Impact of Health Educational Program for Pregnant Women on their Selected Postpartum and Newborn Care

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Abstract

Background: Mother and newborns are incredibly susceptible during the post-natal period, which is also characterized by high rates of sickness and mortality. Knowledge of post-natal care plays a crucial role in preventing these problems. **Aim of the study:** to evaluate the impact of health educational program for pregnant women on their selected post-partum and newborn care. **Research design**: quasi-experimental research design (one group pre-test, post-test) was used to fulfill the aim of this study. **Sample:** A purposive sample composed of 70 pregnant women was used in this research. **Tool of data collection:** three tools were used: Tool (I): an interviewing questionnaire. **Tool (II)**: pregnant women's knowledge about post-partum and newborn care, **Tool (III)** observational checklist regarding post-partum and newborn care. **Results:** The findings of this study revealed that (75.70%) of the studied sample had poor knowledge level before the implementation of the educational program, while (90.00 %) of the study sample had good knowledge immediately after the implementation of the educational program and slightly decreased to (85.70%) in the first day post-partum with highly statistically significant differences which P-value $\leq 0.0001**$, in addition, the results illustrated a significant improvement in total practice regarding post-partum and newborn care among pregnant women in post-test as compared to pre-test (P-value ≤ 0.0001). **Conclusion:** This study concluded that implementing the health education program effectively improved pregnant women's overall knowledge and practice towards post-partum and newborn care. **Recommendation:** Regular training programs to educate pregnant women, especially primigravida, to improve their knowledge and practice about post-partum and newborn care, which can reduce maternal and newborn morbidity and mortality.

Keywords: health educational program, post-partum care, newborn care.

Introduction

Physiologically and psychologically, the postpartum period is a vital transitioning time for the mother, the infant, and the family. The postpartum phase, or puerperium, begins after the placenta is delivered and lasts for around six weeks. The fourth trimester is a common term for this time of pregnancy. By the sixth week after giving birth, the woman's body has mostly returned to its pre-pregnancy condition. However, the post-partum period can also be thought of as the year after the birth of a child and all the changes it brings to the mother's life. The fourth trimester may be the longest because some people believe the postpartum adjustment period lasts for the better part of the first year. Because of this, the actual postpartum phase can extend anywhere from 9 to 12 months as the woman's body returns to its pre-pregnancy form, she psychologically adjusts to the changes in her life, and she assumes her new position as mother. **(Andrews&Boyle, 2019).**

During the post-natal phase, care focuses on fostering the baby's attachment to his or her parents and other family members as well as ensuring the mother's physical health. Furthermore, it may aid in the development of infant feeding skills and increase the mother's self-awareness and confidence in her ability to care for her child's health and well-being. As a result, knowing about post-natal care aids mothers in learning how to parent effectively so that they may fulfill their role as mothers in their unique families. **(Beraki et al., 2020).**

A mother's knowledge and confidence in her ability to care for herself and her newborn, particularly after discharge from the hospital, is highly valued. During her hospital stay, the mother's confidence may be enhanced by the knowledge she receives from her registered midwife or staff nurse and physician on self-care for the mother and newborn care. Inadequate healthcare for new mothers can force them to rely on informal networks for their post-natal care education, such as friends and family. Therefore, during the post-natal stage, the woman needs a specialized education on post-natal care. Protection for both mother and fetus during pregnancy and childbirth **(Milroy & Frayne, 2022).**

Pregnant women should get antenatal education in order to lessen the risk that they may experience difficulties during their pregnancies, deliveries, and postpartum recoveries. Pregnant women should receive all the information they need from the maternity nurse regarding pregnancy, labor, and postpartum care throughout the antenatal period. During the third trimester of pregnancy, women should be given information regarding the puerperium, nursing methods, and breast care for lactating mothers. So, there is a need for an educational program; this will help the mothers to gain awareness and helps to avoid traditional practices. **(Hassan et al. 2020).**

Significance of the study:

The postpartum period is a difficult time for mothers on many levels. The mother also needs knowledge about newborn health and care practices. As a result, the mother requires increased medical, educational, and assistance programs. There is still a great gap in maternal mortality rates between developing and developed countries, with 99 percent of all maternal deaths occurring in the latter. Comparatively, developed countries have an MMR that is only one-ninth of

what it is in developing countries, where the rate is 19 times higher. **(WHO, 2020).**

