Effectiveness of a planned teaching programme on knowledge regarding home management of low-birth-weight babies among postnatal mothers in selected maternity hospitals: A pre-experimental study

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Abstract:
Background: Low birth weight (LBW) — defined by the World Health Organization as a birth weight below 2,500 g regardless of gestational age — remains a major contributor to neonatal morbidity and mortality worldwide and disproportionately affects South Asian countries such as India (Wikipedia, 2019; UNICEF-WHO, 2019). Postnatal mothers of LBW babies are frequently unaware of the specific home-care practices needed to protect these vulnerable infants, making structured health teaching an important nursing intervention. Objectives: The study aimed to (1) assess the existing knowledge of postnatal mothers regarding home management of LBW babies, (2) evaluate the effectiveness of a planned teaching programme (PTP) on this knowledge, and (3) determine the association between pretest knowledge scores and selected demographic variables. Methods: A pre-experimental one-group pretest–posttest design was used. Sixty postnatal mothers of LBW babies attending selected maternity hospitals in Miraj, Sangli district, Maharashtra, were enrolled using purposive sampling. Knowledge was assessed using a structured questionnaire covering demographic variables and 30 knowledge items, validated by 14 subject experts and found reliable by the test–retest method ($r = 0.89$). Following the pretest, a PTP on home management of LBW babies was administered, and a posttest was conducted after seven days using the same tool. Data were analysed using descriptive statistics, the paired t-test, and the chi-square test. Results: The mean pretest knowledge score was 12.18 (SD 2.94), which increased to a mean posttest score of 18.36 (SD 2.47), a mean gain of 6.18. The calculated paired t-value (16.44) markedly exceeded the table value (2.001) at $p < 0.05$, indicating a statistically significant improvement in knowledge following the PTP. No statistically significant association was found between pretest knowledge scores and demographic variables including age, education, number of children, family income, source of information, or religion (all χ^2 values below the respective table values). Conclusion: A planned teaching programme is an effective, low-cost nursing strategy for improving postnatal mothers' knowledge of home management of low birth weight babies, independent of their demographic background. Structured teaching should be integrated into routine postnatal nursing care to strengthen maternal competence and, in turn, newborn survival and well-being.

Keywords:
Low birth weight; planned teaching programme; postnatal mothers; knowledge; home management; pre-experimental study.

1. Introduction:

Low birth weight (LBW) is defined by the World Health Organization as a birth weight of 2,499 g or less, irrespective of gestational age. Within this category, very low birth weight (VLBW) refers to a birth weight below 1,500 g, and extremely low birth weight (ELBW) to a birth weight below 1,000 g, whereas normal birth weight at term ranges from 2,500 g to 4,200 g (Wikipedia, 2019).

LBW arises chiefly from two mechanisms: preterm birth, in which the infant is born before completing 37 weeks of gestation and therefore has less time in utero to gain weight, and intrauterine growth restriction (IUGR), in which impaired placental function, maternal illness, or fetal factors slow growth even when the pregnancy reaches term (Stanford Children's Health, 2019). More than 8 percent of newborns in the United States are born with low birth weight, a rate that continues to rise, largely because of the increasing number of multiple-birth pregnancies, which are more likely to end early and to produce smaller infants (Stanford Children's Health, 2019).

A newborn's health is closely tied to the nutritional and general health status of the mother. In India, an estimated 7.5 million babies are born underweight every year, a burden linked to inadequate awareness of essential nutrients such as iron and calcium during pregnancy; this affects not only mothers from economically disadvantaged backgrounds but also financially secure mothers who remain unaware of their nutritional needs (Gupta, 2018).

2. Background of the Study:

A low-birth-weight infant may appear healthy despite a small size, yet remains vulnerable to a wide range of complications: a weaker physiological reserve, difficulty feeding and gaining weight, susceptibility to infection, and difficulty maintaining body temperature owing to minimal subcutaneous fat (University of Rochester Medical Center, 2020).

