International Journal of Science and Research Archive
eISSN: 2582-8185
Cross Ref DOI: 10.30574/ijsra
Journal homepage: https://ijsra.net/

(RESEARCH ARTICLE)

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Effect of a design training program on midwives' knowledge about postnatal care at Al Helal Al Emaraty Maternity Hospital, Gaza Strip – Palestine

Diaa A. Abu Kwaik [1,*], Mohammed J. Nemer [2] and Yousef F. Fahajan [3]

[1] *MoH, Gaza Strip, Palestine.*
[2] *Al Butana university, Khrtoom, Sudan.*
[3] *Univeristy College of Applied Scieneces, Gaza Strip, Palestine.*

International Journal of Science and Research Archive, 2025, 15(01), 1148-1163

Publication history: Received on 26 February 2025; revised on 05 April 2025; accepted on 07 April 2025

Article DOI: https://doi.org/10.30574/ijsra.2025.15.1.0907

Abstract

Having adequate knowledge by midwives about postnatal care is very important for the safety of mother and her baby. **Aim:** The study aimed to evaluate the effectiveness of a designed education program on midwives' knowledge about postnatal care.

Methodology: The study used one group pretest, posttest experimental design. The study used two samples: First sample (convenience) used to assess knowledge by questionnaire included 181 midwives from all the maternity hospitals in GS, and the second sample (census) included all the midwives (76 midwives) who are working in Al Emaraty Maternity Hospital and attended the education program for one month. The researcher collected data in two stages: before the education program (pretest) and after the education program (posttest). The researcher conducted a pilot study on 30 midwives to check validity and reliability of the questionnaire and alpha coefficient was 0.891. The researcher used SPSS version 25 for statistical analysis.

Results: 32.9% of study participants aged less than 30 years, 76.3% of study participants have bachelor degree, 78.9% of study participants are married, 36.8% have an experience of 5 years and less, and 72.4% have an income of 1800 NIS and less. There was statistically significant increase in participants' knowledge about immediate postnatal care after the education program (m= 0.98) compared to knowledge before the educational program (m= 0.93). Also, there was statistically significant increase in participants' knowledge about care provided to the mothers and babies after one hour post-delivery after the education program (m= 0.98) compared to knowledge before the educational program (m= 0.90). Moreover, there was statistically significant increase in participants' knowledge about health education and discharge planning after the education program (m= 0.99) compared to knowledge before the educational program (m= 0.88).

There were statistically no significant differences in knowledge score before and after the education program related to age, level of education, marital status, years of experience, income, and previous training.

Conclusion: The study concluded that the education program successfully enhanced midwives' knowledge in various aspects of postnatal care, contributing to improved maternal and newborn health outcomes.

Recommendations: The study recommended the need for continuous monitoring and evaluation of knowledge levels, which will help identify the training needs and ensure the delivery of high-quality care to mothers and newborns.

Keywords: Postnatal Care; Midwives; Knowledge; Education Program; Gaza Strip; Palestine

* Corresponding author: Diaa Abd Al Raheem Abu Kwaik. Email: Diaaabukwaik@gmail.com

1. Introduction

In the life of a woman, the postnatal phase is critical. In order to demonstrate safe motherhood and healthy living, they need special care during pregnancy, at the time of childbirth, and after childbearing. Improper perception of postnatal health practices often leads the individual to shift towards unsafe motherhood. During the postnatal phase, mothers and newborns are vulnerable to illness and death (Mridha & Koblinsky, 2018).

The main purpose of providing optimal postnatal care is to avert both maternal and neonatal death, as well as long-term complications. To be effective, the midwife therefore needs to know the major causes of death in the postnatal period, so that you can provide quality and timely postnatal care at the domestic and health post level.

The role of midwives in postnatal period includes monitoring the physical condition of both mother and her baby closely, and that need to have qualified midwives who are highly knowledgeable about issues related to postnatal period.

Effective postnatal care can make the difference to the health and life chances of mothers and newborns is in the early neonatal period. The neonatal mortality rate and maternal mortality rate are important indicators of the effectiveness of postnatal care. In Gaza Strip, the maternal mortality rate increased in 2022, reaching to 17 deaths per 100.000 live births (MOH, 2022).

From my experience in maternity hospitals, I noticed that some midwives have inadequate knowledge about the postnatal period, which is a critical period for the mother and her baby. Therefore, the researcher designed and implemented an education program aiming to improve the midwives' knowledge level to improve their ability to identify and recognize mothers and babies who are at risk during the postnatal period.

Aim of the study

This study aimed to evaluate the effectiveness of a designed education program on midwives' knowledge about postnatal care.

2. Literature review

Postnatal care is the care given to the mother and her newborn baby immediately after the birth and for the first six weeks of life (Open Learn Create, 2020). Therefore, having adequate knowledge and awareness about postnatal period plays a major role in early diagnosis, appropriate management and reduction of adverse consequences related postpartum complications (Abd-Elgany et al., 2019). The knowledge of midwives about immediate postnatal maternity and newborn care are vital to reduce maternal and neonatal morbidity and mortality.