The estimated Maternal Mortality Rate (MMR) is 440 per 100,000 live births in developing countries, with 64 countries reporting an estimate above 500 per 100,000 live births. Only 11–17% of these deaths occur during labor and delivery, whereas the remaining 50–71% occur in the postpartum period. Most postpartum deaths happen in the first week following giving birth, and many of these deaths are preventable if proper precautions are taken and resources are made available. **(El-Khawaga et al., 2019).**

The neonatal phase (the first 28 days of infant existence) is the most dangerous time for the baby's survival. The global infant mortality rate decreased by 52 percent, from 38 per 1,000 live births in 1990, to 17 in 2019. The rate is highest in the first month of life. **(Neonatal mortality rate, 2019).** On a global level, it is estimated that 2.5 million newborns do not survive their first month of life; around 7,000 newborns pass away every single day. **(Neonatal mortality-UNICEF DATA & Newborns: Reducing mortality, 2020)**

More than 40 percent of neonatal deaths might be avoided with proper care around the time of delivery. Delivery attendant care, emergency obstetric care, newborn care (including clean birth practices like cord and thermal care), and resuscitation are all crucial interventions. 30 percent of all neonatal fatalities might be avoided with better care for premature and ill infants. **(WHO recommendations, 2020)**

Aims of the study:

This study aimed to evaluate the Impact of Health Educational Program for Pregnant Women on their Selected Postpartum and Newborn Care.

Objectives of the Study

1. To assess the existing knowledge and practice for pregnant women regarding their selected post-partum and Newborn Care
2. To design, implement and evaluate the impact of health educational program on maternal post-partum and newborn care.

Research Hypothesis

H1: Pregnant women who receive prenatal health educational program regarding post-partum and newborn care will have higher level of knowledge and have a good practice on post-test than pre-test.

H2: There will be a significant association between pre-test knowledge and practice scores of Women with their selected socio-demographic characteristics regarding post-partum and newborn care.

H3: There will be significant relation between pregnant women's knowledge with their practices regarding post-partum and newborn care.

Subject and Methods:

Research Design: Quasi-experimental research design (one group pre-test, post-test) was utilized to achieve the aim of the current study.

Research Setting: This study was conducted at Minia university hospital for maternity and child at antenatal clinics and post-partum department. This location is regarded as one of the major medical and specialist hospitals in North Upper Egypt, and it provides free health care for women and children during stages of the lifespan.

Sample: Purposive sample was utilized in this study. The sample size was determined according to the attendance of pregnant women suitable for inclusion criteria six months from the beginning of data collection in the research study. The total sample obtained during this period includes 70 pregnant women.

Inclusion criteria

Primi-gravida, gestational age ≥ 34 weeks of gestation, normal pregnancy without complications, expects to have a single full-term and normal newborn, women of the reproductive age range (18 yrs - 45 yrs) and only those mothers who have undergone normal delivery

Data Collection Tools:

The researcher developed data for the study after an extensive review of the literature and similar studies conducted elsewhere. The data collection tool consisted of three tools:

Tool I: (Interviewing Questionnaire) it was designed by the researcher, it was used to collect data related to women's socio-demographic characteristics, such as age, marital status, residence, educational level, occupational status of the mother, type of family in addition to the source of pregnant women knowledge regarding partum and newborn care.

Tool II: knowledge assessment Tool (pre/post-test) was developed to assess pregnant women's knowledge about post-partum and newborn care. It included eight main items maternal nutritional diet (7 items), personal hygiene, perineal care, and episiotomy (5 items), breast care (7 items), post-partum exercise (6 items), post-partum danger signs (1 item), post-natal visits (3 items), family planning counseling (5 items) and mother-infant relationship (1 item) in the form of multiple-choice questions. While women's knowledge about newborn care consisted of 7 main items, which include the mechanism of keeping the newborn warm (3 items), early and exclusive breastfeeding (12 items), umbilical cord care (5 items), eye care (3 items), newborn skin and diaper care (4 items), newborn vaccination (5 items), and newborn danger signs (1 item) also, in the form multiple questions.

