

Effect of Nursing Educational Package for Pregnant Women upon Selected Aspects of Postnatal and Newborn Care

Naeima Mohamed El-Sayed Ahmed^{1,*}, Bataa Mahmoud Mohammed²,
Neveen Mohamed Mohamed Hasaneen³

¹Lecturer of Obstetrics and Gynecological Nursing, Faculty of Nursing, Zagazig University, Zagazig, Egypt

²Lecturer of Pediatrics Nursing, Faculty of Nursing, Zagazig University, Zagazig, Egypt

³Lecturer of Obstetric and Gynecology Nursing, Faculty of Nursing, Suez Canal University, Ismailia, Egypt

*Corresponding author: dr_naima2002@yahoo.com

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Abstract Postnatal period is the most important part of maternal health care as the dangerous and life threatening complications occurs during this period. Mothers and newborns are vulnerable to illness during this phase. So, mother's knowledge and education before childbirth regarding postnatal and newborn care is important for the health of the mother's as well as the health of newborn. **Aim:** intended to evaluate the effect of nursing educational package for pregnant women upon selected aspects of postnatal and newborn care. **Design:** A quasi-design with pre/posttests used. **Setting:** on antenatal and postnatal departments at Zagazig University hospitals. **Subjects:** A purposive sample composed of 80 pregnant women. **Tools:** Divided to three tools as: **Tool I:** Interviewing questionnaire. **Tool II:** Pregnant women knowledge about postnatal and newborn care. **Tool III:** An observational checklist regarding selected items of postnatal and newborn care. **Results:** It was revealed that 25% of the studied mothers had satisfactory knowledge score before implementation of the educational package then this percentage was increased to 76.30% immediately after the implementation and slightly decreased to 71.30% in the follow up phase. In additions to improving mothers' total practice score related to postnatal and neonatal care three phases of educational intervention. **Conclusion:** Implementation of the educational package about selected aspects of postnatal and newborn care was effective in improving level of pregnant women's total knowledge and total practices scores, where, their knowledge and practices at the post and follow up tests were higher than that of pre-test with a statistical significant difference. **Recommendations:** Establishing a comprehensive training program for pregnant women especially primiparous at MCH centers are mandatory to improve their knowledge and practices on the different aspects of postnatal and newborn care which can reduce the maternal and neonatal morbidity and mortality rate.

Keywords: nursing educational package, pregnant women, postnatal care, newborn care

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1. Introduction

Postnatal time is the most important phase for mother and newborn health where, most of maternal and newborn deaths occurring during this phase. It is also the most neglected phase for the provision of quality care. Postnatal period starts with 1 h. after delivery for placenta and extended about 6 weeks. It's a period of physiological and anatomical adjustments after pregnancy where, the pregnancy changes begin to reverse and the body returns to its pre pregnancy level [1]. Postnatal care considered as one of the most important maternal health care services for the prevention of impairments and disabilities for child birth,

in additions to the reduction of maternal and neonatal mortality rate. It's composed of a systemic examination for the women and newborn with giving an appropriate advice and instructions regarding the postpartum period [2].

Postpartum period is regarded as one of the most crucial and transitional phase in mothers life, where, a lot of physiological, emotional and social changes occurs during it. Thus, a specific care for these women and their child must be needed in order to prove safe motherhood and healthy living [3]. Postpartum health practices as personal hygiene, postnatal diet, exercise, perineal care and timing for the beginning of breast feeding are considered very important not only for the promotion of health survival but also for the reduction of morbidity and mortality rate [4,5].

Neonatal period constitute the first four weeks of neonatal life which considered one of the most sensitive life stages and require more care . Early breast feeding and kept baby close to their mothers reducing risks of hypothermia and hypoglycemia [6].

It is very important for mothers to get adequate information and knowledge regard to self-activities and healthy practices during postnatal period and maternity nurses has vital role in improving health and giving more awareness for sequence of poor maternal and neonatal health [7].

Education information's is an integral part of maternal and child health care, where, proper health education can promote healthy mother and newborn which will reduce the mortality rate for them. During postnatal period a variety of healthy interventions as prevention of infection, nutritional diet and newborn care assist in the healing process for the postnatal mother and newborn, so, nurses should educate the mothers about these interventions which will help them in gaining knowledge and maintaining a positive health for herself and her baby [3].