A study carried out by Abdu et al. (2019) reported a significant difference in all nursing professional values dimensions namely, caring, activism, trust, professionalism, and over all values, between pre and post program implementation, which indicated that the implemented educational program made a significant improvement on nursing professional values. Also, El-Khawaga et al., (2019) found that the mean knowledge score regarding immediate postnatal care and newborn care was increased immediately after implementation of the program. In addition, Sethi et al. (2019) found that there is a need to improve knowledge of maternal and newborn care guidelines among midwives and nurses in Indonesia, and Olajubu, et al. (2022) reported a significant difference in the mean knowledge score of healthcare workers in the intervention group compared with those in the control group immediately after the training. Moreover, Sami et el. (2017) found that midwives' knowledge on neonatal health increased following a two-days training program. Another study carried out by Shaieb (2020) reported that the majority of midwives were lacking the essential knowledge regarding postnatal infection control measurements and the midwives showed good knowledge after the interventions. Also, Mohemmed et al. (2020) found that the majority of midwives had high knowledge score in the post-test compared with pre-test, and El Saied et al. (2022) found improvement in nurses' knowledge after the implementation of the program such as the nurses had a full understanding of postpartum woman physical, psychosocial and emotional changes.

A study carried out in Japan by Kato & Kataoka (2017) found that knowledge about the management of PPH increased significantly after simulation training. Another study conducted by Bang et al. (2018) found significant increase in knowledge regarding maternal health, family planning & contraceptive use in Ethiopian women.

The effects of socio-demographic factors on midwifery knowledge is of great importance for improving quality of midwifery knowledge and practice. Abd Elrhman Ali et al. (2022) assessed midwives' and nurses' knowledge regarding postpartum period, found that there was statistically significant relation between total knowledge about postpartum period and socio-demographic factors such as job title, education level and years of experience. Also, Yosef et al. (2021) found that the factors associated with good knowledge about EENC was better educational qualification. Whereas, El Shaieb (2022) found that the level of education of the health practitioner affects the level of knowledge, and ability to learn.

3. Methodology

The study used one group pretest, posttest experimental method. The study population included all the registered midwives in governmental maternity hospitals in Gaza Strip. Their total number is about 340 midwives. The researcher used two samples for the study:

First sample (convenience) used to assess knowledge by questionnaire included 181 midwives from all the maternity hospitals in GS.

Second sample (census) included all the midwives who are working in Al Emaraty Maternity Hospital. The researcher collected data from 76 midwives from admission department, delivery department, and post-natal department. The midwives attended the education program for one month.

The study started in February 2021 and completed in March 2024.

3.1. Inclusion criteria

Registered midwives who are working full-time in the maternity hospital for a period of 6 months and more.

3.2. Study tools and instruments

To achieve the objectives of the study, the researcher used knowledge about postnatal care questionnaire. The questionnaire consisted of the following parts:

- Sociodemographic characteristics of study participants.
- Knowledge about immediate postnatal care (first hour after delivery) (23 items)
- Knowledge about care provided to the mother and her baby after one hour post-delivery (33 items)
- Knowledge about health education and discharge planning (12 items)

For the purpose of ensuring validity, the researcher submitted the questionnaire to experts in the field of obstetrics to judge face and content validity. A pilot study was conducted by the researcher on a sample of 30 midwives selected from different maternity hospitals. The reliability was tested using Cronbach's alpha method, and alpha coefficient was 0.891 as presented in the following table.

Table 1 Reliability of the questionnaire (Cronbache alpha method)

Domain	Number of items	Alpha coefficient
Knowledge about immediate postnatal care (first hour after delivery)	23	0.759
Knowledge about care provided to the mother and her baby after one hour post delivery	33	0.831
Knowledge about health education and discharge planning	12	0.775
Total	68	0.891

3.3. Study protocol

- The researcher prepared a primary questionnaire and distributed it to the midwives in the maternity hospitals (181 midwife) to determine the strong and weak points of knowledge among midwives.

- To facilitate implementation of the training program, the researcher divided the midwives into 3 groups (25 participants in group A, 25 participants in group B, 26 participants in group C).
- The education program consisted of power point presentations and simulation dolls for skills part.
- Each group received 6 sessions.
- The education program was implemented by the researcher and two experienced midwives.
- The questionnaires were coded to ensure matching in filling the questionnaires at pretest and posttest.

3.3.1. The study consisted of three stages

- The first stage is pre-intervention: Preparation of the education program and the questionnaire based on the data obtained from the primary questionnaire.
- The second stage is intervention: Implementation of the training program about postnatal care.
- The third stage is posting intervention: including posttest in order to evaluate the effectiveness of the training program (measured by changes in level of knowledge in posttest scores compared to pretest scores).

