

EFFECTIVENESS OF A SKILL STATION ON KNOWLEDGE AND PRACTICE REGARDING PLACENTAL EXAMINATION AMONG UNDERGRADUATE NURSING STUDENTS: A QUASI EXPERIMENTAL STUDY

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ABSTRACT

Background: Examination of the placenta after delivery is an important component of postnatal assessment. Systematic examination of the placenta, membranes, and umbilical cord can help identify abnormalities and supports appropriate clinical management. Nursing students therefore require both theoretical knowledge and practical competency in placental examination. Skill station-based teaching provides structured opportunities for demonstration, guided practice, return demonstration, and feedback.

Objectives: This study aimed to assess the effectiveness of a skill station on knowledge and practice regarding placental examination among nursing students.

Methods: A quantitative, pre-experimental one-group pretest-posttest design was adopted. Eighty nursing students were selected using simple random sampling. Knowledge was assessed using a self-structured knowledge questionnaire, and practice was assessed using an observational checklist. The skill station included lecture-cum-discussion, demonstration of placental examination, identification of placental structures and abnormalities, guided practice, and return demonstration. Descriptive statistics and paired t-tests were used for analysis.

Results: In the pretest, 73.75% of students had average knowledge and 50% had poor practice. Following the intervention, 61.25% had good knowledge, while 81.25% had average practice, 16.25% had good practice, and 2.5% had excellent practice. The mean knowledge score increased from 8.95 ± 1.46 to 11.78 ± 1.22 ($t = -23.4054$, $df = 79$, $p < 0.0001$). The mean practice score increased from 5.71 ± 2.12 to 11.48 ± 1.75 ($t = -20.9867$, $df = 79$, $p < 0.0001$).

Conclusion: The skill station was associated with statistically significant improvements in knowledge and practice regarding placental examination among the participating nursing students. The findings support the use of structured skill-based teaching within nursing education.

KEYWORDS: Placental examination; Skill station; Nursing students; knowledge, Practice

INTRODUCTION

The placenta is a temporary but vital organ that develops during pregnancy and serves as the interface between the mother and fetus. It plays important roles in the exchange of oxygen, nutrients, and waste products and functions as an endocrine organ essential for maintaining pregnancy¹.

Examination of the placenta after delivery can provide clinically useful information regarding maternal and fetal health and may help identify abnormalities that contributed to adverse pregnancy outcomes^{2,3}. Gross examination can assess the placenta, membranes, and umbilical cord and may identify retained placental tissue, abnormal cord insertion, infarction, calcification, inflammatory changes, and other abnormalities^{2,4}.

Placental examination is therefore relevant to postnatal assessment. A systematic approach requires identification and examination of the maternal and fetal surfaces, membranes, umbilical cord, completeness of the placenta, and visible abnormalities. Appropriate recognition and reporting of abnormal findings are important components of safe clinical practice^{2,4}.

Nurses play an important role in maternal and newborn care. Nursing students consequently need adequate knowledge and practical skills related to placental examination. However, theoretical instruction alone may not provide sufficient opportunity to develop psychomotor competence. Skill stations provide a structured environment in which learners can observe a procedure, practice individual steps, receive feedback, and

demonstrate the skill.

Simulation and skill-based education have been associated with improvements in nursing students' knowledge and clinical competencies^{5,6}. Educational resources using actual or three-dimensional placental specimens have also been described as useful adjuncts for teaching placental anatomy and abnormalities⁷.

Although educational interventions have been studied extensively in nursing, the thesis underlying the present study identified limited research specifically evaluating skill station-based teaching for placental examination among nursing students in the local setting. Therefore, this study was undertaken to assess the effectiveness of a skill station on knowledge and practice regarding placental examination among nursing students.

OBJECTIVES OF THE STUDY

1. To assess the pretest level of knowledge regarding placental examination among nursing students
2. To assess the pre-test level of practice regarding placental examination among nursing students
3. To assess the post-test level of knowledge and practice after the skill development programme
4. To compare pretest and posttest scores of knowledge and practice.

HYPOTHESIS:

H01: There will no significant difference between pre-test and post-test knowledge scores regarding placental examination at $p < 0.05$

H02: There will no significant difference between pre-test and post-test practice scores regarding placental examination at $p < 0.05$

H1: There will be significant difference between pre-test and post-test knowledge scores regarding placental examination at $p < 0.05$

H2: There will be a significant difference between pre-test and post-test practice scores regarding placental examination at $p < 0.05$

MATERIALS AND METHODS

STUDY DESIGN AND SETTING

A quantitative, pre-experimental one-group pretest-posttest research design was used. The design consisted of a pretest assessment (O1), followed by the skill station intervention (X), and a posttest assessment (O2). The study was conducted in selected nursing colleges in the Sangli-Miraj-Kupwad Corporation area of Maharashtra, India.

