ISSN: 2091-2749 (Print)
2091-2757 (Online)

Submitted on: 2025 Aug 4
Accepted on: 2026 Jun 8

https://doi.org/10.3126/jpahs.v13i1.95736

Effectiveness of structured educational program on knowledge regarding newborn care among primi mothers attending in antenatal care outpatient department of a tertiary hospital

Sapana Bhandari[1], Roshani Khatry[2]

[1]MN Student, [2]Assoc. Prof., Lalitpur Nursing Campus, School of Nursing & Midwifery, Patan Academy of Health Sciences, Lalitpur, Nepal

Abstract

Introduction: The neonatal period is a critical phase for extrauterine adjustment. Mothers are the primary caregivers and are often the first to recognize minor changes in the health status of the newborn. This study aimed to assess the effectiveness of a structured educational program on knowledge regarding newborn care among primi mothers.

Method: A pre-experimental one-group pre-test–post-test study was conducted among 49 primi mothers attending the Antenatal Care (ANC) Outpatient Department (OPD) of Patan Hospital. Participants were selected using a convenience sampling technique. Data were collected through face-to-face interviews using a structured interview schedule. A self-developed questionnaire was used to assess knowledge regarding newborn care. Data were analyzed using SPSS version 16. Descriptive statistics and paired t-test were applied for inferential analysis.

Result: In the pre-test, the majority of participants had moderate knowledge (71.43%), followed by inadequate knowledge (26.53%) and adequate knowledge (2.04%). In the post-test, most participants (95.92%) demonstrated adequate knowledge, while 4.08% remained in the moderate category and none had inadequate knowledge. The post-test mean knowledge score (25.96 ± 1.76) was higher than the pre-test mean score (16.42 ± 3.31). A statistically significant difference was observed between pre-test and post-test knowledge scores following the educational intervention.

Conclusion: The structured educational program was effective in improving the knowledge of primi mothers regarding newborn care. These findings highlight the importance of incorporating continuous educational programs during ANC visits to enhance maternal knowledge and promote appropriate newborn care practices.

Keywords: Structured Educational Program; Knowledge; Newborn Care; Primi Mothers

How to Cite: Bhandari S, Khatry R. Effectiveness of structured educational program on knowledge regarding newborn care among primi mothers attending in antenatal care outpatient department of a tertiary hospital. J Patan Acad Health Sci. 2026 Jun;13(1):20-25.

Correspondence: Ms. Sapana Bhandari, Lalitpur Nursing Campus, School of Nursing & Midwifery, Patan Academy of Health Sciences, Lalitpur, Nepal
Email: sapana.bhandari1991@gmail.com

Introduction

The first four weeks of life, known as the neonatal period, is one of the most vulnerable stages of human life and requires intensive care.[1] Newborn care includes essential practices such as maintaining warmth, breastfeeding, hygiene, immunization, cord care, and early identification of danger signs.[2,3] Globally, approximately 2.4 million newborn deaths occur each year, accounting for nearly 6,700 deaths per day. Sub-Saharan Africa contributes about 43% and Southern Asia about 36% of all neonatal deaths worldwide.[4,5] In Nepal, the neonatal mortality rate has shown no improvement, remaining at 21 deaths per 1,000 live births in 2022, similar to the Nepal Demographic and Health Survey (NDHS) 2016.[6]

Many neonatal deaths occurring within the first month of life are caused by illnesses and conditions that could be prevented through improved perinatal care and timely access to skilled health services.[7] The high burden of neonatal morbidity and mortality is often associated with harmful traditional practices such as pre-lacteal feeding (e.g., honey), applying oil or powder to the umbilical cord, use of kajal, application of oil to the eyes, ears, and nose, inadequate covering and exposure of the newborn, and poor hygiene practices.[8,9] These practices may also contribute to long-term complications including neurological impairment and mental retardation, which are largely preventable.[10]

Newborn care practices are strongly influenced by maternal knowledge and experience, particularly among primi mothers who often lack prior exposure to newborn care.[2] Inadequate maternal knowledge may result in inappropriate newborn care practices, thereby increasing the risk of neonatal morbidity and mortality. Improving maternal knowledge is essential, as mothers are the primary caregivers responsible for continuous newborn care.[11] Educational interventions during antenatal visits can enhance maternal knowledge, promote safe newborn care practices, and improve neonatal outcomes. Therefore, this study aimed to assess the effectiveness of a structured educational program on newborn care among primi mothers.