National data underline the scale of the problem. An analysis reported in the Hindustan Times found that 22 percent of infant deaths in Maharashtra between April 2017 and February 2018 were attributable to preterm birth, with pneumonia, asphyxia, congenital malformation, and other infections accounting for the remaining major causes among the 13,541 child deaths recorded in that period (Aayushi, 2018). An IndiaSpend analysis of census data similarly linked the death of every second newborn in India to either low birth weight or premature delivery, describing this as a reflection of poor maternal health and an inadequate healthcare system; India records an estimated 700,000 neonatal deaths every year, representing 26 percent of the global total according to UNICEF figures (Saha, 2016).

A prospective study conducted in rural Assam compared 30 LBW infants with 30 normal-birth-weight (NBW) counterparts over the first six months of life and found that 77 percent of LBW infants experienced moderate to severe under-nutrition during follow-up, with acute respiratory infection as the predominant morbidity, alongside diarrhoea, skin disorders, fever, and ear disorders (Borah & Baruah, 2015).

3. Need for the Study:

The World Health Organization estimates that roughly 15 million babies are born preterm every year worldwide — more than one in ten of all live births — and that almost one million children die annually from complications of preterm birth. Across 184 countries, preterm birth rates range from 5 to 18 percent, and in India roughly 3.5 million of the 27 million annual births are premature. Preterm birth is now the world's leading cause of neonatal death and the second leading cause of death among children under five, after pneumonia (National Health Portal of India, 2016).

According to joint UNICEF–WHO estimates of low-birth-weight levels and trends for 2000–2015, one in every seven newborns worldwide was born with low birth weight in 2015, placing these infants at elevated risk of death in the first month of life as well as long-term consequences such as stunted growth and reduced IQ. Prevalence varied widely by region, from 7.2 percent in more developed regions to 17.3 percent in Asia, with Southern Asia recording the highest sub-regional prevalence at 26.4 percent — more than five times the rate observed in Eastern Asia (UNICEF-WHO, 2019).

Complications associated with low birth weight include low oxygen levels at birth, difficulty maintaining body temperature, feeding and weight-gain difficulties, infection, immature lung development and respiratory distress, intraventricular haemorrhage, digestive disturbances, and sudden infant death syndrome; long-term sequelae can include cerebral palsy, blindness, deafness, and developmental delay. Regular prenatal care, a healthy maternal diet, and avoidance of alcohol, tobacco, and other substances during pregnancy remain the most effective preventive strategies (University of Rochester Medical Center, 2020).

During clinical practice, the investigator repeatedly encountered postnatal mothers of LBW infants who possessed only limited knowledge of appropriate home-care practices. This observation motivated the present study, which sought to assess mothers' existing knowledge and to evaluate whether a planned teaching programme could meaningfully strengthen it.

4. Conceptual Framework:

The study was guided by the General System Theory proposed by Ludwig von Bertalanffy (1968), which conceptualises any open system — including a nurse–client interaction — as comprising interacting environment, boundary, input, process (throughput), output, and feedback components. This framework was adapted to the present study as follows: the environment was the selected maternity hospitals in Miraj, Sangli district; the boundary comprised the postnatal mothers of LBW babies; the input was the pretest assessment of existing knowledge together with demographic data; the process was the administration of the planned teaching programme followed by structured knowledge assessment; the output was the resulting change (or absence of change) in knowledge; and the feedback loop represented the overall gain — significant or insignificant — in maternal knowledge following the intervention.

5. Objectives of the Study:

1. To assess the existing knowledge regarding home management of low birth weight babies among postnatal mothers.
2. To evaluate the effectiveness of the planned teaching programme regarding home management of low birth weight babies among postnatal mothers.
3. To find the association between pretest knowledge scores and selected demographic variables.

6. Research Question and Hypotheses:

Research question: Does a planned teaching programme have an effect on knowledge regarding home management of low birth weight babies among postnatal mothers?

H0 — There will be no significant difference between the pretest and posttest knowledge scores of postnatal mothers regarding home management of low birth weight babies.

H1 — There will be a significant difference between the pretest and posttest knowledge scores of postnatal mothers regarding home management of low birth weight babies.

H2 — There will be a significant association between pretest knowledge scores and selected demographic variables.