PARTICIPANTS AND SAMPLING

The target population comprised nursing students studying in nursing colleges, and the accessible population comprised nursing students studying in selected nursing colleges. The sample consisted of 80 nursing students. Simple random sampling was used to select participants.

Students were eligible if they were studying in selected nursing colleges, were available during the data collection period, were willing to provide written informed consent, and could understand and respond to the questionnaire. Students who were absent during data collection or who had previously attended specialized workshops or training regarding placental examination were excluded.

VARIABLES

The independent variable was the skill station regarding placental examination. The dependent variables were knowledge and practice regarding placental examination.

DATA COLLECTION INSTRUMENTS

The data collection tool consisted of three sections. Section A collected demographic information, including age and gender. Section B was a self-structured knowledge questionnaire developed to assess knowledge regarding placental examination. Section C was an observational practice checklist developed to assess students' performance of placental examination.

The study included students aged 22-23 years. In the sample, age and gender were recorded as demographic variables.

VALIDITY AND RELIABILITY

Face and content validity of the research tool were established by fifteen experts. The experts evaluated the appropriateness and adequacy of the tool, after which their recommendations were incorporated and corrections were made. Reliability was assessed using a split-half approach and Karl Pearson correlation coefficient, with a reported reliability coefficient of 0.84.

INTERVENTION

The skill station on placental examination was conducted after the pretest. The intervention included lecture-cum-discussion, demonstration of placental examination, identification of placental structures and abnormalities, guided practice, and return demonstration by the students. Educational materials and necessary equipment were

provided during the session. The intervention was designed to provide structured instruction and controlled practical experience in placental examination.

DATA COLLECTION PROCEDURE

Institutional Ethics Committee approval and permission from the authorities of the selected nursing colleges were obtained before data collection. The purpose and procedure of the study were explained to eligible students, and written informed consent was obtained.

During Phase I, a pretest was administered to assess baseline knowledge and practice. Knowledge was measured using the self-structured questionnaire, and practice was assessed using the observational checklist. During Phase II, the skill station intervention was delivered using lecture-cum-discussion, demonstration, identification of placental structures and abnormalities, guided practice, and return demonstration. During Phase III, a posttest was conducted using the knowledge questionnaire and practice checklist. The source thesis does not specify a fixed numerical interval between the intervention and posttest; therefore, no interval has been added to this manuscript.

ETHICAL CONSIDERATIONS

Ethical approval was obtained from the Institutional Ethics Committee, before commencement of the study. Official permission was obtained from the Principal and class coordinator of the selected nursing colleges. Written informed consent was obtained from all participants. Participants were informed about the purpose and procedures of the study, voluntary participation, anonymity, confidentiality, and their right to withdraw without academic consequences.

STATISTICAL ANALYSIS

Data were coded, tabulated, and analyzed using descriptive and inferential statistics. Frequency and percentage were used for demographic characteristics and categorical levels of knowledge and practice. Mean and standard deviation were used to summarize knowledge and practice scores. Paired t-tests were used to compare pretest and posttest knowledge scores and pretest and posttest practice scores because the same participants were assessed before and after the intervention. Statistical significance was set at $p < 0.05$.

RESULTS

Table 1. Demographic characteristics of participants
n = 80

Variable	Category	n	%
Age (years)	22	65	81.25
	23	15	18.75
Gender	Male	30	37.50
	Female	50	62.50

Pretest knowledge and practice

The study included 80 nursing students. Sixty-five participants (81.25%) were 22 years old and 15 (18.75%) were 23 years old. Fifty participants (62.5%) were female and 30 (37.5%) were male.

Before the intervention, 59 students (73.75%) had average knowledge, 19 (23.75%) had poor knowledge, and two (2.5%) had good knowledge. No participant was classified as excellent or very poor.

For practice, 40 students (50%) had poor practice scores, 38 (47.5%) had average practice scores, and two (2.5%) had good practice scores. No participant was classified as excellent in the pretest.

Table 2. Pretest level of knowledge regarding placental examination
n = 80

Knowledge level	Score range	n	%
Excellent	16-20	0	0
Good	12-15	2	2.50
Average	8-11	59	73.75
Poor	4-7	19	23.75
Very poor	<4	0	0

Table 3. Pretest level of practice regarding placental examination
n = 80

Practice level	Score range	n	%
Excellent	16-20	0	0
Good	10-15	2	2.50
Average	6-9	38	47.50
Poor	<5	40	50.00

Posttest knowledge and practice

Following the skill station, 49 students (61.25%) had good knowledge and 31 (38.75%) had average knowledge. No participant remained in the poor or very poor knowledge categories, and no participant was classified as excellent.