3.4. Data collection

The researcher collected data with help of three qualified midwives. Matching of the same midwives for the stages of data collection (pretest and posttest) was ensured to get accurate results.

3.5. Data management and statistical analysis

The researcher used SPSS program (version 25) for statistical analysis. The questionnaires were matched for pretest and posttest. The questionnaires were coded, then an entry design had been chosen. Statistical analysis included frequencies, means, percentage, independent sample (t) test, and paired-sample (t) test, and One way ANOVA.

3.6. Ethical consideration

Permission to conduct the study was obtained from Palestinian Ministry of Health and the administration of Al Emaraty Maternity Hospital. Participation in the study was voluntary.

3.7. Limitations of the study

Implementation of the education program was limited to the midwives who are working in Al Emaraty Maternity Hospital, and did not include other hospitals. Also, the study included the registered midwives who are working full-time, while part-time and volunteer midwives were not invited to participate in the study.

4. Results

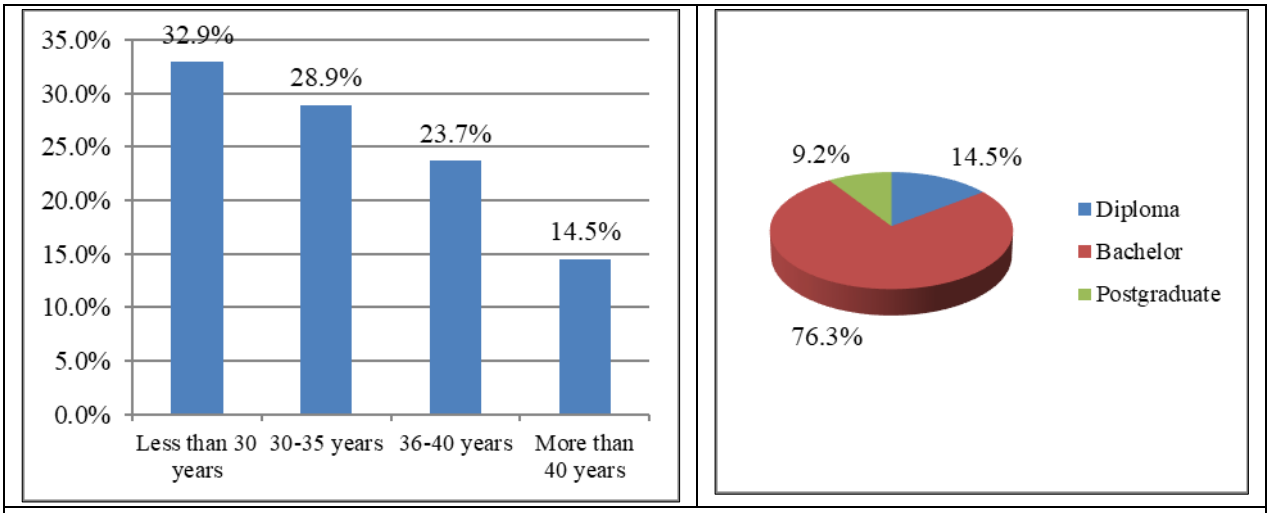

Figure 1 Distribution of study participants by age and academic degree

Figure (1) showed that 25 (32.9%) of study participants aged less than 30 years, and 22 (28.9%) aged 30 – 35 years old, 58 (76.3%) of study participants have bachelor degree, 11 (14.5%) have diploma certificate, and 7 (9.2%) have postgraduate studies (Master degree or PhD).

Table 2 Sociodemographic characteristics of study participants

Variable	Frequency	Percent (%)
Marital status		
Single	13	17.1
Married	60	78.9
Divorced / widow	3	3.9
Total	76	100.0
Experience (m=10.224±7.691 years)		
5 years and less	28	36.8
6 – 10 years	14	18.4
11 – 15 years	21	27.6
16 years and more	13	17.1
Total	76	100.0
Monthly income (m= 1889.66±699.311 NIS)		
1800 NIS and less	55	72.4
More than 1800 NIS*	21	27.6
Total	76	100.0

*NIS= New Israeli Shekel

Table (2) showed that 60 (78.9%) of study participants are married, 13 (17.1%) are single, 28 (36.8%) have an experience of 5 years and less, and 21 (27.6%) have an experience of 11 - 15 years, 55 (72.4%) have an income of 1800 NIS and less.