7. Operational Definitions:

Assess: Finding the level of knowledge regarding home management of low birth weight babies among postnatal mothers.

Effectiveness: The desired change brought about by the planned teaching programme, as reflected in posttest scores regarding home management of LBW babies.

Planned teaching programme (PTP): A systematically organised programme designed to impart information and bring about a change in knowledge regarding home management of low birth weight babies among postnatal mothers.

Knowledge: The mothers' understanding regarding home management of low birth weight babies, as measured by the structured knowledge questionnaire.

Low birth weight babies (LBW): Babies weighing 2,500 g or less at birth.

Postnatal mothers: Mothers from immediately after delivery up to 20 weeks postpartum.

Home management: Proper and appropriate care of the low-birth-weight baby provided at home.

Review of Literature

Literature was reviewed under three broad headings: studies related to low-birth-weight babies, studies related to home management of low-birth-weight babies, and studies related to planned teaching programmes as a nursing intervention strategy.

8. Studies Related to Low-Birth-Weight Babies:

A cross-sectional study in Ethiopia using systematic sampling and a structured questionnaire found a 10 percent prevalence of term LBW, with maternal age under 20 years, unintended pregnancy, history of abortion, and abnormal haemoglobin, iron-folic acid, and HIV status identified as risk factors (Weldermariam & Haftu, 2017).

A rural community-based study in Haryana involving 800 subjects across 20 sub-centres reported a 17 percent LBW prevalence and found that infant sex, family type, socioeconomic status, maternal education and occupation, anaemia, and iron-folic acid supplementation significantly influenced birth weight; the authors recommended health education and effective antenatal management to reduce LBW prevalence (Kumar et al., 2017).

A cross-sectional observational study of 149 mothers in a Maharashtra tertiary care hospital, analysed with the chi-square test ($p < 0.05$), found that maternal education, socioeconomic status, parity, gestational weight gain, maternal height, tobacco use, and birth order were significantly associated with LBW (Patale et al., 2018).

UNICEF data indicate that South Asia has the highest LBW incidence globally, with one in four newborns weighing under 2,500 g, alongside the highest rate of infants not weighed at birth (66 percent); low birth weight is described as a strong indicator of maternal and newborn nutrition, with LBW survivors at elevated lifelong risk of impaired immunity, reduced cognitive ability, and adult-onset diabetes and heart disease (UNICEF, 2014).

A retrospective cohort study among Roma and non-Roma mothers in Hungary ($n = 7,756$) found significantly higher preterm birth (9.9% vs 7.1%) and LBW (12.2% vs 6.5%, $p = 0.001$) among Roma women, associated with maternal underweight, advanced maternal age, and smoking; the authors recommended integrated, family- and school-based lifestyle interventions, particularly for Roma communities (Balázs et al., 2013).

A cross-sectional survey of 255 mothers in Nepal using logistic regression reported a 23.1 percent LBW prevalence and identified non-formal employment, vegetarian diet, inadequate rest during pregnancy, ethnicity, religion, and type of delivery as influential factors, underscoring the need for strengthened community-level health education (Koirala & Bhatta, 2015).

A facility-based case-control study in Ethiopia (93 cases, 186 controls) found that lack of iron-folate supplementation, absent nutrition counselling, inadequate snacking, maternal under-nutrition, and anaemia were independently associated with LBW (Shimelis & Teshale, 2019).

A global systematic analysis covering 148 countries estimated worldwide LBW prevalence at 14.6 percent in 2015 (20.5 million live births), down from 17.5 percent in 2000, with 91 percent of LBW births occurring in low- and middle-income countries, chiefly in Southern Asia and sub-Saharan Africa; the authors concluded that meeting the global nutrition target for 2025 would require more than doubling the current rate of progress (Blencowe et al., 2019).

A case-control study of 1,073 mother–infant pairs in South Africa found that 38.5 percent of adult mothers delivered LBW infants, with prematurity, premature rupture of membranes, and fewer than five antenatal visits significantly associated with LBW, reinforcing the protective value of regular antenatal care (Lumbani & Loveness, 2019).