For practice, 65 students (81.25%) had average practice scores, 13 (16.25%) had good practice scores, and two (2.5%) had excellent practice scores. No participant remained in the poor practice category.

Table 4. Posttest level of knowledge regarding placental examination
n = 80

Knowledge level	Score range	n	%
Excellent	16-20	0	0
Good	12-15	49	61.25
Average	8-11	31	38.75
Poor	4-7	0	0
Very poor	<4	0	0

Table 5. Posttest level of practice regarding placental examination
n = 80

Practice level	Score range	n	%
Excellent	16-20	2	2.50
Good	10-15	13	16.25
Average	6-9	65	81.25
Poor	<5	0	0

Comparison of pretest and posttest scores

The mean knowledge score increased from 8.95 ± 1.46 in the pretest to 11.78 ± 1.22 in the posttest. The paired t-test showed a statistically significant difference ($t = -23.4054$, $df = 79$, $p < 0.0001$).

The mean practice score increased from 5.71 ± 2.12 in the pretest to 11.48 ± 1.75 in the posttest. The paired t-test showed a statistically significant difference ($t = -20.9867$, $df = 79$, $p < 0.0001$).

Table 6. Comparison of pretest and posttest knowledge scores using a paired t-test
n = 80

Assessment	Mean	SD	df	t-value	p-value
Pretest	8.95	1.46	79	-23.4054	<0.0001
Posttest	11.78	1.22			

Table 7. Comparison of pretest and posttest practice scores using a paired t-test
n = 80

Assessment	Mean	SD	df	t-value	p-value
Pretest	5.71	2.12	79	-20.9867	<0.0001
Posttest	11.48	1.75			

DISCUSSION

The present study evaluated the effectiveness of a skill station on knowledge and practice regarding placental examination among nursing students. The study included 80 nursing students from selected nursing colleges and used a pre-experimental one-group pretest-posttest design.

The baseline findings showed that knowledge and practice were limited before the intervention. Most students (73.75%) had average knowledge, while 23.75% had poor knowledge and only 2.5% had good knowledge. Similarly, half of the participants had poor practice scores, 47.5% had average practice, and only 2.5% had good practice. These findings indicate a need for structured opportunities to connect theoretical knowledge with practical performance.

Following the skill station, the proportion of students with good knowledge increased to 61.25%, and no student remained in the poor or very poor knowledge categories. The mean knowledge score increased from 8.95 ± 1.46 to 11.78 ± 1.22 , with a statistically significant paired t-test result ($t = -23.4054$, $p < 0.0001$). The improvement is consistent with broader evidence that simulation-based learning can improve nursing students' knowledge and skills^{5,6}.

Practice scores also improved after the intervention. The proportion of students with poor practice decreased from 50% in the pretest to none in the posttest. Although most students remained in the average practice category after the intervention (81.25%), 16.25% achieved good practice and 2.5% achieved excellent practice. The mean practice score increased from 5.71 ± 2.12 to 11.48 ± 1.75 , with a statistically significant paired t-test result ($t = -20.9867$, $p < 0.0001$).

The improvement may be related to the structure of the intervention, which combined explanation, demonstration, identification of placental structures and abnormalities, guided practice, and return demonstration. Such active learning allows students to observe the correct sequence, perform the skill under supervision, and receive feedback. Evidence from nursing simulation research similarly indicates benefits for knowledge, competence, and clinical skill development^{5,6}.

Placental examination itself requires systematic assessment of the placenta, membranes, and umbilical cord. Earlier literature emphasizes that gross examination at delivery can provide clinically useful information and help identify abnormalities that may require further evaluation^{2,3,4}. Educational resources involving physical placental specimens have also been reported as useful for learning placental anatomy and pathology⁷.

The findings should nevertheless be interpreted in light of the study design. Because the study used a single group without a control group, the observed improvement cannot be attributed exclusively to the skill station. Testing effects, additional learning, clinical exposure, or other educational experiences may have contributed to the change. The results therefore demonstrate an association between the intervention and improved scores rather than definitive causal effectiveness.

LIMITATIONS

The study was limited to 80 nursing students from selected nursing colleges. The use of a pre-experimental one-group pretest-posttest design without a control group limits causal inference. The study assessed outcomes within the specified study period and did not evaluate long-term retention of knowledge or practice. The findings may therefore not be generalizable to all nursing students or educational settings.

CONCLUSIONS

The present study found statistically significant improvements in both knowledge and practice regarding placental examination after the skill station intervention among the participating nursing students. The structured combination of explanation, demonstration, guided practice, and return demonstration was associated with higher posttest scores.

These findings support the incorporation of structured skill-based learning opportunities into nursing education for procedures that require both cognitive understanding and psychomotor competency. Future studies using larger samples, control groups, and longer follow-up periods are warranted to examine the reproducibility and retention of these outcomes.

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