

# Maternity Nurses Practices Abdominal Examination, Palpation, and Auscultation at First Stage of Normal Labor: An Instructional Package

Hanan Elzeblawy Hassan <sup>1\*</sup>, Amal Ahmed Hassan Omran <sup>2</sup>, Hend Eweis saad <sup>3</sup>, Hanan Amin Ali Gaافر <sup>4</sup>

<sup>1</sup>Professor of Maternal and Newborn Health Nursing, Faculty of Nursing, Beni-Suef University, Egypt.

<sup>2</sup>Professor of Obstetrics & gynecological Nursing, Faculty of Nursing, Benha University, Egypt.

<sup>3</sup>Assistant Lecturer of Maternity & Newborn Health Nursing, Faculty of Nursing, Beni-Suef University, Egypt.

<sup>4</sup>Assistant Professor of Obstetrics & Gynecological Nursing, Faculty of Nursing, Benha University, Egypt.

**\*Corresponding Author:** Hanan Elzeblawy Hassan, Professor of Maternal and Newborn Health Nursing, Faculty of Nursing, Beni-Suef University, Egypt.

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## Abstract

**Background:** Abdominal examination is crucial in the initial assessment of labor, helping to confirm its onset and assess fetal condition, including lie, presentation, and position. The Leopold maneuvers comprise four steps: identifying fetal lie and presentation, locating the fetal spine, assessing engagement of the presenting part, and confirming fetal position by locating the forehead and occiput in the lower abdomen. Aim: evaluate how an instructional package influenced nursing practices in general procedures, abdominal examination, palpation, and auscultation of fetal heart rate during the first stage of normal labor. Subjects and Methods: Design: A quasi-experimental design with a one group pre-posttest. Setting: labor unit at Beni-Suef University and Beni-Suef Specialist Hospitals.

**Sample:** A convenience sample consisting of 50 maternity nurses.

**Tools:** Observational checklist: Part I: checklist used to assess the general practices. Part II: checklist of performing abdominal examination. Part III: The checklist of performing Leopold's maneuvers. Part IV: The checklist of performing auscultation fetal heart rate. Results: 30% of nurses filled out admission card information pre-instruction compared to 80 post-one. Also, 40% of the nurses had position women in a dorso-recumbent position pre-instruction while 80% were done post-one, p value  $\leq 0.001$  for all sub item of abdominal examination. Moreover, 68.0% of nurses did not auscultate fetal heart rate pre-instruction compared to 12.96% post-one. Moreover, it shows that there were highly statistically significant differences for all items of the studied maternity nurses' reported practices regarding performing Leopold's maneuver items at p-value  $\leq 0.001$  between pre- and post-instructional package implementation.

**Conclusion:** There was a significant improvement in maternity nurses' practices concerning nursing care in the first stage of normal labor, covering general practices, fetal heart rate auscultation, abdominal palpation, and post-instruction examination. Recommendations: Implementing a periodic in-service training program aims to enhance maternity nurses' practices for abdominal and vaginal examination, and auscultation of fetal heart rate

**Kew Words:** maternity nurses' practices; first stage of normal labor; abdominal examination; palpation; auscultation, instructional package

## Introduction

Labor is characterized by the rhythmic contraction and relaxation of uterine muscles, leading to cervical effacement and dilatation, and the expulsion of

the fetus and placenta [1-5]. This process can cause physical and mental trauma to both the mother and baby during the intrapartum period [6-10].

Healthcare workers are responsible for managing labor, providing emotional support, and ensuring the health of both mother and child [11-16]. Five factors influencing labor and birth, known as the five Ps, include powers (contractions), passageway (birth canal), passenger (fetus and placenta), position of the mother, and psychological response. The passenger's characteristics are shaped by the fetal head size, presentation, lie, attitude, and position. Notably, the placenta is also considered a passenger in this process [17]. Upon admission for labor, parturient typically undergo a complete blood count, blood type determination, urine analysis, and RH factor testing. High-risk individuals are tested for sexually transmitted infections, such as HIV, hepatitis B and C, syphilis, and group B streptococcus, with some areas requiring these tests for all parturient. A bedside ultrasound may be conducted to confirm fetal position and assess amniotic fluid volume, although this is often unnecessary for low-risk cases evaluated by trained clinicians [18]. Abdominal examination is essential

during the initial assessment to confirm labor, evaluate fetal condition, and determine fetal lie, presentation, position, and estimated fetal size for maternal-fetal compatibility. Presentations include cephalic (vertex, brow, face, mentum) and breech (frank, complete, footling). The position may be designated as "right occiput anterior" (ROA) if the fetal occiput is in the right anterior quadrant of the birth canal [18].