A systematic review of 24 studies on low birth weight, prematurity, and intrauterine growth restriction among indigenous populations (largely from the USA, Canada, and Australia) identified poverty and limited healthcare access as common underlying causes, alongside unfavourable obstetric conditions, maternal malnutrition, smoking, and extremes of maternal age (Barreto, 2018).

9. Studies Related to Home Management of Low Birth Weight Babies:

A qualitative study in two rural Nigerian communities involving 60 mother–infant pairs found that most mothers considered exclusive breastfeeding inadequate for LBW infants and supplemented it with herbal mixtures, forced hand-feeding, and bottle feeding; herbal dressings were also applied for cord and fontanelle care. LBW infants in the study experienced markedly higher mortality (16.7% vs 3.3%) and hospitalisation (40% vs 13.3%) than NBW infants, highlighting the urgent need for culturally sensitive interventions to improve LBW home care (Adejuyigbe et al., 2012).

A systematic review examining Kangaroo Mother Care (KMC) and maternal psychological outcomes found preliminary evidence that KMC can reduce negative maternal mood, such as anxiety and depression, while promoting more positive parent–infant interaction following preterm birth (Fox, 2014).

A qualitative study of 16 Ugandan mothers found that recognising LBW without formal weighing was difficult, and that mothers who delivered in hospital demonstrated better home-care knowledge than those delivering at home. Cord care and thermal care practices were generally adequate, but breastfeeding initiation, exclusivity, and bathing practices were often poor, and LBW status was frequently not recognised as a danger sign warranting medical attention (Waiswa et al., 2014).

A community-based KMC programme across Odisha, Gujarat, and Maharashtra, spanning rural, urban, and tribal populations, found that 80.2 percent of mothers received antenatal KMC education and 55.4 percent initiated KMC within 72 hours of birth, with household duties, nuclear family living, twin pregnancy, and hot weather cited as common barriers to sustained practice — indicating that KMC using existing infrastructure is both feasible and acceptable (Rasaily et al., 2017).

A prospective longitudinal study in a baby-friendly Indian hospital found that exclusive breastfeeding produced weight, length, and head-circumference gains among LBW infants comparable to standard fetal-infant growth norms, supporting exclusive breastfeeding as an effective home-management strategy for LBW infants (Singh & Devi, 2011).

A qualitative study of caregivers and health workers in rural Malawi found that LBW babies were often perceived as weak or developmentally impaired, with discrimination, feeding difficulties, resource shortages, and poor continuity of care identified as major barriers to adequate home management; the authors called for integrated community-based care packages coupled with strengthened facility-level care (Phuka et al., 2017).
A large-scale evaluation of home-based neonatal care (HBNC) across 39 Indian villages, covering 5,919 live births including 2,015 LBW and 533 preterm neonates, found a 58 percent reduction in case fatality among LBW neonates and a 69.5 percent reduction among preterm neonates following implementation, with supportive home-based care contributing to 75 percent of averted deaths — demonstrating that home-based management of LBW and preterm neonates is both feasible and highly effective (Bang et al., 2005).
A randomised controlled trial protocol for very preterm infants proposed a continuous, home-delivered early-intervention programme combining kangaroo care, tactile-kinesthetic stimulation, and structured parental guidance to improve long-term cognitive and motor outcomes, reflecting growing interest in extending structured, low-cost interventions from the facility into the home (Rita & Mendes, 2018).
A comparative study of anthropometric and biochemical parameters among 500 neonates found that preterm and term LBW babies had significantly lower nutrient reserves — including protein, albumin, calcium, and iron — than normal-weight controls, underscoring the importance of targeted nutritional support and monitoring for LBW infants after discharge (Elizabeth & Vijaykumar, 2008).
The World Health Organization continues to work with member states to strengthen preterm birth data systems, update clinical guidelines covering Kangaroo Mother Care, feeding support, infection management, and home-based follow-up, and support implementation of antenatal care guidelines aimed at reducing preterm birth risk (WHO, 2018).