1.1. Significance of the Study:

Harmful practices regarding postnatal and neonatal care were prevalent among mothers. In 2015, about 830 women died every day due to complications of pregnancy and child birth. In addition to 2.6 million globally died child for first month (2016 alone) , about 7,000 neonatal death every day in first week. On current trends, Sustainable Development Goals (SDG), reducing global maternal mortality below 70 /100 000 live births neonatal mortality less 12 / 1000 live births (2030) is the target [8]. Furthermore, up to third of these deaths will be prevented by increasing education times through intervention for mothers and practiced effective measures for self-care after childbirth. Current study had a genuine interest to assess the effect of nursing educational package for pregnant women upon selected aspects of postnatal and newborn care

1.2. Aim of the Study:

Evaluate the effect of nursing educational package for pregnant women upon selected aspects of postnatal and newborn care.

1.3. Objectives:

- To determine the existing knowledge and practice of pregnant women regarding selected aspects of postnatal and newborn care.
- To design, implement and evaluate the effectiveness of educational package on maternal postnatal and neonatal care

1.4. Research Hypothesis:

Pregnant women who receive nursing educational package regarding postnatal and newborn care will have higher level of knowledge and have a good practice on posttest than pretest.

2. Subjects and Methods

2.1. Design:

A quasi - experimental used in this investigation.

2.2. Study Setting:

The study was conducted at antenatal and postnatal departments at Zagazig University hospitals.

2.3. Sample Size

The sample size was calculated through EPI info (Epidemiological information system) software version 6 according to the following collected data, the confidence level 95% and a power of study 80%.

2.4. Study Subjects

A purposive sample comprised of 80 pregnant women chosen according to following characteristics:-

- Literate women(read and write)
- Primiparous women
- Age from 18 to 35 years
- Gestational age \geq 32 weeks
- Viable and singleton fetus without any congenital anomalies.
- Women who delivered normally and had episiotomy.
- Women who agree to participate in the study

Tools of data collection:

Data were collected through interviewing pregnant women using the following three tools which were developed by the investigators after extensive reviewing of related literature.

Tool I:

The first tool was pregnant women's interviewing questionnaire that divided into two parts:

Part 1:

This was concerned with pregnant women's demographic data such as age, study qualification, occupation and residence. In additions to previous women information regarding postnatal and newborn care and the source of this information.

Part 2:

This was covered pregnant women's obstetrical history as number of gravida and duration of gestational age.

Tool II:

This was intended to assess the studied mother's knowledge about postnatal and newborn care in the form of closed and open ended questions and was written in a simple Arabic language. As for mother knowledge regarding postnatal care it was categorized into five groups of care as follows: Personal hygiene (5items), maternal diet (3items), perineal and episiotomy care (5items), breast care (5items), postnatal exercise (2items) and women knowledge regarding postnatal danger signs (2items). Meanwhile, mother's knowledge regarding newborn care it was addressing the following items: General information about newborn (3 items), physiological functions(3 items), as well as mother knowledge about newborn umbilical cord care (5 items), breastfeeding (7 items), thermogenic preservation (2 items), newborn immunization (2 items),

newborn danger signs(2 items) and signs of eye infection (2 items).

2.5. Scoring System:

Mother's answers related to knowledge were scored and calculated. A scoring for mother's knowledge was consisted of given "1" for a correct answer and "0" for incorrect one or for any women who didn't know the answer. A scoring was given to each question and a total knowledge score that ranges from zero to 48 points was adopted. Score knowledge below 60% classified as unsatisfactory and mothers had 60% and more was described as satisfactory knowledge.

Tool III:

An observational checklist regarding selected items of postnatal and newborn care which containing (Perineal and episiotomy care, umbilical cord care, breast feeding and newborn eye drop instillation) developed by the researchers and guided by [9,10]. It contains 33 step divided into (7steps) for perianal care, (10 steps) for cord care, (9 steps) for breast feeding and (7 steps) for eye drop instillation.

2.6. Scoring System:

The scoring system was developed by the investigators and the possible response for each step in observational checklist was done or not done. The scores given for each were 1 and zero respectively and the total score of practice was thirty three marks. The total score of mother's practice was classified as follows:

- Mothers were considered satisfactory when the total score was 60% and more
- Unsatisfactory when the total score is less than 60%.