The Leopold maneuvers are a set of four systematic palpation steps of the gravid uterus. The 1st maneuver identifies the fetal lie and presentation by palpating the uterine fundus. The 2nd maneuver locates the fetal spine by palpating the lateral surfaces of the uterus. The 3rd maneuver assesses the engagement of the presenting part through gentle upward pressure above the pubic symphysis. Finally, the 4th maneuver confirms the fetal position by locating the fetal forehead and occiput in the lower abdomen [19].

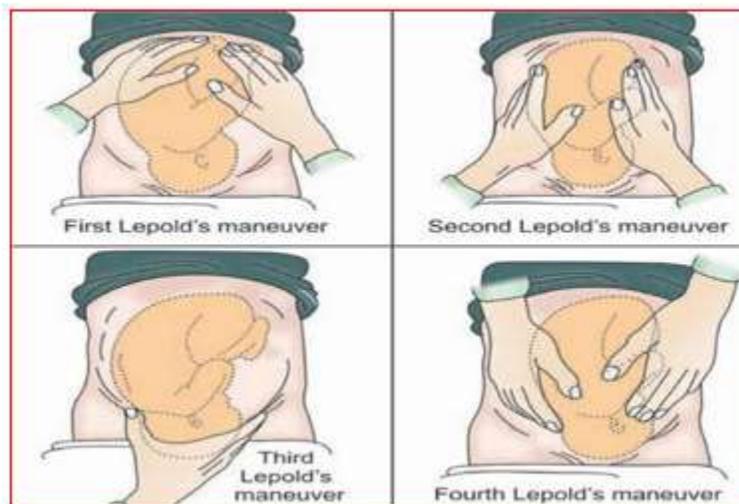


Figure 1: abdominal examination [20].

The FHTs are recorded upon admission and monitored at specified intervals during labor: every 15 minutes in the first stage, 5 minutes during the second stage, and immediately after membrane rupture to detect a prolapsed cord. Intermittent auscultation tracks FHR at least every 30 minutes in active first stage labor and every 15 minutes in the second stage for low-risk pregnancies. [21].

Nursing roles in the health care system are very important; nurses make up the greatest percentage of health care providers assessment of cultural differences is crucial for understanding the diverse attitudes toward childbirth among women from various backgrounds [22-32]. These attitudes, shaped by cultural upbringing, significantly influence childbearing behaviors. Conducting a culture assessment at admission is essential for planning culturally competent care during labor [33].

### Aim Of the Study

The current study aimed to evaluate the effect of the instructional package on nursing practices regarding general practices, abdominal examination, palpation, and auscultation of fetal heart rate during the first stage of normal labor.

### Research Hypothesis

Following the implementation of the instructional package, nursing practices regarding general practices, abdominal examination, palpation, and

auscultation of fetal heart rate during the first stage of normal labor will be competent.

### Subject And Method

#### Research design:

A quasi-experimental study design (one-group pre-posttest) was utilized to evaluate the effect of an instructional package on maternity nurses' general practices, abdominal examination, palpation, and auscultation of fetal heart rate during the first stage of normal labor

#### Settings:

The labor unit at Beni-Suef University Hospital and Beni-Suef Specialist Hospital.

#### Subjects:

A convenience sample of 50 maternity nurses was utilized in the study, comprising 23 nurses from Beni-Suef University Hospital and 27 nurses from Beni-Suef Specialist Hospital.

#### Tools of data collection:

**Observational checklist:** This tool was applied before and after the instructional package sessions to assess the effect of the instructional package on the nurses' competency of practices. This tool was designed by a

researcher, after reviewing the related current and previous literatures to assess the maternity nurses' practices regarding nursing care of the first stage of normal labor.