10. Studies Related to Planned Teaching Programmes:

A pre-experimental study in Indore evaluated a structured teaching programme on knowledge of LBW care among 30 postnatal mothers using purposive sampling; posttest scores (mean 17.6) were significantly higher than pretest scores (mean 10.8, $t = 67.6$, $p < 0.001$), and a significant association was found between knowledge gain and demographic variables, confirming structured teaching as an effective strategy for improving maternal knowledge of LBW care (Prabhakaran, 2015).
A study in Chandra Nagar, Dehradun, using a one-group pretest–posttest design with 60 women aged 30–65 years found knowledge of cervical cancer rose from 8.33 percent adequate at pretest to 100 percent adequate at posttest, with a highly significant t-value of 18.65 ($p < 0.05$) (Kaparwan et al., 2017).
A similar evaluative study in Karad, Maharashtra, with 60 women found the mean knowledge score on cervical cancer increased from 7 to 11 (paired $t = 10.2$, $p < 0.05$), with no significant association between knowledge scores and demographic variables, again affirming the effectiveness of planned teaching (Mallikarjun, 2017).
A study in Mangalore assessing PTP effectiveness for exercise-related obesity prevention knowledge among 60 school children found mean posttest scores (20.98) markedly exceeding pretest scores (12.77), with a significant association between pretest knowledge and mothers' educational status ($\chi^2 = 4.444$, $p > 0.05$ threshold noted by authors as approaching significance) (Rajan, 2016).
A quasi-experimental study of 80 family members regarding care of elderly health problems, using a tool with established split-half reliability ($r = 0.7999$), found a marked post-programme shift from predominantly inadequate to predominantly adequate/satisfactory knowledge, confirming the teaching programme's cost-effectiveness and practicality (Gundurao et al., 2018).
A pre-experimental study of 50 family members of elderly persons in Mangalore regarding Alzheimer's disease knowledge found a highly significant increase from a mean pretest score of 12.90 (SD 2.43) to a mean posttest score of 20.78 (SD 3.31; $t = 40.85$, $p < 0.05$), with no significant association between knowledge scores and most demographic variables (Lavina & Mathias, 2016).
A study of 60 first-year B.Sc. Nursing students in Karad regarding needle-stick and sharps injury prevention found improvement from 18.33 percent good pretest knowledge to 28.33 percent good posttest knowledge, with a corresponding decline in poor-knowledge classification from 18.33 percent to 3.33 percent (Chopade et al., 2015).
A study of 30 primary school teachers in Karad regarding child abuse and neglect found a significant increase in mean knowledge score from 9.433 to 16.200 (paired $t = 5.512$, $p < 0.0001$), with significant associations noted for teacher age, marital status, and employment status (Naregal et al., 2015).
A quasi-experimental study of 40 staff nurses regarding thrombophlebitis prevention and management found mean knowledge scores rising from 12.45 to 22.05 following the teaching programme, with the majority of nurses achieving average-to-good posttest knowledge (Babu & Ealias, n.d.).

A quasi-experimental study of 30 first-year nursing students regarding dengue fever prevention found mean posttest knowledge (17.16) significantly exceeding pretest knowledge (11.13, t = 9.57), confirming the PTP as an effective strategy for improving student nurses' preventive knowledge (Shine et al., 2018).

Collectively, this body of literature confirms two consistent patterns relevant to the present study: first, that LBW remains a substantial and multifactorial public-health burden across settings, closely tied to maternal nutrition, antenatal care utilisation, and socioeconomic status; and second, that planned/structured teaching programmes consistently and significantly improve short-term knowledge across highly diverse populations and health topics, lending strong support to the present investigation's central hypothesis regarding home management of LBW babies.

11. Materials and Methods:

11.1. Research Approach and Design:

A quantitative evaluative research approach was adopted, consistent with the study's aim of measuring a knowledge outcome before and after a defined nursing intervention (Polit & Beck, 2008). A pre-experimental one-group pretest–posttest design was used, symbolised as O1 X O2, where O1 denotes the pretest, X denotes the intervention (administration of the planned teaching programme), and O2 denotes the posttest conducted seven days after the intervention.