4.1. Knowledge about postnatal care

Table 3 Knowledge about immediate postnatal care (first hour after delivery)

Domain		**Pre-test**		**Post-test**		**t**	**P value**
Items		**Correct %**	**m(SD)**	**Correct %**	**m(SD)**		
1	I should introduce myself to the mother	96.1	0.96(0.196)	98.7	0.99(0.115)	-1.424	0.159
2	I should congratulate the mother for the new baby	97.4	0.97(0.161)	100.0	1.00(0.000)	-1.424	0.159
3	It is not necessary to ask the mother if she has any complains after birth	86.8	0.87(0.340)	100.0	1.00(0.000)	-3.371	0.001*
4	It is essential to apply the EENC policy for the mother and her baby	94.7	0.95(0.225)	98.7	0.99(0.115)	-1.349	0.181

5	I should keep the baby skin to skin on his mother`s abdomen in the labor room for 90 minutes after birth unless contraindicated	97.4	0.97(0.161)	100.0	1.00(0.000)	-1.424	0.159
6	I should keep the mother and her baby in the labor room for 90 minutes after birth	98.7	0.99(0.115)	100.0	1.00(0.000)	-1.000	0.321
7	I should resuscitate the newborn if he does not breath after 30 seconds after birth	94.7	0.95(0.225)	98.7	0.99(0.115)	-1.349	0.181
8	I should apply the policy of companionship	77.6	0.78(0.419)	89.5	0.89(0.309)	-1.909	0.060
9	It is not necessary to wash hands before and after any procedure with the mother and baby	84.2	0.84(0.367)	100.0	1.00(0.000)	-3.750	0.000
10	It is necessary to follow the policy of waste management according to infection control protocols.	93.4	0.93(0.250)	97.4	0.97(0.161)	-1.136	0.260
11	It is not necessary to measure vital signs every 15 minutes during the first hour postnatal	88.2	0.88(0.325)	100.0	1.00(0.000)	-3.174	0.002
12	I should perform uterus massage every 15 minutes during the first hour postnatal	98.7	0.99(0.115)	98.7	0.99(0.115)	0.000	1.000
13	The follow up in the first hour includes evaluation of vaginal discharge every 15 minutes	97.4	0.97(0.161)	100.0	1.00(0.000)	-1.424	0.159
14	There is no need to assess for symptoms of bleeding every 15 minutes during the first hour postnatal	89.5	0.89(0.309)	100.0	1.00(0.000)	-2.970	0.004
15	I should help the mother to empty bladder every 15 minutes during the first hour postnatal	94.7	0.95(0.225)	100.0	1.00(0.000)	-2.041	0.045
16	I should maintain the baby warm, patent airway, observe color, breathing, and movement.	97.4	0.97(0.161)	98.7	0.99(0.115)	-0.575	0.567
17	There is no need to assess the breast, and any difficulty in breast-feeding	90.8	0.91(0.291)	100.0	1.00(0.000)	-2.758	0.007
18	I should help and encourage the mother to breastfeed her baby after 20 minutes postnatal	89.5	0.89(0.089)	92.1	0.92(0.271)	-0.630	0.531
19	I should help the mother to put on her clothes after birth	90.8	0.91(0.291)	100.0	1.00(0.000)	-2.758	0.007
20	I should discuss with the mother about self-care and personal hygiene especially the perineal area, episiotomy, importance of drinking fluids, and healthy nutrition.	97.4	0.97(0.161)	100.0	1.00(0.000)	-1.424	0.159
21	I should inform the mother about the dangerous symptoms for her and her baby	98.7	0.99(0.115)	100.0	1.00(0.000)	-1.000	0.321
22	There is no need to communicate with the postnatal care department about their readiness to receive the mother and her baby	96.1	0.96(0.196	100.0	1.00(0.000)	-1.756	0.083

23	I should document in mothers' file all the procedures performed, evaluation, and instructions.	97.4	0.97(0.161)	98.7	0.99(0.115)	-0.575	0.567
Total		93.4	0.93(0.092)	98.7	0.98(0.023)	-4.883	0.000

Table (3) showed statistically significant improvement in participants' knowledge about immediate postnatal care after the education program compared to knowledge before the educational program. The overall mean score of knowledge was at pre-test 0.93, increased to 0.98 at post-test, (t= -4.883, P= 0.000).

Table 4 Knowledge about care provided to the mother and her baby after one hour post delivery

Domain		**Pre-test**		**Post-test**		**t**	**P value**
Items		**Correct %**	**m(SD)**	**Correct %**	**m(SD)**		
1	There is no need to keep the baby skin to skin on his mother`s abdomen or chest in the labor room for 90 minutes after birth	93.4	0.93(0.250)	100.0	1.00(0.000)	-2.298	0.024
2	There is no need to assess every baby after separation from his mother after 90 minutes after birth	94.7	0.95(0.225)	100.0	1.00(0.000)	-2.041	0.045
3	There is no need to put identification bracelet for all the babies after birth	94.7	0.95(0.225)	100.0	1.00(0.000)	-2.041	0.045
4	It is necessary to give every baby vit. K injection after birth	100.0	1.00(0.000)	100.0	1.00(0.000)	0	0
5	All the babies should be weighed after birth	97.4	0.97(0.161)	96.1	0.96(0.196)	0.445	0.658
6	There is no need to measure the length of the babies after birth	92.1	0.92(0.271)	100.0	1.00(0.000)	-2.535	0.013
7	There is no need to measure the head circumference of the babies after birth	89.5	0.89(0.309)	100.0	1.00(0.000)	-2.970	0.004
8	There is no need to measure the chest circumference of the babies after birth	81.6	0.82(0.390)	100.0	1.00(0.000)	-4.115	0.000
9	The policy of transfer includes transferring the mother and her babies on wheelchair from the labor room to the postnatal department after 90 minutes	80.3	0.80(0.401)	96.1	0.96(0.196)	-3.174	0.002
10	There is no need to use ISBAR for hand-over of all the cases	85.5	0.86(0.354)	100.0	1.00(0.000)	-3.563	0.001
11	The baby should be assessed by the receiving midwife in the postnatal department (mother's name, file number, gender of baby, date and time of birth, umbilicus)	92.1	0.92(0.271)	97.4	0.97(0.161)	-1.651	0.103
12	There is no need to orient the mother to the department (bathroom, nursing station, kitchen)	86.8	0.87(0.340)	100.0	1.00(0.000)	-3.371	0.001