**Part I:** The checklist consisted of 7 steps, which was used to assess the general practices of maternity nurses regarding nursing care of the first stage of normal labor, such as welcoming and greeting the mother, filling out the admission card information, ensuring privacy, practicing hand hygiene before each procedure, obtaining the history, differentiating between true and false labor pain, and measuring vital signs.

**Part II:** The checklist of performing abdominal examination consisted of 9 steps, which was used to assess the practices of maternity nurses regarding nursing care of the first stage of normal labor (explain procedure, ensure woman empties bladder, provide privacy, position of woman, expose abdomen fully, inspection, Observe abdomen, note shape and contour of abdomen, and note scars & striae gravidarum).

**Part III:** The checklist of performing abdominal palpation (Leopold's maneuver) consisted of 5 maneuvers: Fundal Level, First maneuver (Fundal palpation), Second maneuver (Lateral palpation), Third maneuver (First pelvic Grib), and Fourth maneuver (Second pelvic Grib)

**Part IV:** The checklist of performing auscultation fetal heart rate and finishing examination by return mother to comfortable position, return equipment, and record findings.

#### Practice scoring system:

The scoring for maternity nurses' practice was determined by assigning (1) for completed practices and (0) for those not completed. The total was calculated by summing these scores and dividing by the number of items to obtain a mean score, which was then converted into percentages: competent practice is defined as a total score of 60% or higher, while incompetent practice is below 60%.

#### Tools validity:

Revision of the tools for clarity, relevance, comprehensiveness, understanding, and applicability was done by a panel of expertise composed of five professors of obstetrics and gynecological nursing to measure the content validity of the tools.

#### Reliability of the tools:

The study tools showed strong internal consistency, indicated by Cronbach's Alpha values of 0.926 for practice.

#### Ethical considerations:

Ethical approval for the study was obtained from Benha University's Research Ethics Committee, ensuring privacy and confidentiality, with informed consent provided by participating nurses who were made aware of their right to withdraw at any time.

#### Pilot study:

A pilot study involving 5 nurses, representing 10% of the total sample, was conducted to evaluate the structured questionnaire's clarity, feasibility, applicability, and required time. Data analysis results indicated that some questions needed modifications regarding rewarding correction, omission, and addition in the knowledge section.

#### Field work:

#### Assessment and planning:

The study, conducted from October 2024 to June 2025, involved the researcher attending the study site twice weekly to interview maternity nurses in a private setting. The researcher explained the study's purpose and details to the nurses and assessed their practices related to general care, abdominal examination, and fetal heart rate auscultation during the first stage of normal labor. An instructional package in Arabic, featuring figures and practical skills, was designed based on predetermined educational content and methodologies.

#### Implementation:

General and specific objectives of an instructional package were developed and implemented to meet the needs of a sample of nurses. The package was executed over two practical sessions, each lasting 45-60 minutes, with five groups of approximately ten nurses each. The first session included an orientation on the package, followed by feedback and discussion on the previous session's content. Motivation techniques were employed to encourage engagement, allowing nurses to ask questions and share insights. The first session focused on practical demonstrations such as abdominal examinations, abdominal palpation, and auscultation of fetal heart rate, while the second session involved feedback, re-demonstration of these procedures. Various teaching methods were utilized, including lectures, discussions, multimedia, and hands-on demonstrations, and an instructional booklet was distributed to summarize nursing care methods for the first stage of normal labor.

#### Evaluation

The evaluation phase acts as a post-test, utilizing the same tool as the pretest to assess the impact of an instructional package on maternity nurses' practices during the first stage of normal labor. The researcher used the same tool to compare nurses' practices pre- and post-implementation of the instructional package.

#### III. Administrative approval:

Approval for the study was secured from the Dean of the Faculty of Nursing at Benha University, along with an official letter to the directors of Beni-Suef University Hospital and Beni-Suef Specialist Hospital to obtain informed consent prior to data collection.