Variables of the Study

Dependent variable: Knowledge regarding home management of low-birth-weight babies among postnatal mothers.

Independent variable: The planned teaching programme regarding home management of low-birth-weight babies.

Attribute variables: Age, education, number of children, family income, source of information, and religion.

Setting, Population, and Sample

The study was conducted in selected maternity hospitals in Miraj, Sangli district, Maharashtra. The target population comprised postnatal mothers who had delivered babies weighing less than 2,500 g, and the accessible population comprised such mothers attending the selected maternity hospitals during the study period. Sixty postnatal mothers aged 20 years and above constituted the study sample, selected through purposive (non-probability) sampling.

Criteria for Selection of Sample

Inclusion criteria:

- Postnatal mothers who were physically and mentally healthy and able to care for their babies.
- Postnatal mothers who had delivered babies weighing less than 2,500 g.
- Postnatal mothers willing to participate in the study.

Exclusion criteria:

- Postnatal mothers whose LBW infants had associated major congenital anomalies.
- Postnatal mothers experiencing postpartum blues or other postnatal complications.

Development and Description of the Tool

A structured knowledge questionnaire was developed by the investigator following an extensive review of books, journals, and electronic literature, and comprised two sections: Section A collected demographic information across six items (age, education, number of children, family income, source of information, and religion), and Section B contained 30 structured knowledge items assessing knowledge of home management of LBW babies. A correct response was scored 1 and an incorrect response scored 0.

Validity and Reliability

Content validity was established with 14 subject experts, comprising four gynaecologists, one paediatrician, four obstetric and gynaecological nursing experts, one community health nursing expert, two paediatric nursing experts, and two statisticians. Experts evaluated the appropriateness and relevance of each item, and the tool was revised through item addition and deletion based on their feedback. Construct validity was further supported through item analysis. Reliability was established using the test–retest method with six postnatal mothers of LBW babies, yielding a correlation coefficient of r = 0.89, indicating the tool was highly reliable.

Pilot Study

A pilot study was conducted between 18 and 24 October 2019 among six postnatal mothers of LBW babies in a setting distinct from the main study, to establish feasibility of the tool and finalise the data-analysis plan. After obtaining informed consent, the pretest was administered, followed by the PTP on the same day and the posttest seven days later. The pilot confirmed that the tool and procedure were feasible for the main study.

Data Collection Procedure

The main study was conducted by the investigator between 13 November and 13 December 2019 in the selected maternity hospitals. The data-collection procedure comprised the following steps:

- Permission was obtained from the relevant hospital authorities to conduct the research.
- Written informed consent was obtained after explaining the purpose of the study to each participant.
- A pretest was administered, covering demographic data and knowledge regarding home management of LBW babies, using the structured knowledge questionnaire.
- The planned teaching programme was administered immediately following the pretest.
- A posttest was conducted after seven days, using the same tool as the pretest.
- Collected data were tabulated and analysed.

Plan for Data Analysis

Data were organised on a master sheet and summarised using frequencies, percentages, mean, median, and standard deviation. Knowledge scores were classified as poor, average, or good using mean and standard deviation cut-offs. Inferential statistics comprised the paired t-test, used to evaluate the effectiveness of the PTP (H1), and the chi-square test, used to examine associations between pretest knowledge scores and demographic variables (H2).

Ethical Considerations

- Ethical clearance was obtained from the institutional ethics committee.
- Permission was obtained from the concerned hospital authorities prior to data collection.
- Written informed consent was obtained from all willing participants.
- Confidentiality and privacy of participant data were maintained throughout the study.
- The self-respect and dignity of every participant were upheld at all stages of the study.

12. Results:

Findings are organised into four sections: (I) distribution of demographic variables, (II) existing knowledge regarding home management of LBW babies, (III) effectiveness of the planned teaching programme, and (IV) association between pretest knowledge scores and demographic variables.