2.7. Validity and Reliability:

The two tools and the educational intervention were reviewed for comprehensiveness, suitability, and legibility by an expert panel of jury of five experts in the field of obstetrics and gynecologic nursing in additions to experts in pediatric nursing. Modifications of the tools were done according to the experts' judgment on clarity of sentences, appropriateness of content and sequence of items. Internal consistency reliability of all items of the tools was assessed using Chronbach's Alpha test, its result was 0.811 for knowledge and 0.856 for practice which indicates an accepted reliability of the tools.

2.8. Field Work

Data collection took a period of nine months from the beginning of September 2015 to the end of May 2016. After getting the official permission and after identifying the mothers who fulfilled the criteria of the study. Women's were requested to participate in the study and they were met by the researchers 3 days per weeks (Saturday, Monday and Wednesday) at their available time (after their checkup and follow up visits) from 10:00 am. To 12 pm and the previously mentioned three days were selected because these days were specified for pregnant women follow up at the antenatal departments.

The educational program was developed through four phases as follows.

(I) Assessment Phase:

It involved the pre-intervention data collection for baseline assessment. Upon obtaining necessary official permissions to carry out the study, the researchers were explained the aim of the study to women and had their approval to participate in the study. Then the researchers read and explained each item of the study tool to the woman and recorded her responses to each item. The researchers gave the questionnaire to each woman individually according to their available time and asked them to answer and fill it as a pretest before the evaluation of their practice. Then the researchers evaluated their practice through observational checklist. The time consumed for completing the questionnaire and checklist was ranged from 30 to 45 minutes.

(II) Planning Phase:

Questionnaire and observational checklist (from pilot and assessment phase) as well as reviewing the related literature and on the basis of identified needs the educational package was developed by the researchers and consisted of two parts (theoretical & practical). Theoretical part: Contains the following two components; the first was maternal postnatal knowledge regarding (personal hygiene, diet, episiotomy, breast care, exercise and maternal danger signs). The second was maternal knowledge about the neonate (general information's regarding newborn, physiological function, umbilical cord, breast feeding, body temperature preservations, danger signs and the signs of eye infection). Practical part: Demonstration and re-demonstration concerning (perineal and episiotomy care, umbilical cord care, breast feeding and eye drop instillations). The contents of the educational package was written in Arabic language.

General objectives of the program:

The educational package aimed to improve pregnant women's' knowledge and practice regarding selected aspects of postnatal and newborn care.

Specific objectives of the program

At the end of this educational package, the pregnant women would be able to:

- Enhance knowledge regarding selected aspects of postnatal care as personal hygiene, diet, exercise, perineal and episiotomy.
- Acquire knowledge about some of newborn care as physiological function, umbilical cord care, preservation of newborn body temperature.
- Identify postnatal danger signs for mother and newborn.
- Recognize the signs of newborn eye infection.
- perform good practice regarding some of selected postnatal and newborn care as (perineal and episiotomy care, umbilical cord care, technique of breast feeding and eye drop instillation)

(III) Implementation Phase:

The educational package of this study was implemented through ten sessions (1 session for intervention orientation and pretest, 4 for theoretical part & 4 for the practical part and the one was for posttest). The educational intervention was implemented in small groups in the antenatal unit; each group consisted of five to eight women according to their availability and spare time after completing their

checkup in the antenatal department. All participants received the same content using same training methods and same booklet. The length of each session differed according to the content and women's responses and ranged 30-45 minutes. The first session was about the orientation to the educational intervention like (the rationale, importance of the subject, contents, time and location and pretest assessments), second and third sessions for the component of postnatal period, fourth and fifth sessions were focused on newborn items, and the last five sessions were for the practical part and posttest assessments. For the practical sessions each procedure was demonstrated on a model. Each session started with a summary of the previous session and the objectives of the new one. Sessions were explained in Arabic language, motivation and reinforcement during a session were used in order to enhance women's learning. Teaching methods were selected to suit teaching in small groups in a form of group discussion, demonstration and re-demonstration. Additionally the practical intervention was aided by using suitable teaching methods as videos, pictures, simulation of newborn, umbilical cord and model for episiotomy.

2.9. Evaluation Phase:

In this phase every woman of the studied sample was interviewed immediately after implementation of the educational package (posttest) and also after 24 hours postnatal by using the same tools of pretest (follow up phase).