#### I- Statistical item:

The data were analyzed using SPSS version 26 with descriptive statistics and significance assessments via chi-square, paired sample t-test, and Pearson correlation coefficient. Significance thresholds were set at P-value >0.05 (not significant), P-value ≤0.05 (statistically significant), and P-value ≤0.01 (highly statistically significant).

#### Results

**Table (1):** Clarifies that there was highly statistically significant improvement for all items of the studied maternity nurses' practices regarding nursing care at the first stage of normal labor in relation to initial assessment at admission (p value ≤0.001) between pre- and post-instruction. In addition, regarding filling out admission card information, a minority of the studied nurses (30%) had done pre- instruction compared to more than three-quarters of the studied nurses (80%) who had done practice at post-instruction. Regarding differentiating between true and false labor pain, it was revealed that more than three-quarters of the studied nurses (76%)

practiced at post- instruction.

**Table (2):** Proves that there were improvements in the studied maternity nurses’ practices regarding abdominal examination pre- and post-instruction. Regarding scars and striae gravidarum, position her in a dorso-recumbent position as her comfort permits. It was reported that 28% and 40% of the studied nurses had done pre- instruction. While 80% & 80% were done post- instruction, p value ≤0.001 for all sub item of abdominal examination.

**Table (3):** Proves that there were improvements in the studied maternity nurses’ practices regarding abdominal examination pre- and post-instruction. It shows that there was a first maneuver and first pelvic grip (32% & 32%) of studied nurses done at pre- instruction. While 72% & 70%

of the studied sample were done at post- instruction. Also, this table illustrates that there were highly statistically significant differences for all items of the studied maternity nurses’ reported practices regarding performing Leopold's maneuver items at a p-value ≤0.001 between pre- and post- instruction.

**Table (4):** Presents that 68.0% of nurses did not auscultate fetal heart rate pre-instruction compared to 12.96% post-instruction. Moreover, it shows that there were highly statistically significant differences for all items of the studied maternity nurses’ reported practices regarding performing Leopold's maneuver items at p-value ≤ 0.001 between pre- and post-instructional package implementation.

Items	Pre- instructional package				Post- instructional package				χ <sup>2</sup>	P-value
	Done		Not done		Done		Not done			
	No.	%	No.	%	No.	%	No.	%		
1- Welcome & greet mother	20	40.0	30	60.0	36	72.0	14	28.0	10.390	<b>0.001**</b>
2- Fill admission card information	15	<b>30.0</b>	35	70.0	40	<b>80.0</b>	10	20.0	25.253	<b>0.000**</b>
3- Ensure privacy	20	40.0	30	60.0	38	76.0	12	24.0	13.300	<b>0.001**</b>
4- Hand hygiene before each procedure	19	38.0	31	62.0	40	80.0	10	20.0	18.231	<b>0.000**</b>
5- Obtain history	23	46.0	27	54.0	38	76.0	12	24.0	9.458	<b>0.002*</b>
6- Differentiate between true & false labor pain	20	40.0	30	60.0	38	<b>76.0</b>	12	24.0	13.300	<b>0.001**</b>
7- Measure vital signs	16	32.0	34	68.0	40	80.0	10	20.0	23.377	<b>0.000**</b>

\*\* A highly statistically significant difference P ≤ 0. 001

**Table 1:** Frequency and percentage distribution of the studied maternity nurses’ general practices regarding nursing care of first stage of normal labor at pre and post-instructional package (n=50)