Method

This was a pre-experimental one-group pre-test–post-test study conducted at the Antenatal Care (ANC) Outpatient Department (OPD) of Patan Hospital from August 2022 to April 2024 to assess the effectiveness of a structured educational program on newborn care among primi mothers. Primi mothers with gestational age of 36 weeks and above attending the ANC OPD were included in the study, whereas those aged below 18 years were excluded. A non-probability convenience sampling technique was used to select the participants.

The Sapra (2022) formula was used for calculating the sample size in this study;[12] $n = \frac{[Z_{1-\frac{\alpha}{2}} + Z_{1-\beta}]^2}{d^2} + \frac{Z^2_{1-\frac{\alpha}{2}}}{2}$

Effect size (d) = $\frac{\text{Mean difference}}{\frac{\sigma 1 + \sigma 2}{2}}$

where,

n = required sample size

Z_{(1-α/2)} = Z value corresponding to the level of significance (α) for a two-tailed test

If α = 0.05 → $Z_{(1-\alpha/2)} = 1.96$

Z_{(1-β)} = Z value corresponding to the power of the study

Power = 80% → β = 0.20 → $Z_{(1-\beta)} = 0.84$

Power = 90% → β = 0.10 → $Z_{(1-\beta)} = 1.28$

α (alpha) = probability of Type I error (false positive), commonly 0.05

β (beta) = probability of Type II error (false negative)

(1−β) = statistical power (commonly 0.80)

d = standardized effect size

The sample size was calculated based on findings from a previous study conducted in Karnataka (2016) assessing the effectiveness of a planned teaching program regarding newborn problems among postnatal mothers. [13] The calculated sample size was 46.63. Considering a 10% refusal/non-response rate, the sample size was adjusted to 51.29 (46.63 + 4.66), which was rounded up to 52. Therefore, the final required sample size for the study was 52 participants.

Data were collected using a structured self-developed questionnaire prepared in Nepali with the support of a translator and subject experts. The tool consisted of two parts: Part I included socio-demographic characteristics (age, education, occupation, type of family, and sources of information), and Part II consisted of 30 knowledge-related questions on newborn care focusing on thermal protection, breastfeeding, and newborn danger signs. Each correct response was scored as 1 and incorrect response as 0. Total scores were converted into percentages and categorized as inadequate (<50%), moderate (50–75%), and adequate (>75%).[14]

Pretesting and pilot testing were conducted among 10% of the sample size (n=5). Internal consistency of the questionnaire was assessed using KR-20, which yielded a reliability coefficient of 0.717. The pilot test pre-test mean ± SD was 19.0±13.0, and the post-test mean ± SD was 26.6 ±5.42. Necessary modifications were made to the questionnaire and educational package after pretesting.

Formal administrative approval was obtained from the Research Committee and Dean of Lalitpur Nursing Campus (LNC), School of Nursing and Midwifery (SoNM), Patan Academy of Health Sciences (PAHS) was obtained. Ethical approval was obtained from the Institutional Review Committee (IRC) of PAHS (Ref. PNC2307041762). Written informed consent was obtained from each participant using the institutional generic consent form. Confidentiality was maintained and participants were assured that the information would be used only for research purposes.

Data were collected through face-to-face interviews using the structured questionnaire. Pre-test assessment was conducted in the waiting area of the ANC OPD before or after the doctor's consultation as per participant convenience, ensuring privacy. The pre-test interview required approximately 15–20 minutes. Following the pre-test, a structured educational program was delivered for 25–30 minutes to one or two participants at a time depending on availability. The education session included topics on newborn care, exclusive breastfeeding, timing of feeding, advantages of breastfeeding, hypothermia, hyperthermia, and newborn danger signs, and was delivered using PowerPoint presentation and flip chart. The intervention process was recorded with date and time. Participants were contacted by phone prior to the post-test. Post-test assessment was conducted after 7 days using the same questionnaire.

Data were reviewed, coded, and entered into SPSS version 16. Normality was assessed using the Shapiro-Wilk test, which confirmed normal distribution of the data. Descriptive statistics such as frequency and percentage were used to describe socio-demographic variables. Mean and standard deviation were used to assess pre-test and post-test knowledge scores. Inferential analysis was performed using paired t-test to compare pre-test and post-test mean knowledge scores regarding newborn care.