Pilot Study

Before starting the data collection, a pilot study was conducted on 10% [8] pregnant females from the study sample to evaluate the content of the tools, their clarity as well as to estimate the time needed for filling the questionnaire with the collected data. Minor modification was done and the sample wasn't added to the total study.

Administrative and Ethical Consideration

Official letter of faculty of nursing, Zagazig University directed to the responsible authorities to obtain their permission. Research Ethics Committee of the Faculty of Nursing at Zagazig University was approved the research and all ethical issues were taken with considering in study. An oral agreement for participation in the study was gained. Those who agreed to participate were assured about confidentiality, privacy and their right to leave the study at any time.

Analysis

The collected data were organized and analyzed by using appropriate statistical significant tests. The statistical analysis was performed using the statistical package for social science (SPSS) program, version 19 for windows data editor. The collected data were organized, categorized, tabulated and statistically analyzed to evaluate the difference between pre and post of the program regarding various parameters. The statistical significance and associations were assessed using the arithmetic mean, standard deviation (SD), chi-square test (X^2) and P value. Also Cronbach alpha coefficient test was used to assess the reliability of the developed tools through their internal consistency. Comparison was done between the total score of the pretest and posttest of the different items obtained by the studied women by using T test. Pearson correlation

coefficient was calculated to assess relationship between various study variables.

3. Results

Characteristics of the studied mothers were shown in Table 1. It was found that 66.3% of the mothers in the age group 18<24 years and those aged 30-35 constituted 25% with mean age of 23.7 ± 5.5 years. Concerning qualification, 58.8% had finished their secondary education while 8.8% were just read and write. As well as 82.5% were house wives and 90% were from rural. The same table revealed that 30% of the studied mothers had previous information about postnatal and neonatal care, of those only 41.7% had health education from internet.

Table 1. Characteristics of the studied women (N=80)

| Items | N | % |
|---|----|------|
| Age (year) | | |
| • 18<24 | 53 | 66.3 |
| • 24<30 | 7 | 8.7 |
| • 30-35 | 20 | 25 |
| Mean \pm SD 23.7 \pm 5.5 | | |
| Study qualification | | |
| • Read and write | 7 | 8.8 |
| • Primary | 13 | 16.2 |
| • Secondary | 47 | 58.8 |
| • University | 13 | 16.2 |
| Occupation | | |
| • Housewife | 66 | 82.5 |
| • Working | 14 | 17.5 |
| Residence | | |
| • Urban | 8 | 10 |
| • Rural | 72 | 90 |
| Previous information regarding postnatal and neonatal care | | |
| • Yes | 24 | 30 |
| • No | 56 | 70 |
| If yes, from whom (N=24) | | |
| • Physician | 5 | 20.8 |
| • Internet | 10 | 41.7 |
| • TV | 5 | 20.8 |
| • Family | 4 | 16.7 |

Table 2 reveals obstetric history of the studied mothers. It was found that 81.2% of the studied mothers were primigravid as well as 63.7% with gestational age 35-37 weeks.

Table 2. Obstetrical history of the studied women (N=80)

| Items | N | % |
|-------------------------------|----|------|
| Number of gravida | | |
| • 1 | 65 | 81.2 |
| • 2 | 8 | 10.0 |
| • 3 | 4 | 5.0 |
| • 4 | 3 | 3.8 |
| Mean \pm SD 1.31 \pm 0.73 | | |
| Gestational age | | |
| • 32- <35 | 29 | 36.3 |
| • 35- 37 | 51 | 63.7 |
| Mean \pm SD 34.6 \pm 1.14 | | |

Knowledge of studied mothers' regarding postnatal care was illustrated in Table 3. It was reported that the highest mean score were breast care, followed by personal hygiene and episiotomy care 2.65 ± 1.22 , 1.99 ± 0.87 and 1.84 ± 0.91 respectively before the educational intervention then increased to 4.41 ± 0.28 , 4.11 ± 0.9 and 4.25 ± 0.57 immediately after intervention and slightly decreased to 4.13 ± 0.68 , 3.97 ± 1.05 and 4.07 ± 0.72 at follow up respectively. The differences were statistically significant ($P<0.05$).