Scoring System:

The women's answer related to knowledge was the score and calculated. Each correct & complete answer was given a score of two, correct & Incomplete answer was given a score one, and the wrong answer a score of zero; respectively, these scores were converted into a percent score (poor knowledge scored < 60% (<41 scores), average knowledge score 60% < 75% (41<51 scores) and good knowledge scored ≥75% (≥ 51 scores).

Tool III: (Observational checklist) (pre/post-test) It was developed by Darmstadt et al. (2018), Leifer (2019), and modified by the researcher after a review of related literature regarding selected items of post-natal and newborn care. It includes (breast care, perineal and episiotomy care, umbilical care, breast feeding, and newborn eye drop instillation) .

Scoring system

Scoring system of the Observational checklist, each done correctly take one score; done incorrectly and not done take zero scores. The total score < 50% was considered as unsatisfactory (< 27 steps), and ≥ 50% was considered as satisfactory practice (≥ 27 steps)

Supportive material:

The researcher updated a comprehensive literature review, and then the final result was made into a handout (booklet). It was written in straightforward Arabic and accompanied by various descriptive photographs to improve the nurse's awareness of post-partum and newborn care.

Validity and Reliability:

Five specialists in obstetrics and gynecology, as well as nursing professors, piloted the questionnaire to assess its clarity, relevance, comprehensiveness, understanding, applicability, and ease of use. The necessary modifications were done to the tools. To establish reliability, the tools were tested for internal consistency by using Cronbach's alpha test of 0.842 and 0.810, respectively, to check the stability of the internal consistency of the tools.

Pilot study:

The current study tools were evaluated in terms of their clarity, validity, and the amount of time required to be used in a pilot study that was carried out on 10% of pregnant women (seven women) in the environment that was just described. The necessary adjustment was carried out after the pilot project findings were analyzed. The pilot sample was incorporated into the primary sample for the investigation.

Data collection Procedure:

The current study was achieved through three phases: assessment phase (pre-test), implementation (conducting health educational program), follow-up, and evaluation phase (post-test).

An assessment phase: (pre-test)

- During the assessment phase, the researcher begins the first meeting with women in the antenatal outpatient clinic to introduce herself, greet each woman, and explain the study's aims, nature, duration, and activities.
- After gaining women's consent to engage in the study, the researcher gave them an overview and clarified the assessment tool question.
- Then the researcher interviewed each woman individually, completed the questionnaire as a pre-test of socio-demographic data, and assessed women's knowledge regarding post-natal and newborn care (Pre-test).
- The average time for the completion of each women interview was around 20-30 minutes)

An implementation phase (conducting education program)

In this phase, after assessing the women's knowledge and practice (pre-test), The educational program of this study was implemented through three sessions for each small group (2 to3 pregnant women) (one session for the theoretical part regarding the component of P.P and newborn care, last for around 25 to 35 minute and two sessions for practical part the length of each session different according to women response lasted for around 35 to 40 minute.

Different teaching methods were used as small group discussion, demonstration & re-demonstration on simulation mode (breast care doll, perineal care doll, and newborn baby doll), and using videos. Also, an Arabic booklet with pictures was given to each participant. Motivation and reinforcement during a session were used to enhance women's learning. The researcher collected the sample two days per week over six months, from July 2021 to December 2021.

An evaluation phase (post-test):
Three-time of evaluations were done for each woman:

The first time of evaluation (pre-test) was done before the implementation of the educational program by using tools II and tool III to assess women's knowledge and practice regarding post-partum and newborn care. Second-time evaluation (post-test) done immediately after implementation of the educational program using the same tools of pre-test (tools II and III) to evaluate the impact of health educational program on post-natal and newborn care. Third-time evaluation (post-test) done during 1st post-partum day (before discharge) by using tools of pre-test (toll II, III)

The impact of the health education program was done by comparing the pre-test and post-test conducted immediately and after delivery to assess their knowledge and practice regarding post-natal and newborn care.

Administrative design

The dean of the Faculty of Nursing and the director of Minia University Hospital for Maternity and Newborns provided official approval and authorization prior to conducting both the pilot study and the main study. The nursing faculty's ethics committee approved the research idea.

Ethical consideration:

After explaining the study's significance, nature, and purpose to the pregnant women willing to participate, the study is given the go-ahead officially. All participants have the right to decline to participate and/or withdraw from it at any time without giving a reason, privacy was considered during data collection, and no health risks were present. Participants were assured that all their information was kept in the strictest confidence, and anonymity was also guaranteed by giving each nurse a number rather than their name to preserve their privacy.