Section I — Demographic Characteristics of Postnatal Mothers (N = 60)

Table 1. Frequency and percentage distribution of postnatal mothers according to demographic variables (n = 60)

Demographic Variable	Category	Frequency (f)	Percentage (%)
Age (years)	20–24	25	41.67
	25–29	20	33.33
	30–34	12	20.00
	35 & above	3	5.00
Education	Primary	20	33.33
	Secondary	22	36.67
	Graduate	14	23.33
	Post-graduate & above	4	6.67
Number of children	One	23	38.33
	Two	20	33.33
	Three	16	26.67
	Four & above	1	1.67
Family income (Rs./month)	5,000–10,000	22	36.67
	10,001–15,000	31	51.67
	15,001–20,000	5	8.33
	20,001 & above	2	3.33
Source of information	Media	8	13.33

Demographic Variable	Category	Frequency (f)	Percentage (%)
	Friends	27	45.00
	Medical source	2	3.33
	Family members	23	38.33
Religion	Hindu	41	68.33
	Muslim	17	28.33
	Christian	0	0.00
	Others	2	3.33

Table 1 shows that the largest proportion of mothers (41.67%) were aged 20–24 years, while the smallest proportion (5.00%) were aged 35 years and above. Regarding education, 36.67 percent had secondary education and only 6.67 percent were post-graduates. Most mothers (38.33%) had one child, and only 1.67 percent had four or more children. Just over half (51.67%) reported a monthly family income of Rs. 10,001–15,000, while only 3.33 percent reported an income above Rs. 20,001. Friends were the most common source of information (45.00%), followed by family members (38.33%), while medical sources accounted for only 3.33 percent. The majority of mothers (68.33%) were Hindu, 28.33 percent were Muslim, 3.33 percent belonged to other religions, and none were Christian.

Section II — Existing Knowledge Regarding Home Management of LBW Babies

Table 2. Mean, median, and standard deviation of pretest and posttest knowledge scores (n = 60)

Area of Analysis	Mean	Median	Standard Deviation
Pretest (X)	12.18	12.00	2.94
Posttest (Y)	18.36	18.00	2.47
Difference (Y − X)	6.18	6.18	0.47

The overall mean pretest knowledge score was 12.18, which rose to a mean posttest score of 18.36 following administration of the planned teaching programme — a mean gain of 6.18 points.

Table 3. Pretest and posttest knowledge level of postnatal mothers (n = 60)

Knowledge Level	Pretest f	Pretest %	Posttest f	Posttest %
Poor (score 0–9)	7	11.67	5	8.33
Average (score 10–15)	46	76.67	46	76.67
Good (score 16–30)	7	11.67	9	15.00

At pretest, the majority of mothers (76.67%) had average knowledge, with equal minorities (11.67% each) demonstrating poor and good knowledge. At posttest, the proportion with average knowledge remained 76.67 percent, but the proportion with good knowledge rose to 15.00 percent while the proportion with poor knowledge fell to 8.33 percent, reflecting a favourable shift in the knowledge distribution following the intervention.

Section III — Effectiveness of the Planned Teaching Programme

This section tested hypothesis H1: there will be a significant difference between pretest and posttest knowledge scores of postnatal mothers regarding home management of low birth weight babies.

Table 4. Mean difference, standard error, and paired t-value of pretest and posttest knowledge scores (n = 60)

Mean Difference	Standard Error (SE)	Calculated Paired t-value	Table Value (df = 59, p<0.05)

6.18	0.32	16.44	2.001

As shown in Table 4, the calculated paired t-value (16.44) considerably exceeds the table value (2.001) at the $p < 0.05$ level of significance. Hypothesis H1 was therefore accepted, indicating that the gain in knowledge score following the planned teaching programme is statistically significant, and confirming that the planned teaching programme is an effective strategy for improving postnatal mothers' knowledge regarding home management of low birth weight babies.

Section IV — Association Between Pretest Knowledge Scores and Demographic Variables

This section tested hypothesis H2: there will be a significant association between pretest knowledge scores and selected demographic variables.