Table 4 difference between studied women regard to selected aspect of neonatal care knowledge in post-test and compared to pre-test. Mean knowledge score in the posttest and follow up was higher regarding breast feeding, umbilical cord and signs of eye infection which was (6.20 ± 0.63 , 5.97 ± 1.00 , 4.05 ± 0.93 , 3.97 ± 1.44 and 1.73 ± 0.19 , 1.71 ± 0.2 respectively) after the educational intervention.

Percentage distribution of studied women regarding their knowledge throughout the intervention phases was portrayed in Figure 1. It was illustrated that 25% of the studied mothers had satisfactory knowledge score before implementation of the educational intervention. This percentage increased to 76.30% immediately after the implementation and then slightly decreased to 71.30% in the follow up phase.

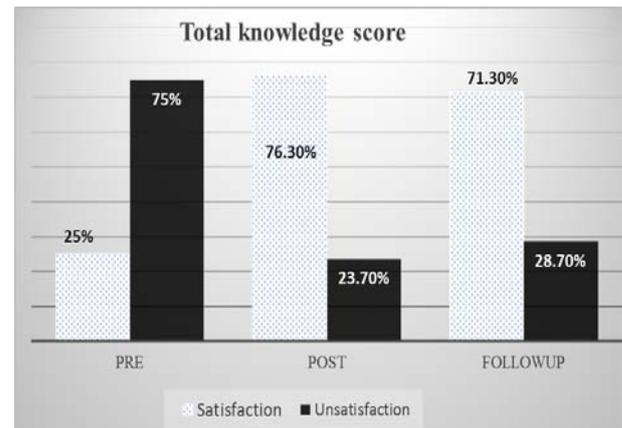


Figure 1. Percentage distribution of studied mothers regarding their knowledge throughout the intervention phases (N=80).

Table 5 Highest score 6.48 ± 3.15 for breast feeding before intervention then increased to 12.77 ± 1.24 post intervention compared to 12.63 ± 1.47 for follow up phase. Meanwhile the lowest mean score was 2.16 ± 1.66 for perineal and episiotomy care before intervention compared to 5.39 ± 1.28 and 5.17 ± 1.35 immediately after and during follow up phase respectively. The differences were statistically significant ($p<0.05$).

Table 3. Compare means between studied women according to their knowledge about selected aspect of postnatal care throughout the intervention phases (N=80)

| Selected aspects of postnatal care | Pre test | Post test | Follow up | Friedmantest | |
|------------------------------------|-----------|------------|------------|----------------|----------|
| | Mean± SD | Mean± SD | Mean± SD | X ² | p. value |
| • Personal hygiene | 1.99±0.87 | 4.11±0.9 | 3.97±1.05 | 11.81 | .001** |
| • Maternal diet | 1.17±0.65 | 2.54±0.33 | 2.41±0.40 | 9.16 | .003** |
| • Episiotomy and perineal care | 1.84±0.91 | 4.25±0.57 | 4.07±0.72 | 12.42 | .000** |
| • Breast care | 2.65±1.22 | 4.41±0.28 | 4.13±0.68 | 8.53 | .004** |
| • Postnatal exercise | 0.87±0.34 | 1.61±0.23 | 1.58±0.31 | 6.91 | .009** |
| • postnatal danger signs | 0.42±0.51 | 1.33±0.35 | 1.28±0.47 | 4.58 | .012* |
| Total | 9.76±3.46 | 19.12±2.41 | 17.81±3.05 | 14.07 | .000** |

* $P<0.05$ (significant) ** $P<0.001$ (highly significant)

Table 4. Mean knowledge of the studied women regarding neonatal care throughout the intervention phases (N=80)

| Domains | Pre test | Post test | Follow up | Friedman test | |
|----------------------------|------------|------------|------------|----------------|----------|
| | Mean± SD | Mean± SD | Mean± SD | X ² | p. value |
| • General information | 1.12±0.94 | 2.54±0.41 | 2.38±0.53 | 7.55 | 0.008** |
| • Physiological functions | 1.17±0.68 | 2.26±0.55 | 1.98±0.81 | 5.10 | 0.011* |
| • Umbilical cord care | 2.26±1.01 | 4.05±0.93 | 3.97±1.44 | 9.08 | 0.006** |
| • Breast feeding | 3.61±1.54 | 6.20±0.63 | 5.97±1.00 | 10.35 | 0.004** |
| • Thermogenic preservation | 0.79±0.41 | 1.57±0.29 | 1.60±0.28 | 6.77 | .009** |
| • Newborn immunization | 1.12±0.36 | 1.61±0.29 | 1.64±0.28 | 4.16 | .014* |
| • Newborn danger signs | 1.01±0.45 | 1.56±0.24 | 1.46±0.31 | 3.02 | .021* |
| • Signs of Eye infection | 1.29±0.39 | 1.73±0.19 | 1.71±0.21 | 8.34 | .009** |
| Total | 12.46±4.11 | 22.38±3.11 | 21.94±2.97 | 12.56 | .001** |