13	I should continue checking vital signs every hour for 6 hours after birth	94.7	0.95(0.225)	100.0	1.00(0.000)	-2.041	0.045
14	There is no need to massage the uterus and evaluate its contraction evry hour for 6 hours after birth	97.4	0.97(0.161)	100.0	1.00(0.000)	-1.424	0.159
15	I should continue assessing vaginal discharge for 6 hours after birth	97.4	0.97(0.161)	100.0	1.00(0.000)	-1.424	0.159
16	I should maintain the baby warm, patent airway, color, breathing, and activity	100.0	1.00(0.000)	100.0	1.00(0.000)	0.000	1.000
17	It is not necessary to assess for bleeding every hour during 6 hours after birth	96.1	0.96(0.196)	100.0	1.00(0.000)	-1.756	0.083
18	I should encourage the mother to go to the toilet every hour during 6 hours after birth (to maintain empty bladder)	96.1	0.96(0.196)	98.7	0.99(0.115)	-1.000	0.321
19	The first amount of voided urine should be recorded in the mother's file	81.6	0.82(0.390)	97.4	0.97(0.161)	-3.426	0.001
20	The site of episiotomy should be assessed every 6 hours	86.8	0.87(0.340)	98.7	0.99(0.115)	-2.837	0.006
21	There is no need for the neonatologist rounds and filling the assessment form	94.7	0.95(0.225)	100.0	1.00(0.000)	-2.041	0.045
22	The midwife should assess the umbilicus every shift	86.8	0.87(0.340)	98.7	0.99(0.115)	-2.837	0.006
23	The follow up should include making sure that the baby passed urine	92.1	0.92(0.271)	100.0	1.00(0.000)	-2.535	0.013
24	The follow up should include patency of anus	97.4	0.97(0.161)	98.7	0.99(0.115)	-0.575	0.567
25	There is a need to identify the gender of the baby	98.7	0.99(0.115)	98.7	0.99(0.115)	0.000	1.000
26	The follow up should include assessment of the spine for deformities	75.0	0.75(0.436)	94.7	0.95(0.225)	-3.508	0.001
27	The midwife make sure that the identification bracelet is present every shift and before discharge (gender, color, …)	94.7	0.95(0.225)	100.0	1.00(0.000)	-2.041	0.045
28	I should help mothers to take a shower after birth if she wants so	61.8	0.62(0.489)	90.8	0.91(0.291)	-4.496	0.000
29	The midwife should assess the mother's breast every shift (for cracks, ulcerations, congestion)	77.6	0.78(0.419)	94.7	0.95(0.225)	-3.153	0.002
30	There is no need to help or encouraging mother about natural breastfeeding	93.4	0.93(0.250)	100.0	1.00(0.000)	-2.298	0.024
31	The blood group should be checked for the mother and her baby and give anti-D if needed	98.7	0.99(0.115)	98.7	0.99(0.115)	0.000	1.000
32	There is no need to talk with family about their role in psychological support of mothers after birth	86.8	0.87(0.340)	100.0	1.00(0.000)	-3.371	0.001

33	Every procedure and activity should be documented well in the file	98.7	0.99(0.115)	98.7	0.99(0.115)	0.000	1.000
Total		90.7	0.90(0.105)	98.7	0.98(0.025)	-6.380	0.000

Table (4) showed statistically significant improvement in participants' knowledge about care provided to the mothers and babies after one hour post-delivery after the education program compared to knowledge before the educational program. The overall mean knowledge was at pre-test 0.90 increased to 0.98 at post-test, (t= -6.380, P= 0.000).