Result

Pretesting and the educational program was done among 52 participants. Due to attrition of three participants', data analysis was done only among 49 participants.

The mean age of the respondent was 24±0.841. Regarding education, more than half of the participants 28(57.14%) had attained secondary level education, whereas four (8.16%) had no formal education. Similarly majority of the participants, 28(57.14%) belonged to a joint family, Table 1.

Most of the participants were housewives 33(67.35%). Regarding sources of information, the majority 30(61.22%) reported interpersonal communication with family members or relatives as their preferred source. More than half of the participants 26(53.06%) relied on electronic media, while six (12.24%) obtained information from health care professionals.. Newspaper was the least common source, reported by participants , Table 2.

Table 1. Socio demographic characteristics of participants' age, education and types of family (N= 49)

Variables	*f* (%)
Age (years)	
18–23	15(30.61%)
23–28	18(36.73%)
28–33	15(30.61%)
>33	1(2.04%)
Mean age ± SD	24.00 ± 0.84
Education level (NDHS 2021)	
No formal education	4(8.16%)
Basic education	5(10.20%)
Secondary education	28(57.14%)
Higher secondary	12(24.49%)
Type of family	
Nuclear family	18(36.73%)
Joint family	28(57.14%)
Extended family	3(6.12%)

Table 2. Socio demographic characteristics of participants': occupation and sources of information (N=49)

Variables	*f* (%)
Occupation (NDHS 2016)	
Professional	4(8.16%)
Clerical	2(4.08%)
Sales and services	5(10.20%)
Housewife	33(67.35%)
Agriculture	5(10.20%)
Sources of information*	
Newspaper	2(4.08%)
Interpersonal communication (family/ relatives)	30(61.22%)
Electronic media	26(53.06%)
Health care professionals	6(12.24%)

In the pre-test assessment of knowledge regarding newborn care, majority of the participants 35(71.43%) had moderate level of knowledge. A significant proportion 13(26.53%) participants had inadequate knowledge, while only one (2.04%) demonstrated adequate knowledge, scoring above 75%, Table 3.

Table 3. Participants' level of knowledge in pretest (N=49)

Knowledge level	Score range	f (%)
Inadequate (<50%)	0–14	13(26.53%)
Moderate (50–75%)	15–22	35(71.43%)
Adequate (>75%)	23–30	1(2.04%)

In the post-test assessment, the majority of participants 47(95.92%), fell into the adequate knowledge category. Only a small group of two (4.08%) participants, remained in the moderate knowledge. Notably, there are no respondents in the inadequate knowledge category, suggesting that the educational intervention was highly effective in enhancing knowledge level, Table 4.

Table 4. Participants' level of knowledge in post-test (N=49)

Knowledge level	Score range	*f* (%)
Inadequate (<50%)	0–14	-
Moderate (50–75%)	15–22	2(4.08%)
Adequate (>75%)	23–30	47(95.92%)

Table 5. Comparison of pre-test and post-test mean score regarding newborn care among primi mothers (N=49)

Knowledge level	Mean ± SD	Mean difference	Paired t (df)	p value	Eta squared (η^2)
Pre-test	16.42 ± 3.31	-9.54	-20.54 (48)	<0.001***	0.89
Post-test	25.96 ± 1.76	—	—	—	—

***p < 0.001 (Highly significant)

Comparison of pre-test and post-test mean scores showed that before the educational intervention, the mean knowledge score was 16.42±3.31, which improved to 25.96±1.76 after the intervention. The mean difference was 9.54, demonstrating substantial improvement in knowledge. Paired *t*-test analysis revealed that the difference was statistically significant (*t*=-20.54, df=48, *p*<0.001), with a large effect size (η^2=0.89), indicating that the structured educational program was highly effective in improving knowledge regarding newborn care among primi mothers, Table 5.

Discussion

In the present study, the majority of participants (71.43%) had a moderate level of knowledge regarding newborn care during the pre-test. Participants with inadequate knowledge constituted 26.53%, while only 2.04% had adequate knowledge. These findings suggest that primi mothers had only a moderate baseline understanding of newborn care practices prior to the educational intervention.