* $P<0.05$ (significant) ** $P<0.001$ (highly significant)

Table 5. Compare means between studied women according to their practice about postnatal care (N=80)

| Domains | Pre test | Post test | Follow up | Friedman test | |
|--------------------------------|------------|------------|------------|----------------|----------|
| | Mean± SD | Mean± SD | Mean± SD | X ² | p. value |
| • Perineal and episiotomy care | 2.16±1.66 | 5.39±1.28 | 5.17±1.35 | 10.18 | .001** |
| • Umbilical cord care | 4.23±2.02 | 7.98±1.08 | 7.31±1.36 | 8.46 | .004** |
| • Breast feeding | 6.48±3.15 | 12.77±1.24 | 12.63±1.47 | 11.50 | .000** |
| • Eye drop instillation | 3.69±2.57 | 8.11±0.96 | 7.54±2.00 | 9.08 | .002** |
| Total | 18.32±4.71 | 35.51±2.37 | 34.16±3.01 | 12.45 | .000** |

** $P<0.001$ (highly significant)

Table 6. Multiple Linear regression model

| | Unstandardized Coefficients | | standardized Coefficients | T | P. value |
|-------------------|-----------------------------|----------|---------------------------|------------------------|----------|
| | B | | β | | |
| Age | .461 | | .454 | 7.482 | .014* |
| Educational level | .724 | | .717 | 9.407 | .004** |
| Residence | .108 | | .154 | 2.825 | .051 |
| Occupation | .654 | | .656 | 13.351 | .002** |
| Total practice | 1.746 | | .811 | 15.251 | .000** |
| Model summary | | | | | |
| Model | R | R square | Adjusted R square | Std. error of estimate | |
| Regression | .954 | .912 | .864 | .524 | |

*P<0.05 (significant) **P<0.001 (highly significant)

Table 7. Multiple Linear regression model

| | Unstandardized Coefficients | | Standardized Coefficients | T | P. value |
|-------------------|-----------------------------|--|---------------------------|------------------------|----------|
| | B | | β | | |
| Age | .385 | | .374 | 8.133 | .018* |
| Educational level | .793 | | .688 | 8.033 | .009** |
| Residence | .167 | | .134 | 1.460 | .063 |
| Occupation | .754 | | .731 | 10.024 | .004** |
| Total knowledge | 1.699 | | .641 | 15.201 | .000** |
| Model summary | | | | | |
| Model | R | | Adjusted R square | Std. error of estimate | |
| Regression | .894 | | .751 | .434 | |

*P<0.05 (significant) **P<0.001 (highly significant)

Figure 2 distributing of women regarding to practice throughout three phases of the intervention. It was found that there were statistical significant differences between total practice score of the studied mothers throughout three phases of the educational intervention.

Multiple linear regression model of total knowledge was shown in Table 6; there were statistical significant differences between total knowledge score (dependent) and all constant predictors as age, educational level, occupation, and total practice except residence.

Table 7 reveals statistical significant differences between total practice score (dependent) and all constant predictors as age, educational level, occupation, and total knowledge except residence.



Figure 2. Percentage distribution of studied mothers regarding their practice pre, post and follow up (N=80).

Table 8 discovers a highly statistical significant correlation between level of knowledge score and level of practice score (r = 0.974 & p=0.000) respectively.

- a. Dependent Variable: Total knowledge
- b. Predictors: (constant) Age, Educational level, Residence, Occupation and total practice
- a. Dependent Variable: Total practice
- b. Predictors: (constant) Age, Educational level, Residence, Occupation and total knowledge

4. Discussion

Education is the fastest way to promote public health awareness,maternal and child health promotion can be achieved through increasing knowledge and education. Women's knowledge regarding postnatal and newborn care during postpartum period must be raised to increase mothers' confidence regarding the care, reduce traditional false beliefs about postnatal and neonatal care, and reduce morbidity and mortality ratesfor mother and newborn [8].