Table 5 Knowledge about health education and discharge planning

Domain		**Pre-test**		**Post-test**		**t**	**P value**
Items		**Correct %**	**m(SD)**	**Correct %**	**m(SD)**		
1	The midwife should teach and counsel the mother about self-care and hygiene	100.0	1.00(0.000)	100.0	1.00(0.000)	0	0
2	There is no need to teach and instruct the mother about care of episiotomy	85.5	0.86(0.354)	100.0	1.00(0.000)	-3.563	0.001
3	The midwife should teach and counsel the mother about balanced diet	97.4	0.97(0.161)	100.0	1.00(0.000)	-1.424	0.159
4	The midwife should instruct the mother about taking iron tablets when needed	94.7	0.95(0.225)	98.7	0.99(0.115)	-1.349	0.181
5	The discharge plan does not include instructions for the mother about rest and exercise after birth	85.5	0.86(0.354)	100.0	1.00(0.000)	-3.563	0.001
6	The midwife should teach and counsel the mother about dangerous symptoms for the mother and her baby	93.4	0.93(0.250)	98.7	0.99(0.115)	-1.651	0.103
7	The midwife should teach and counsel the mother about natural breast-feeding	98.7	0.99(0.115)	100.0	1.00(0.000)	-1.000	0.321
8	There is no need to teach and instruct the mother about care of her baby including examination of thyroid gland, PKU, and vaccination	81.6	0.82(0.390)	100.0	1.00(0.000)	-4.115	0.000
9	There is no need to teach and instruct the mother about movement and family planning	75.0	0.75(0.436)	100.0	1.00(0.000)	-5.000	0.000
10	There is no need to teach and instruct the mother about sexual activity	69.7	0.70(0.462)	100.0	1.00(0.000)	-5.705	0.000
11	There is no need to inform the mother about visiting the primary health care center for postnatal care	84.2	0.84(0.367)	100.0	1.00(0.000)	-3.750	0.000
12	The midwife should document the counselling and discharge plan in the file	93.4	0.93(0.250)	98.7	0.99(0.115)	-1.651	0.103
Total		88.2	0.88(0.144)	99.6	0.99(0.016)	-6.758	0.000

Table (5) showed statistically significant improvement in participants' knowledge about health education and discharge planning after the education program compared to knowledge before the educational program. The overall mean knowledge was at pre-test 0.88, increased to 0.99 at post-test, (t= -6.758, P= 0.000).

4.2. Effectiveness of the educational program on knowledge about postnatal care

To determine the effectiveness of the educational program, the researcher used paired sample (t) test to find the significance of the differences in scores before and after implementation of the program, then the researcher calculated the percentage change in scores between pre-test and post-test for each variable.

Table 6 Overall changes in knowledge of midwives about postnatal care

Variable	Pre-test m(SD)	Post-test m(SD)	Mean Diff. (95% CI) (Pre - Post)	t-(df)	p value	Change %
Change in knowledge about postnatal care (first hour post-delivery)	0.93(0.092)	0.98(0.023)	-0.053 (-0.075, -0.031)	-4.883 (75)	<0.001	5.37
Change in knowledge about postnatal care (after one hour post-delivery)	0.90(0.105)	0.98(0.025)	-0.079 (-0.104, -0.054)	-6.380 (75)	<0.001	8.88
Change in knowledge about health education and discharge planning	0.88(0.144)	0.99(0.016)	-0.114 (-0.147, -0.080)	-6.758 (75)	<0.001	12.50
Overall change in knowledge About post-natal care	0.91(0.095)	0.98(0.015)	-0.077 (-0.099, -0.054)	-6.940 (75)	<0.001	7.69

Table (6) showed that there was statistically significant improvement in the overall knowledge of midwives about postnatal care after attending the program compared to knowledge before the program. The overall mean knowledge at pre-test and at post-test was 0.91 and 0.98 respectively (p= <0.001) with a percent change of 7.69%. There were statistically no significant differences in knowledge score before and after the education program related to age (P= 0.475 and 0.318 respectively), level of education (P= 0.336 and 0.320 respectively), marital status (P= 0.497 and 0.411 respectively), years of experience (P= 0.378 and 0.459 respectively), income (P= 0.415 and 0.594 respectively), and previous training (P= 0.591 and 0.582 respectively).

5. Discussion

This study utilized a one group experimental, interventional design. The study aimed to evaluate the effectiveness of a designed training program among midwives' knowledge about postnatal care in Al Helal Al Emaraty Maternity Hospital.

Initially, a need assessment was carried out including 181 midwives from the governmental maternity hospitals in Gaza Strip. The number of midwives who were recruited and attended the education program was 76 midwives working at Al Helal Al Emaraty Maternity Hospital.

The need assessment showed that about two-thirds of midwives (66.3%) stated that they did not have previous training about postnatal care. Furthermore, 75% of midwives did not attend any previous training about postnatal care.

5.1. Knowledge about immediate postnatal care (first hour after delivery)

The total correct percentage score increased from 93.4% in the pre-test to 98.7% in the post-test, showing an overall improvement in knowledge about immediate postnatal care after the intervention. It is obvious that improved knowledge is likely to have positive implications for the quality of care provided to mothers and newborns during the crucial postnatal period.