Statistical analysis

SPSS was used to tabulate, computerize, analyze, and summarize the acquired data in order to test study hypotheses (IBM, 28). It was deemed highly significant when the P-value was less than or equal to 0.01, and the significance level was $P < 0.05$.

Results

Table (1): Distribution of the pregnant women according to their socio-demographic data (n=70).

Socio-demographic data	No.	%
Age/years		
18 < 30 years	57	81.4
30 < 40 years	13	18.6
Mean ± SD	26.1 ± 2.8 years.	
Marital status		
Married	67	95.7
Divorced	3	4.3
Area of Residence		
Urban	17	24.3
Rural	53	75.7
Educational Level		
Illiteracy	34	48.6
Read and write	12	17.1
Primary /Preparatory education	6	8.6
Secondary education	10	14.3
University education	8	11.4
Occupational Status of Mother		
Worker	16	22.9
Housewife	54	77.1
Type of the family		
Nuclear	22	31.4
Joint	48	68.6

Table (1): Shows that more than three quarters (81.4%) of pregnant women were in the age group From 18 < 30 years old with a mean age of (26.1 ± 2.8), the majority (95.7%) of them married, about three quarter (75.7%) lived in a rural area, near half of them (48.6%) not educated, more than three quarter (77.1%) housewife and more than two third of them (68.6%) lived with joint family.
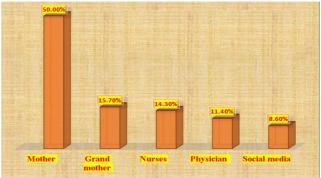

Figure (1): Distribution of the studied pregnant women regarding their source of knowledge about post-partum and newborn care (n =70)

Figure (1): illustrates that half (50%) of the pregnant women's source of knowledge about post-partum and newborn care was from their mother, and only 8.6% of their source of knowledge was social media.
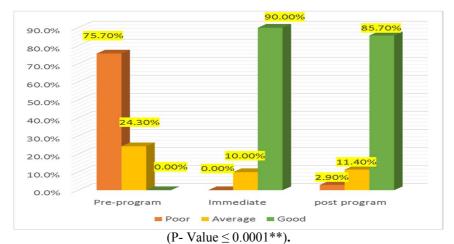

(P- Value ≤ 0.0001**).

Figure (2): Total knowledge level of the pregnant women regarding post-partum and newborn care levels of the pregnant women pre-/ immediate and post-program (n =n 70)

Figure (2): Illustrates significant improvement observed in the level of knowledge immediately and post-program 90% & 85. 70 % compared to the pre-test with highly statistically significant differences at (P -value ≤ 0.0001).

(P-value ≤ 0.0001**)

Figure (3): Total Self-care practice levels of the pregnant woman pre-/ Immediate and post-program (n= 70).

Figure (3): - Illustrated that the total level of self-care practice immediately and post-test was satisfactory at 97.1% and 94.3%, respectively, compared to the pre-educational program with highly statistically Significant differences at P-value ≤ 0.0001.

Table (2): Relation between socio-demographic data of the pregnant woman and their total knowledge levels pre-program (n= 70).

Items	No.	Total knowledge levels pre-program				X^2
		Poor (n = 53)		Average (n = 17)		(P – Value)
		No.	%	No.	%	
Age/years						
18 < 30 years	57	49	86.0	8	14.0	3.145
30 <40 years	13	4	30.8	9	69.2	(0.001)**
Marital status						
Married	67	50	74.6	17	25.4	Fisher (0.316)
Divorced	3	3	100.0	0	0.0	
Area of Residence						
Urban	17	13	76.5	4	23.5	Fisher
Rural	53	40	75.5	13	24.5	(0.933)
Educational level						
Illiteracy	34	33	97.1	1	2.9	Fisher
Read and write	12	9	75.0	3	25.0	
Primary /Preparatory education	6	4	66.7	2	33.3	(0.009)**
Secondary education	10	4	40.0	6	60.0	
University education	8	3	37.5	5	62.5	
Occupational Status						
Worker	16	11	68.8	5	31.3	1.745 (0.460)
Housewife	54	42	77.8	12	22.2	
Type of the family						
Nuclear	22	14	63.6	8	36.4	2.784 (0.111)
Joint	48	39	81.3	9	18.8	

Fisher test was done **Highly statistically significant differences percentage calculated by raw

Table (2): Illustrate there highly statistically significant relationship between the total level of knowledge and their age and educational level in which P-value ≤0.001 & 0.009 respectively.