Table 8. Correlation between total practice and total knowledge

| Items | Total knowledge |
|----------------|-----------------|
| Total practice | r. 0.974 |
| | p. value .000** |

** Highly significant<0.001

The present study revealed age for pregnant women's were 23.7±5.5 years and more than half of them were had a secondary education. This finding was supported **Timilsina & Dhakal [11]** in their study about knowledge on postnatal care among postnatal mother, reported that most of their respondents belong to 22-25 age group and the mean age was 24.12 years. Similarly, **Shahin et al., [12]** who found the mean age of the study sample was

23.41±5.34 years for this reason their knowledge was markedly changed from pretest to the posttest & the follow-up test and this change showed a statistically significant difference. Moreover, **Yadav et al [13]** in Nepal highlighted that the majority of primipara mothers had secondary school education and 8.4% of the mothers were illiterate.

The present study showed that the majority of the studied mothers were housewives. This may be due to most of them were from rural area and cultural beliefs. This result agrees with **Rahayuningsih [14]** who found in his study nearly three quarters of studied mothers were housewives.

Less than one third of the studied women in the current study had previous information regarding postnatal and newborn care and the internet was the most common source of this information and only 20.8% had information from physician. This may be attributed to some communication gap between health professional and the mothers. This finding is in disagreement with **Mandal & Ghosh., [15]** and **Timilsina & Dhakal., [11]** in India and Nepal, who stated that the main source of mothers knowledge in their studies was getting from relatives and friends.

Awareness of the mothers towards postnatal and neonatal care had a lot of lacunae, so there is scope for improvement by providing better care and health education for antenatal mothers at primary care **Menaka, [16]**.

Assess pregnant women's knowledge regarding a selected aspect of postnatal care before and after the educational package is our main target. The present study results revealed that the overall mean score of knowledge related to personal hygiene, episiotomy care, maternal diet, postnatal exercise breast care and postnatal danger signs were improved with a highly significant difference after the implementation of the educational package. This goes in line with a study of **Rahayuningsih, [14]** who emphasized that the highest mean score of knowledge were regarding for breast care, personal hygiene and episiotomy after the intervention program.

Similarly, **Indra [17]** studying effectiveness of self-instructional on knowledge through postnatal care found that self-instructional module was effective for improve knowledge. Additionally, **Patil et al., [7]** found a significant rise in primi postnatal mothers knowledge after the intervention where the mean score of total knowledge at pretest was 9.96 ± 2.75 compared to 17.64 ± 2.49 at posttest which shows that informational booklet was an effective for increasing knowledge. Furthermore, **Shah & Pariyar [18]** reported assess practices regard to postnatal care among mothers residing.

Concerning to pregnant women's knowledge regarding the parameters newborn care, the present study result demonstrated that there was significant enhancement of the participants' knowledge after educational intervention compared to before intervention, where the majority of them had correct answer after educational package intervention regarding to the physiological function of the newborn, umbilical cord care, breast feeding, thermogenic preservation, newborn immunization, newborn danger signs and signs of eye infection. This result demonstrates the success of the educational package, clarity and

consistency of the educational tools that used by the researchers.

In relation to women knowledge about breast feeding, the current study revealed that breast feeding was get highest knowledge between mothers either posttest or follow-up test which in agreement with observation of **Santhi & Kokilavani [19]** who mentioned that the structured teaching was effective in improving the level of knowledge to all mothers which become knowledgeable about breast feeding and its advantages and the difference between the pre and post test scores was highly significant.

The present study clarified that the maintenance of the cord care had a high mean score of knowledge in posttest compared with the pretest. These results revealed that the educational intervention had a significant effect on increasing the mothers' level of knowledge, because lack of knowledge about the cord care affects the mothers' ability to make independent decision on cord care especially among the primipara. Similar study conducted by **Kesterton & Cleland [20]** who reported that, lack of knowledge of standard cord care is an important factor underlying unhygienic umbilical cord management among the mothers. Additionally, **Obimbo et al., [6]** stressed that the least knowledge score found in the pretest regarding the aspect of prevention of cord infection of the newborn.