Items	Pre- instructional package				Post- instructional package				χ <sup>2</sup>	P-value
	Done		Not done		Done		Not done			
	No.	%	No.	%	No.	%	No.	%		
1. Explain procedure to the women.	22	44.0	28	56.0	40	80.0	10	20.0	13.752	<b>0.000**</b>
2. Ensure woman's bladder is empty	19	38.0	31	62.0	40	80.0	10	20.0	18.231	<b>0.000**</b>
3. Provide privacy	16	32.0	34	68.0	36	72.0	14	28.0	16.026	<b>0.000**</b>
4. Position her dorso recumbent position on couch as her comfort permits and knees slightly flexed.	20	<b>40.0</b>	30	60.0	40	<b>80.0</b>	10	20.0	16.667	<b>0.000**</b>
5. Expose abdomen fully, leaving legs & pubic area covered	16	32.0	34	68.0	38	76.0	12	24.0	19.485	<b>0.000**</b>
6. Inspection: Stand on right side of the woman if you are right-handed.	21	42.0	29	58.0	40	80.0	10	20.0	15.174	<b>0.000**</b>
7. Observe abdomen for: Size in relation to period of amenorrhea	18	36.0	32	64.0	37	74.0	13	26.0	14.586	<b>0.000**</b>
8. Note shape and contour of abdomen, shape usually indicates fetal lie.	19	38.0	31	62.0	38	76.0	12	24.0	14.729	<b>0.000**</b>
9. Scars & striae gravidarum, confirm reason for significant scars.	14	<b>28.0</b>	36	72.0	40	<b>80.0</b>	10	20.0	27.214	<b>0.000**</b>

\*\* A highly statistically significant difference P ≤ 0. 001

**Table 2:** Frequency and percentage distribution of the studied maternity nurses’ practices regarding performing abdominal examination at pre and post-instructional package (n=50)

Items	Pre- instructional package				Post- instructional package				χ <sup>2</sup>	P-value
	Done		Not done		Done		Not done			
	No.	%	No.	%	No.	%	No.	%		
Fundal Level	18	36.0	32	64.0	39	78.0	11	22.0	17.21	<b>0.000**</b>
First maneuver (Fundal palpation)	16	<b>32.0</b>	34	68.0	36	<b>72.0</b>	14	28.0	16.02	<b>0.000**</b>

Second maneuver (Lateral palpation)	17	34.0	33	66.0	39	78.0	11	22.0	19.64	<b>0.000**</b>
Third maneuver (First pelvic grib)	16	<b>32.0</b>	34	68.0	35	<b>70.0</b>	15	30.0	14.44	<b>0.000**</b>
Fourth maneuver (Second pelvic grib)	20	40.0	30	60.0	35	70.0	15	30.0	9.091	<b>0.003*</b>

\*\* A highly statistically significant difference  $P \leq 0.001$

**Table 3:** Frequency and percentage distribution of the studied maternity nurses' practices regarding Palpation during pregnancy at pre and post-instructional package (n=50)

Items	Pre- instructional package				Post- instructional package				$\chi^2$	P-value
	Done		Not done		Done		Not done			
	No.	%	No.	%	No.	%	No.	%		
<b>Auscultation:</b> Listen carefully and count for 30- 60 second	16	32.0	34	<b>68.0</b>	34	68.0	16	32.0	<b>12.96</b>	<b>0.000**</b>
Return mother to comfortable position	20	40.0	30	60.0	38	76.0	12	24.0	13.30	<b>0.000**</b>
Return equipment	22	44.0	28	56.0	39	78.0	11	22.0	12.14	<b>0.001**</b>
Record findings	25	50.0	25	50.0	41	82.0	9	18.0	11.40	<b>0.001**</b>

\*\* A highly statistically significant difference  $P \leq 0.001$

**Table 4:** Frequency and percentage distribution of the studied maternity nurses' practices regarding Auscultation, and finishing examination at pre and post-instructional package (n=50)

### Discussion

Respectful maternity care (RMC) is defined as the provision of care that maintains privacy, confidentiality, and dignity that is free from harm or mistreatment while supporting informed choice during labor and birth [34-40]. RMC is a universal human right to be free from harm and mistreatment during the labor and birth process, and providing RMC may help ensure that all women receive equitable maternity care [41]. The current study was conducted to evaluate the effect of the instructional package on nursing practices regarding general practices, abdominal examination, palpation, and auscultation of fetal heart rate during the first stage of normal labor.

Parmar (2021) mentioned that abdominal examination is vital for evaluating fetal status during labor, focusing on fetal lie, presentation, position, and size [18]. Regarding studied maternity nurses' practices abdominal examination at pre and post-instructional package, the present study showed that more than three-quarters of the studied nurses had improvement of practice, such as welcoming and greeting the mother, filling out the admission card information, maintaining privacy, practicing hand hygiene before each procedure, explaining the procedure to the women, ensuring the woman's bladder is empty and putting the mother in a dorso-recumbent position at the post-instructional package.