Table (3): Relation between demographic data of the pregnant woman and their total self-care practice scores pre-program (n= 70).

Items	No.	Total practice pre-program	t-test	P - Value
		Mean ± SD		
Age/years				
18 < 30 years	57	9.5 ± 2.5	0.912	0.365
30 <40 years	13	8.8 ± 1.9		
Marital status				
Married	67	9.3 ± 2.4	1.473	0.145
Divorced	3	11.3 ± 1.5		
Area of Residence				
Urban	17	9.4 ± 1.9	0.065	0.948
Rural	53	9.4 ± 2.5		
Educational level				
Illiteracy	34	8.3 ± 2.3	F	
Read and write	12	8.5 ± 2.3	1.577	0.05*
Primary /Preparatory education	6	8.5 ± 2.3		
Secondary education	10	8.2 ± 2.1		

Items	No.	Total practice pre-program Mean ± SD	t-test	P - Value
University education	8	10.5 ± 2.6		
Occupational Status				
Worker	16	9.4 ± 2.5	0.099	0.921
Housewife	54	9.3 ± 2.3		
Type of the family				
Nuclear	22	9.5 ± 2.6	0.381	0.704
Joint	48	9.3 ± 2.3		

Table (3): - Illustrates that a statistically significant relationship between total practice's mean scores and educational level at P-Value ≤ 0.05.

Table (4): Correlation between the total women's practice scores and their total knowledge

	Total practice	
Total knowledge	R	0.256
	P –value	0.05*

Spearman's rho test

Table (4): Reveals that fair correlation between the total women's practice scores and their total knowledge (r=0.256; P – value < 0.05).

Discussion

Concerning the characteristics of the studied pregnant women, the results of the current study revealed that more than three-quarters of pregnant women were in the age group from 18 < 30 years old with a mean age of (26.1 ± 2.8), majority of them are married, about three quarter lived in a rural area, near half of them not educated, more than three-quarter housewife and more than two third of them lived with joint family. This finding was similar to a study conducted by **Beraki et al. (2020),** who studied "Knowledge on post-natal care among post-partum mothers during discharge in maternity hospitals in Asmara: a cross-sectional study" and reported that more than two third of the studied sample (70.8%) in the age group from 17 to 30 years, majority of the study sample were married (92.8%). More than three-quarters (80.7%) were housewives. Still, the same author differed from the study finding in relation to residence and educational level, as nearly three-quarters of them (73.2%) were from rural areas. More than half of them (57.2%) are in secondary education. This contrary might be due to differences in educational systems across countries.

In the same context, this result aligned with the study by **Akoth et al. (2022),** who study Knowledge, Attitude, and Practice toward Essential Newborn Care among Post-natal Mothers Attending Health Facilities in a Rural District. The participants' mean age was 26.13±5.69; the majority of mothers were aged between 20-29 years; the majority were married. and around two third of them were unemployed.

Concerning the source of knowledge about post-partum and newborn care, the present study demonstrated that half of the pregnant women's source of knowledge about post-partum and newborn care was from their mothers, and only 8.6% of them their source of knowledge was social media**.** This finding was inconsistent with **Syan et al. (2021),** who studied the Effect of Instructional Guidelines on Mothers' Knowledge and Practice regarding Neonatal Care and reported that nearly half of the studied mothers (42%) gained their knowledge from their families, but the same author agrees with the current study as only 7% of them gain knowledge from social media. This finding may be due to the study sample's lack of educational level.

Regarding knowledge of the studied sample pre, immediate, and post-educational program, the current study

revealed a highly statistically significant difference between pre & post-implementation of educational program regarding their knowledge about post-partum and newborn care. This finding revealed that education and training play an important role in improving women's knowledge, so the health educational package on post-partum self-care should be given in the discharge plan. It should be written in clear, simplified, and comprehensive explanation about post-partum issues supported by drawing pamphlets, especially for illiterate ones, to raise the awareness of post-partum women about these issues, especially in rural Egypt.