This result was similar to the results of Youssef et al. (2021) which reflected that the majority of respondents had good knowledge, and the factors associated with good knowledge were better educational qualification. In addition, this result agreed with the results of Khdir & Abdul-sahib (2018) which concluded that overall knowledge of the nurses and midwives regarding basic postpartum care where acceptable.

Furthermore, Wang et al. (2023) found that breastfeeding training programs significantly improved midwives' breastfeeding-related knowledge. Also, the results were consistent with the results of Shaieb (2020) which proved that the level of midwives' knowledge improved significantly after guidelines interventions, concerning definition of postnatal sepsis, hand hygiene, particularly perineal and vulval care compared to pre-intervention phase.

Moreover, the results of this study were consistent of Abd El-Maqsoud et al. (2023) study which indicated that there was obviously significant improvement of midwives and nurses' knowledge regarding infection prevention during postpartum period immediately after implementation of the educational program.

5.2. Knowledge about care provided to the mother and her baby after one hour post delivery

The result of the study reflected a significant increase in knowledge, indicating a shift towards recognizing the importance of keeping the baby skin-to-skin contact with the mother immediately after birth till 90 minutes. Similarly, there's an evident improvement in understanding the necessity of assessing babies after separation from the mother, indicating a better understanding of postnatal care guidelines. Understanding the importance of using ISBAR for hand-over of cases and orienting the mother to the department also shows improvement. There's a recognition of the importance of follow-up care, including ensuring the baby passes urine and assessing the spine for deformities. Understanding the need for proper identification (using bracelets) for babies and documenting their details is recognized. Overall, there was a significant improvement in midwives' knowledge about postnatal care for mothers and babies. This improved knowledge can potentially lead to better health outcomes for both mothers and babies.

These results were consistent with the results of El Saied et al. (2023) which concluded that using the shift work reporting method had a significant effect among the study participants using identification, situation, background, assessment, and recommendation tool and improved their knowledge, practice and perception of shift hand-off communication.

These results were similar with the results of Akinbowale et al. (2023) which showed that there was an increase in the level of knowledge of participants on care of the newborn as compared to the pre intervention level of knowledge and practice, immediate post intervention and one month post intervention among the experimental group.

5.3. Knowledge about discharge planning

The results indicated a significant increase in correct answers for items such as care of episiotomy, rest and exercise after birth, care of the baby including examinations and vaccinations, movement and family planning, sexual activity, and visiting the primary health care center for postnatal care indicates that the health education and discharge planning intervention were effective in enhancing knowledge in these areas.

Also, the results showed significant improvements in various aspects of health education and discharge planning. Teaching and counseling on self-care and hygiene, care of episiotomy, balanced diet and fluids, dangerous symptoms, natural breastfeeding, and postnatal care visits; all exhibited significant improvements. Instruction regarding taking iron tablets when needed and documenting counseling and discharge plans also showed substantial enhancements. These results were consistent with the result of Bang et al. (2018) which indicated that effective training improved knowledge regarding maternal health and family planning in Ethiopia.

6. Conclusion

The results indicated that the program successfully enhanced midwives' knowledge in various aspects of postnatal care, contributing to improved maternal and newborn health outcomes. Further research could explore the long-term impact of such training programs and assess their sustainability in maintaining improved skills over time. Additionally, qualitative studies could provide insights into midwives' experiences and perceptions of the training program, identifying areas for further improvement

The study indicated that participants from different ages, level of education, years of experience, and income showed approximate improvement in knowledge after the education program. This highlights the importance of continuous education initiatives and in-service training to ensure the consistent delivery of high-quality care across all participants.

The program was effective in improving knowledge level among midwives.

Future aspects

Further research could explore the specific components of the training program that were most effective in improving knowledge levels among midwives.

Continuous evaluation and refinement of education programs may be necessary to ensure ongoing improvement in postnatal care practices among healthcare providers.

The study recommended the need for continuous monitoring and evaluation of knowledge levels, which will help identify the training needs and ensure the delivery of high-quality care to mothers and newborns.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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Appendix

Table Knowledge about postnatal care Questionnaire

Age:	**…….. years**
Level of education:	⇒ Diploma ⇒ Bachelor ⇒ Postgraduate
Marital status:	⇒ Single ⇒ Married ⇒ Divorced / widow
Experience:	…….. years
Monthly income:	…….. NIS
Received previous training:	⇒ Yes ⇒ No
Was the training adequate?	⇒ Adequate ⇒ Inadequate
Working shifts	⇒ Morning ⇒ Rotation (evening and night)

Table Knowledge about immediate postnatal care (first hour after delivery)

Items		**Correct**	**Incorrect**
1	I should introduce myself to the mother		
2	I should congratulate the mother for the new baby		
3	It is not necessary to ask the mother if she has any complains after birth		
4	It is essential to apply the EENC policy for the mother and her baby		
5	I should keep the baby skin to skin on his mother`s abdomen in the labor room for 90 minutes after birth unless contraindicated		
6	I should keep the mother and her baby in the labor room for 90 minutes after birth		
7	I should resuscitate the newborn if he does not breath after 30 seconds after birth		
8	I should apply the policy of companionship		
9	It is not necessary to wash hands before and after any procedure with the mother and baby		
10	It is necessary to follow the policy of waste management according to infection control protocols.		