This finding was agreed with by Ibrahim & Hassan (2022), who studied the "Effect of educational program on maternity nurses' knowledge and practices regarding oxytocin drug administration during labor" and reported that the majority of studied nurses had improvement in practice, such as checking women's names, maintaining privacy, asking women to empty their bladders, explaining procedures to women, hand washing, wearing gloves, and assisting women to lie in suitable positions post educational program [42]. Also, this study is on the same line with Murn (2019), who conducted a study entitled "Mothering the mother: An Educational Program for Nurse-Provided Continuous Labor Support" and found that the majority of the studied nurses had good practice regarding assessment of the mother and labor process during the first stage of labor at posttest [43].

Moreover, Lipsett et al (2023) reported that examination utilizes Leopold maneuvers, involving four steps: assessing lie and presentation, locating the fetal spine, checking engagement of the presenting part, and confirming position through identification of the fetal forehead and occiput [19]. Furthermore, maternity nurses' practices about abdominal examination during nursing care of the first stage of normal labor showed that there was a highly statistically significant difference ( $p < 0.001$ ) between the studied maternity nurses through Leopold's maneuver at the instructional package. These findings agreed with Abdelhameed et al. (2025), who studied the "Effect of educational program on nurses' performance regarding CTG at labor unit" and illustrated that there was a statistically significant difference ( $p < 0.001$ ) in the studied maternity nurses' Leopold's maneuver at the educational program [44].

Concerning maternity nurses' practices regarding auscultation of fetal heart rate at pre and post-instructional package, the results of the present study declare highly statistically improvement in maternity nurses' practices after the instructional package. This in line with American College of Obstetricians and Gynecologists (2020) emphasized that the fetal heart tones should be recorded upon admission and monitored at specified intervals: every 15 minutes during the first stage of labor, every 5 minutes in the second stage, and immediately after membrane rupture. Intermittent auscultation checks fetal heart rate (FHR) every 30 minutes during active first stage labor [21].

Generally, regarding items of practices of nursing care of the first stage of normal labor, the current study shows that the percentages of the studied nurses' post-instructional package implementation and the highly statistically significant improvement of their practices post-implementation of the instructional package. This result of the present study was agreed with by Ahmed et al. (2019), who conducted a study entitled "The impact of a nurse mentoring program on the quality of labor and delivery care at primary health care facilities in Bihar, India" and revealed that there was an improvement in nurses' performance regarding four stages of labor and delivery care [45]. This improvement could be attributed to attending the instructional package; the results indicated that there is progression in nurses' competent

practices as well as a wide variety of educational methods used [46-58]. Additionally, the distributed Arabic booklets also played a crucial role in attaining and retaining knowledge. Booklets are best used when they are brief, written in plain language, and full of good pictures and when they are used to back up other forms of education. This is in accordance with Edgar Dale's or the NTL's Pyramid of Learning as cited by Masters, as the pyramid illustrated that individuals can retain 10.0% of what they read and 20.0% of what they see and hear (audiovisual). The same author added that one can retain 50.0% of what he learned by a discussion [59-75].

Occasionally, this result is supported by Abd-Elrazek et al. (2022) in their titled "Maternity nurses' knowledge and practices regarding evidence-based practice during the care of mothers in the intrapartum period," which reported that there was improvement in maternity nurses' practice of the first stage of labor in the post-test [76]. Also, this finding was in agreement with Murn (2019), who conducted a study entitled "Mothering the Mother: An Educational Program for Nurse-Provided Continuous Labor Support" and found that there was a statistically significant enhancement in nurses' performance during the first stage of normal labor post instructional package [43].

## Conclusion

Based on the findings of the present study, it can be concluded there was highly statistically significant improvement for all items of the studied maternity nurses' practices regarding nursing care at the first stage of normal labor. There were improvements in the studied maternity nurses' practices regarding general, auscultation of fetal heart rate, abdominal palpation, and examination post instructional package.

## Recommendation

- Implementing a periodic in-service training program aims to enhance maternity nurses' practices for abdominal and vaginal examination, and auscultation of fetal heart rate

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