The current study findings were supported by **Neamah et al. (2020**), who studied the Effectiveness of an Educational Program regarding the knowledge of women about maternal care during the post-partum period attending the primary health care centers at Al Amara City/Iraq reported that statistically significant difference in women's general knowledge regarding puerperium was observed between the pre-and post-tests for the study group, compared to the pre-and post-tests for the control group even while there was no statistically significant change in women's general puerperium knowledge between the pre-and post-test periods When compared to the placebo group.

In the same line as the current study, which revealed that around three-quarters of the study sample was poor knowledge pre-implementation of the educational program, a study conducted by **Omran et al. (2020)** reported that more than three quarter (77.6%) of post-partum women had unsatisfactory knowledge toward total post-partum self-care, This similarity may be due to, majority of the studied sample was a housewife and low level of education and from the rural area as there is an irregularity in health education program because not easy to access to transport in rural places. It is found that those with no formal education are nearly twenty times more liable to have poor knowledge regarding post-natal care than those of college or higher. Housewife women have triple the risk of having poor knowledge compared to those working.

The current study finding was confirmed by **Huidrom & Kumar (2021)** confirmed the current study finding, which studies structured teaching programs regarding selected aspects of safe motherhood on knowledge among primipara mothers, shows a statistically significant increase in

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knowledge of certain areas of post-natal care among primipara moms, as measured by a comparison of their pre- and post-test scores. This result may be due to the overall participation of the study sample being primigravida only between both studies.

In the same line study with the current study finding, a study done by **Chamangasht et al. (2022)** who study the Efficacy of an Early Self-Care-Based Education Program on the Self-evaluation of Primiparous Postpartum Mothers" illustrated that Based on the dependent-test results, no meaningful difference in the groups' mean total self-evaluation scores before the education program, but there was a clear distinction afterward. Due to inexperience, insufficient education, and inadequate preparation, primiparous women in this study experienced significant physical and emotional difficulties in the post-partum period. Women affected by their families also benefitted from education sessions that dispelled myths they had about caring for themselves and their newborns. If a healthcare professional educates women about something, it should be about their health, and they should do it either at home or in healthcare facilities.

Concerning women's knowledge about newborn care, there was a high statistical significance difference between the pre-, immediate, and post-implementation of the educational program. This finding was in line with the study by **Abd El-Salam et al. (2019),** who studied the Effect of the Instructional Program on Primipara Mothers' Knowledge Regarding Neonatal Care, which showed mothers' knowledge of newborn care increased significantly between the pre-and post-tests.

Along the same line, the current study was supported by **Syan et al. (2021),** who studied the Effect of Instructional Guidelines on Mothers' Knowledge and Practiced regarding Neonatal Care and showed that mothers' knowledge of how to care for their newborns improves both before and after the introduction of guidelines. This finding reflected the positive effect of instructional guidelines that the mothers introduced regarding their neonates' care.

The current study found that about three-quarters of pregnant women had `poor knowledge regarding newborn care pre-educational programs. This finding was confirmed by **Leta (2022),** who studied the level of knowledge of essential newborn care practices among post-natal mothers in governmental hospitals of Harar Town and found that more than half of them had insufficient knowledge. Therefore, policy consequences and recommendations could lead to a more substantial rise in the quality of fundamental newborn care practices.

In contrast to the current results, **Getachew et al. (2022)** studied the magnitude and Determinants of Post-natal Mothers' Knowledge of Essential Newborn Care at Home in Rural Ethiopia. Reported that Overall, 33.5% of the mothers had good knowledge of ENC. Also, the result disagrees with **Bhattarai et al. (2021),** who studied Knowledge and Practice on Neonatal Care Among Post-natal Mothers in A Selected Teaching Hospital in Kaski District, Nepal, and reported that the level of knowledge was good among 60.7% of the post-natal mothers whereas 39.3% of the post-natal mothers had poor level of knowledge.

Concerning pregnant women's practices regarding post-partum and newborn care pre- and post-educational program implementation, the present study showed a significant improvement in total practice regarding post-partum and newborn care among the studied pregnant women

in the post-test compared to the pre-test (P-value ≤ 0.0001). This result was confirmed by a study done by **Eraky & Hassan (2018),** who studied the effect of newborn-care practices for post-natal mothers on the occurrence of selected health problems among their newborn infants, revealed that a highly statistically significant difference has been found between means of mothers' practice regarding eye care, cord care and diaper care pre- and post-intervention as (p <0.0001).