The findings are supported by a study conducted in Chitwan, Nepal (2022) among 104 postnatal mothers, which reported that 50.96% had moderately adequate knowledge, 45.19% had inadequate knowledge, and 3.84% had adequate knowledge.[14] In contrast, a study conducted in Ludhiana, Punjab among 50 mothers reported that 68% had moderate knowledge, 30% had adequate knowledge, and only 2% had inadequate knowledge.[15] The higher baseline knowledge observed in Ludhiana may be attributed to better educational status and increased exposure to newborn care information. Similarly, a study conducted in Bangalore, India (2018) among 60 antenatal mothers reported even lower baseline knowledge, where 60% had inadequate knowledge and none demonstrated a high level of knowledge.[16]

Following the educational intervention in the present study, 95.92% of participants achieved adequate knowledge, with only 4.08% remaining in the moderate knowledge category. These results are consistent with a study conducted in Kerala, India (2023), where 93% of mothers had adequate knowledge, 6% had moderate knowledge, and 1% had low knowledge after intervention. Likewise, a study conducted in Egypt (2019) among 100 primipara mothers reported that in the post-test, 86% achieved adequate knowledge, 9% had moderate knowledge, and 5% had poor knowledge.[17]

However, the present findings differ from a study conducted in Bangalore among 40 primi mothers, where post-test results showed that 30% had high knowledge and 70% had average knowledge.[16] This variation may be due to differences in educational status of the participants, as most respondents in that study had completed only primary education. Another possible factor contributing to improved post-test performance in the present study is the reminder phone call conducted prior to post-test assessment, which may have reinforced recall and retention of the educational content.

The research hypothesis of the present study was accepted, as the post-test mean knowledge score (25.96) was significantly higher than the pre-test mean score (16.42), with a mean difference of 9.54. These findings are consistent with a study conducted in Puducherry, India among 30 antenatal mothers, where the mean knowledge score increased from 12.43 in the pre-test to 22.32 in the post-test, with a mean difference of 9.89.[18] Similarly, a study conducted in Odisha, India among 41 primi mothers reported a significant improvement in knowledge scores after intervention, with a mean difference of 9.87.[19] The improvement in knowledge across these studies may be due to the use of similar educational content focusing on thermal protection, breastfeeding, and newborn danger signs.

Furthermore, the findings of the present study are supported by another study conducted in Puducherry, India (2019) among 100 antenatal mothers, which demonstrated a significant increase in knowledge scores following intervention.[20] Across these studies, similarities were noted in the target population (primi mothers), duration of educational intervention (approximately 30 minutes), and post-test interval (7 days), suggesting that structured teaching programs are effective in improving newborn care knowledge.

This study had certain limitations. As the study was conducted using a pre-experimental one-group pre-test–post-test design without a control group, the improvement in post-test knowledge cannot be fully attributed only to the structured educational program, as other external factors may have influenced the results. The study was conducted in a single setting at the ANC OPD of Patan Hospital and participants were selected using a convenience sampling technique,

which limits the generalizability of the findings to other settings and populations. Additionally, the post-test was conducted after only seven days, so long-term retention of knowledge and actual newborn care practices could not be assessed. Since data were collected through face-to-face interviews, there is also a possibility of response bias, as participants may have provided socially desirable answers.

Conclusion

The findings of this study revealed that most primi mothers did not have an adequate level of knowledge regarding newborn care during the pre-test. However, following the structured educational program, the majority of participants achieved an adequate level of knowledge in the post-test. A statistically significant improvement was observed in the knowledge scores before and after the intervention. These results indicate that the structured educational program was effective in enhancing the knowledge of primi mothers regarding newborn care and may contribute to improved newborn care practices.

Acknowledgement

I would like to acknowledge to my thesis supervisor, Asst. Prof. Ms. Roshani Khatry for her never ending support and guidance throughout the journey of this study also would like to express the deepest appreciation to all participants who have provided enormous support and cooperation during the study.

Conflict of Interest

None

Funding

None

Author Contribution

Concept, design, planning: SB, RK; Literature review: SB, RK; Data collection/analysis: SB, RK; Draft manuscript: SB, RK; Revision of draft-SB, RK; Final manuscript: SB,RK; Accountability of the work: SB