Concerning thermal protection of the neonates, the results of this study showed statistical significant improvement in mean score of knowledge in mother's primipara during intervention phase. This result in agreement with **Baqui et al., [21]** who clarified that the maintaining of normal body temperature is extremely important in newborn because of their larger body surface area.

Although immunizations does not come under the essential newborn care practices, it is crucial for mother to impart elementary lessons regarding immunization where, better knowledge will improve the vaccine coverage. Therefore, nurses and other health care providers should provide parents with correct information about vaccines. The present study illustrated an improvement in primipara knowledge regard to newborn immunization in posttest and follow up phase. This finding goes in line with **Rama et al., [22]** and **Davis et al., [23]**.

Practice of mothers in postnatal and newborn care are lagging in many aspects such as perineal care, episiotomy care, umbilical cord care, breast feeding practices and eye drop instillation for newborn eye care. All these practices have direct impact on mother and neonatal health status and these lacunae are because of deep rooted cultural and traditional beliefs among care givers and ignorance. Hence to overcome this problem increasing overall educational status of mothers, providing proper health education to them regarding care of her and newborn, and discouraging the unhealthy traditional beliefs are very important.

Integrated approach as good feeding practice, immunization, good hygiene and healthy development could reduce maternal and neonatal mortality. According to findings of the current study there was an improvement in the percentages of satisfactory practices related to selected practices of postnatal and newborn care after the educational intervention. This finding is in accordance with a study of **Abdel-razek [24]** who stated that there was highly statistical significant difference in relation to the variable

concerning the post natal period between pre and post intervention. On the same line, **Mandal & Ghosh [15]** found that most of mothers had satisfactory practice score about newborn care.

With regard to answering the current study hypothesis that the pregnant women who receive nursing educational package regarding postnatal and newborn care will have higher level of knowledge and have a good practice on posttest than pretest. The present study hypothesis has been achieved to a high degree, where the results of the current study indicated a statistically significant improvement in total knowledge and total practice scores where the majority of studied group had unsatisfactory knowledge and practice in pretest which changed minority at immediately post and follow up of intervention respectively. From the researchers' point of view, these improvements may be the result of the educational package given to women. In addition to women enthusiasm for participation in the educational sessions and their readiness for future attendance for the sessions. This finding is in agreement with **Kuo et al., [25]**, **Mozafari et al., [26]** and **Kadam & Tata [27]** in their studies and states that the participants' mothers mainly in pretest had deficient in their knowledge.

Present study reported statistical significant difference between knowledge score (dependent) and constant predictors as practice, demographic data except residence. This finding is in accordance with **Timilsina & Dhakal, [11]** who stated that there is significant association of level of knowledge with selected demographic variables as educational level, occupation and age. Furthermore, the current study also revealed significant differences between practice score and socio-demographic variables except residence. This result comes in disagreement with **Lalitha [28]** who addressed that practice level was better in mothers who were from residential area. Additionally, **Missiriya [3]** found that there was no statistically significant association between the mothers practices with the any of the demographic variables.

The present study stated that there was positive correlation between total knowledge and total practice scores. This because improve knowledge has good effect on improve practice and there is direct relation between knowledge and practice. On the same line **thaiba & Rani [29]** found a positive correlation between total knowledge and practice on selected aspects of postnatal care among postnatal mothers. This disagree with **Castalino et al., [30]** who revealed that a statistically non-significant correlation between knowledge and practice

5. Conclusion

Pregnant women who's subjected to educational package about postnatal and newborn care had improved in their knowledge and practice at the post intervention than pre intervention. As, most of women have had satisfactory knowledge and practices after implementation of educational intervention with statistical significant difference in the posttest and follow up compared with the pretest which justify the study research hypothesis.

6. Recommendations

- Establishing a comprehensive training program for pregnant women especially primiparous at MCH centers are mandatory to improve their knowledge and practices on the different aspects of postnatal and newborn care which can reduce the maternal and neonatal morbidity and mortality rate.
- implementing a training program in the field of maternal postnatal and newborn care for maternity nurses at the antenatal care units is required for educating women on postnatal and newborn care, which is a crucial aspect of women's health and help to reduce maternal and neonatal complications
- A similar study can be replicated in other places and on a larger sample size to strengthen the findings and for the generalization of the findings.

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