Also, the result come inconsistent with **Bhattarai et al. (2021)**, who studied Knowledge and Practice on Neonatal Care among Post-natal Mothers in A Selected Teaching Hospital in Kaski District, Nepal. Revealed that the level of practice was adequate among 80.7% of the post-natal mothers, whereas 19.3% of the post-natal mothers had inadequate practices. These differences may be due to socio-cultural differences between countries, and most of your study sample were multigravida women up to the secondary level of education.

In agreement with the current study finding, a study done by **Syan et al.(2021)** reported that There was a statistically significant difference and improvement in mothers' reported care practices of their neonates before and after the implementation of the instructional guidelines regarding breastfeeding, kept warm practice, skin care practice, and cord care practices. Implementing an instructional program regarding mothers' care for their neonates improved the mothers' knowledge and reported practices. Therefore, the results of the current study comply with the research hypothesis.

Regarding the relation between the socio-demographic characteristics of the studied pregnant women and their total knowledge level pre-educational program implementation, the present study showed a statistically significant relation between the total knowledge levels of studied pregnant women pre-educational program and their age and educational level. This result may be due to middle age and higher educational levels being more knowledgeable than others. This finding was in the same line with the study done by **Beraki et al. (2020).** Revealed a significant difference in the average knowledge score regarding post-natal care among post-partum mothers across different age groups and educational levels. However, the same author differed from the current study finding regarding marital status. Moreover, a significantly higher knowledge score was observed among married and divorced people compared to single people living together. Moreover, **Rahmadhani (2020)** reported that There was a significant relationship between knowledge with educational status, which are included in demographic characteristics (p <0.05).

The current study finding was supported by **Huidrom & Kumar (2021),** reporting that a statistically significant association was present between the level of knowledge gain and age and education at the P<0.001. But the same author differs with the place of residence as the present study shows no association between pregnant women's knowledge and residence. This may be due to differences in health educational program between countries.

Regarding the **Relation between demographic data of the pregnant woman and their total self-care practice scores pre-program** pre-educational program implementation, It presents a statistically significant relationship between total practice's mean scores and educational level. This finding disagrees with a study by

Eraky & Hassan (2018), which indicated no statistically significant relation between post-natal mother's residence, educational level, and the total mean score of practice.

The current study finding was supported by **Das & Mistry (2022),** who studied Factors influencing the Knowledge and Practices of Newborn Care; the study result shows an association between mother knowledge and practice regarding newborn care and their education. The practice level was higher (79.5) percent) among women regarding newborn care with educated mothers while 20.5 percent in the illiterate mother. More practice regarding newborn care has been found in the educated group. This may be because educated mothers can understand information better than illiterate ones.

Related to the correlation between the total women's practice scores and their total knowledge, the current study finding reveals a fair correlation between the total women's practice scores and their total knowledge post-implementation of the educational program. This finding was similar to the study by **Omran et al. (2020)**, who mentioned the high statistical significance of post-partum women's total knowledge & their total self-care practice post-self-care program. This result is in line with **Pradan & Rani (2018),** who explained that there was a positive correlation between the level of knowledge and practice of post-natal mothers regarding selected aspects of post-natal care. This similarity may be due to the good knowledge effect positive on practice after implementing an educational program.

Conclusion
Based on the present study findings, the study concluded that:

The implementation of the health educational program was effective and significantly improved pregnant women's overall knowledge and practice towards maternal and newborn care in the post-partum period. It found a statistically significant improvement in pregnant women, knowledge immediately, and the first day post-partum. As well as there was a statistically significant difference in pregnant women's practice pre- and post-implementation of health educational programs.

Recommendations
In light of the present study findings, the following recommendations are suggested:
- Regular training programs to educate pregnant women, especially primigravida, to improve their knowledge and practice about post-partum and newborn, which can reduce maternal and newborn morbidity and mortality.
- Health educational packages on post-partum and newborn care should be given on the discharge plan, especially for new and ill-illustrated mothers.
- Replication of this study with a larger sample of different areas with longitudinal follow-up is recommended to generalize the results.

Acknowledgment

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