Reference

1. El-Salam AAA, Eldeeb AME,Saleh ASEM. Effect of Instructional Program on Primipara Mothers' Knowledge Regarding Neonatal Care. Am J Nurs Res. 2019 Mar 14;7(3):256–61. DOI
2. Bhattarai M, Gurung R, Gurung S, Poudel S, Mahato J, Katel K, et al. Knowledge and Practice on Neonatal Care Among Postnatal Mothers in A Selected Teaching Hospital, Kaski District, Nepal. Int J Soc Sci Manag. 25 Jan 2021;8(1):279–84. DOI
3. Sakelo AN, Assefa N, Oljira L, Assefa ZM. Newborn Care Practice and Associated Factors among Mothers of One-Month-Old Infants in Southwest Ethiopia. Int J Pediatr. 20 Oct 2020;2020:e3897427. DOI
4. World Health Organization. Newborn mortality [Internet]. Geneva: World Health Organization; 2024.. [cited 2023 May 16]. Weblink
5. Dol J, Hughes B, Bonet M, Dorey R, Dorling J, Grant A, et al. Timing of neonatal mortality and severe morbidity during the postnatal period: a systematic review. Jbi Evid Synth. 24 Oct 2022;21(1):98–199. DOI
6. Nepal Demographic Health Survey 2022. Ministry of Health and Population, Nepal; New ERA; and ICF. Full Text
7. World Health Organization. Newborn health [Internet]. Geneva: World Health Organization; [cited 2023 Jan 11]. Weblink
8. Bayih WA, Mekonen DK, Kebede SD. Prevalence and associated factors of prelacteal feeding among neonates admitted to neonatal intensive care units, North central Ethiopia, 2019. BMC Public Health. 25 Sep 2020;20:1-11. DOI
9. Rai G, Shrestha M, Pokharel N, Bhandari S. Effectiveness of Educational Intervention on Knowledge Regarding Newborn Care among Nurses Working in Maternity Units of B. P. Koirala Institute of Health Sciences, Nepal. Int J Nurs Res. 2020 Mar 25;6(1):15–9. DOI
10. Godati M, Lavanyauriti, Rani R. Effectiveness of Structured Teaching Programme Knowledge and Practice of Post Natal Mothers Regarding Essential New Born Care. ARC J Nurs Healthc. 2016;2(3):10–6. DOI
11. Pavithra T, Sujitha MS. The Effectiveness of Structured Teaching Programme on Essential Newborn Care among Postnatal Mothers. Pavithra T, Sujitha MS. The Effectiveness of Structured Teaching Programme on Essential Newborn Care among Postnatal Mothers. 2019;11(6):3619-23. Weblink
12. Sapra RL. How to Calculate an Adequate Sample Size? In: Nundy S, Kakar A, Bhutta ZA, editors. How to Practice Academic Medicine and Publish from Developing Countries? A Practical Guide . Singapore: Springer Nature. 2022 [cited 2024 Jan 16]. 81–93. DOI
13. Venu AS, Kumar PRN, Prashanth HM, Sridhara KM. A Study to Assess the Effectiveness of Planned Teaching Programme on Knowledge regarding Common Minor Neonatal Problems and its Management among Postnatal Mothers Admitted in S.S Hospital, Davangere, Karnataka. Int J Nurs Educ Res. 2016;4(2):129-35. DOI
14. Adhikari I. Knowledge on Newborn Care among Primi Postnatal Mother in District Hospital Chitwan, Nepal. Global Journal of Medical Research. 2022;22(5):30-9. Full Text
15. Vinod V. Bagilkar, S. Anuchithra. Descriptive Study on Newborn Care. Asian J. Nur. Edu. and Research. 2014;4(4):383-7. DOI
16. Jadhav J. A Study to assess the effectiveness of Structured Teaching Programme on knowledge and practice of Infant care among Primipara mothers in Indira Gandhi Children Hospital at Bangalore. Int J Nurs Educ Res. 2018 Sep 1;6(3):271–8. DOI
17. El-Salam A, Elmaghawry A, Saleh A. Effect of Instructional Program on Primipara Mothers' Knowledge Regarding Neonatal Care. Am J Nurs Res. 2019 Mar 14;7:256–61. DOI
18. Revathy MV. A study to assess the effectiveness of

educational intervention on newborn care among antenatal mothers at selected hospitals, Puducherry. 2020;6(4):280-2. Full Text

19. Kujur M, Das N, Sahoo P, Bhaktiswarupa S. Effectiveness of comprehensive newborn care package program on knowledge and practice among primi postnatal mothers at selected hospital Odisha. Current Pediatric Research. 2022;26(2):1240-3. DOI

20. Dash MB, Alageswari A, Chitra A F. Effectiveness of prenatal education programme on postnatal and newborn care. Obstet Gynecol Int J. 2019 Nov 4;10(6):383–8. DOI