11	It is not necessary to measure vital signs every 15 minutes during the first hour postnatal		
12	I should perform uterus massage every 15 minutes during the first hour postnatal		
13	The follow up in the first hour includes evaluation of vaginal discharge every 15 minutes		
14	There is no need to assess for symptoms of bleeding every 15 minutes during the first hour postnatal		
15	I should help the mother to empty bladder every 15 minutes during the first hour postnatal		
16	I should maintain the baby warm, patent airway, observe color, breathing, and movement.		
17	There is no need to assess the breast, and any difficulty in breast-feeding		
18	I should help and encourage the mother to breastfeed her baby after 20 minutes postnatal		
19	I should help the mother to put on her clothes after birth		
20	I should discuss with the mother about self-care and personal hygiene especially the perineal area, episiotomy, importance of drinking fluids, and healthy nutrition.		
21	I should inform the mother about the dangerous symptoms for her and her baby		
22	There is no need to communicate with the postnatal care department about their readiness to receive the mother and her baby		
23	I should document in mothers' file all the procedures performed, evaluation, and instructions.		

Table Knowledge about care provided to the mother and her baby after one hour post delivery

Items		**Correct**	**Incorrect**
1	There is no need to keep the baby skin to skin on his mother`s abdomen or chest in the labor room for 90 minutes after birth		
2	There is no need to assess every baby after separation from his mother after 90 minutes after birth		
3	There is no need to put identification bracelet for all the babies after birth		
4	It is necessary to give every baby vit. K injection after birth		
5	All the babies should be weighed after birth		
6	There is no need to measure the length of the babies after birth		
7	There is no need to measure the head circumference of the babies after birth		
8	There is no need to measure the chest circumference of the babies after birth		
9	The policy of transfer includes transferring the mother and her babies on wheelchair from the labor room to the postnatal department after 90 minutes		
10	There is no need to use ISBAR for hand-over of all the cases		
11	The baby should be assessed by the receiving midwife in the postnatal department (mother's name, file number, gender of baby, date and time of birth, umbilicus)		
12	There is no need to orient the mother to the department (bathroom, nursing station, kitchen)		

13	I should continue checking vital signs every hour for 6 hours after birth		
14	There is no need to massage the uterus and evaluate its contraction evry hour for 6 hours after birth		
15	I should continue assessing vaginal discharge for 6 hours after birth		
16	I should maintain the baby warm, patent airway, color, breathing, and activity		
17	It is not necessary to assess for bleeding every hour during 6 hours after birth		
18	I should encourage the mother to go to the toilet every hour during 6 hours after birth (to maintain empty bladder)		
19	The first amount of voided urine should be recorded in the mother's file		
20	The site of episiotomy should be assessed every 6 hours		
21	There is no need for the neonatologist rounds and filling the assessment form		
22	The midwife should assess the umbilicus every shift		
23	The follow up should include making sure that the baby passed urine		
24	The follow up should include patency of anus		
25	There is a need to identify the gender of the baby		
26	The follow up should include assessment of the spine for deformities		
27	The midwife makes sure that the identification bracelet is present every shift and before discharge (gender, color, …)		
28	I should help mothers to take a shower after birth if she wants so		
29	The midwife should assess the mother's breast every shift (for cracks, ulcerations, congestion)		
30	There is no need to help or encouraging mother about natural breastfeeding		
31	The blood group should be checked for the mother and her baby and give anti-D if needed		
32	There is no need to talk with family about their role in psychological support of mothers after birth		
33	Every procedure and activity should be documented well in the file		
Total			

Table Knowledge about health education and discharge planning

Items		**Correct**	**Incorrect**
1	The midwife should teach and counsel the mother about self-care and hygiene		
2	There is no need to teach and instruct the mother about care of episiotomy		
3	The midwife should teach and counsel the mother about balanced diet		
4	The midwife should instruct the mother about taking iron tablets when needed		
5	The discharge plan does not include instructions for the mother about rest and exercise after birth		
6	The midwife should teach and counsel the mother about dangerous symptoms for the mother and her baby		
7	The midwife should teach and counsel the mother about natural breast-feeding		

8	There is no need to teach and instruct the mother about care of her baby including examination of thyroid gland, PKU, and vaccination		
9	There is no need to teach and instruct the mother about movement and family planning		
10	There is no need to teach and instruct the mother about sexual activity		
11	There is no need to inform the mother about visiting the primary health care center for postnatal care		
12	The midwife should document the counselling and discharge plan in the file		
Total			