the community and health professionals of the need to use pain-relief methods as part of improving the quality of care during labor. Despite the encouragement of public humanization policies, the technocratic model is still present in obstetric care during childbirth. The humanization of obstetric care requires changes in attitudes and care paradigms, in order to guarantee respect and the right to quality care.⁽⁶¹⁾

Conclusion

Application of the in-service training program achieved significant improvement in obstetric nurses' knowledge and practices

related to painless labor as well as it had a positive effect on their attitude. The study also reveals that the major barriers for applying painless labor from nurses' perspective are the hospital policy, insufficient nursing staff, lack of knowledge and difficult of applying it among nurses as well as parous women's believes that pain management methods had no benefits for them.

Recommendations: distribution of the educational booklet for all nurses as well as other health care providers in the obstetric department in order to enhance the awareness about benefits of painless labor. In addition to replication of the program in other geographical areas in Egypt to enhance awareness about of painless labor. Integrating the concept of painless labor in nursing curriculum and hospital policy. The study also suggested equipping obstetric departments with simple illustrated posters covering various non-pharmacological and pharmacological methods of painless labor and distributing them on parous women to gain their attention and co-operation.

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