Table 5. Association between pretest knowledge scores and demographic variables (n = 60)

Demographic Variable	Calculated χ^2	df	Table Value	Result
Age	7.65	6	12.59	Not significant
Education	10.18	6	12.59	Not significant
Number of children	5.37	6	12.59	Not significant
Family income	7.50	6	12.59	Not significant
Source of information	11.69	6	12.59	Not significant
Religion	2.06	4	9.49	Not significant

As shown in Table 5, the chi-square test revealed no statistically significant association between pretest knowledge scores and any of the demographic variables studied — age, education, number of children, family income, source of information, or religion — since all calculated χ^2 values were lower than their respective table values. Hypothesis H2 was therefore rejected, indicating that postnatal mothers' baseline knowledge regarding home management of LBW babies was independent of these demographic characteristics.

13. Discussion:

The present pre-experimental study assessed the effectiveness of a planned teaching programme on knowledge regarding home management of low birth weight babies among 60 postnatal mothers in selected maternity hospitals. The findings are discussed in relation to demographic characteristics, existing knowledge, the effectiveness of the teaching intervention, and the association between knowledge and demographic variables, situated within the context of comparable studies.

With respect to demographic characteristics, the sample was predominantly young (41.67% aged 20–24 years), moderately educated (36.67% with secondary education), and drew information chiefly from informal sources such as friends (45.00%) and family (38.33%) rather than medical sources (3.33%). This pattern of reliance on informal information networks aligns with observations from Uganda, where mothers who delivered outside formal health facilities demonstrated poorer home-care knowledge than those who delivered in hospital (Waiswa et al., 2014), and from Nigeria, where sociocultural beliefs rather than medical guidance shaped LBW feeding and care practices (Adejuyigbe et al., 2012). This underlines an ongoing need for nurses and health systems to become a more prominent and trusted source of information for postnatal mothers.

Regarding existing knowledge, the majority of mothers (76.67%) demonstrated only average knowledge at pretest, with poor and good knowledge each represented in a small minority (11.67%). This finding is broadly consistent with reports from other planned-teaching-programme studies conducted before intervention, where baseline knowledge across diverse health topics — from cervical cancer (Kaparwan et al., 2017; Mallikarjun, 2017) to child abuse and neglect (Naregal et al., 2015) to Alzheimer's disease (Lavina & Mathias, 2016) — has typically clustered at the low-to-average range, reflecting a widespread gap between community awareness and structured health education.

Regarding the effectiveness of the teaching intervention, the present study found the mean posttest knowledge score (18.36) to be significantly higher than the mean pretest score (12.18), with a calculated paired t-value of 16.44 exceeding the table value of 2.001 at $p < 0.05$. This mirrors the earlier pre-experimental study conducted in Indore, which similarly found a significantly higher posttest knowledge score (mean 17.6) than pretest score (mean 10.8) among postnatal mothers regarding LBW care, with a t-value of 67.6 ($p < 0.001$) (Prabhakaran,

2015). Comparable magnitudes of improvement have also been documented for structured teaching on cervical cancer, where posttest knowledge rose from 8.33 percent adequate to 100 percent adequate (Kaparwan et al., 2017), and for Alzheimer's disease knowledge among family caregivers, where posttest scores nearly doubled the pretest mean (Lavina & Mathias, 2016). Taken together, these consistent, cross-topic findings strongly support planned/structured teaching as a robust and generalisable nursing strategy for producing short-term knowledge gains, irrespective of the specific health topic addressed.

Regarding the association between pretest knowledge and demographic variables, the present study found no statistically significant association with age, education, number of children, family income, source of information, or religion. This finding contrasts somewhat with the Indore study, which reported a statistically significant relationship between knowledge score and demographic variables (Prabhakaran, 2015), but is consistent with the Karad cervical-cancer study, which likewise found no significant association between knowledge score and demographic characteristics (Mallikarjun, 2017), and with the Alzheimer's disease study in Mangalore, where the majority of demographic variables also showed no significant association with knowledge scores (Lavina & Mathias, 2016). This variability across studies suggests that the relationship between demographic background and baseline health knowledge is context- and topic-dependent, and that structured teaching interventions may be broadly beneficial across demographic subgroups rather than needing to be narrowly targeted.

Overall, the present findings reinforce the broader literature's conclusion that planned teaching programmes are an effective, low-resource, and widely applicable nursing intervention for improving maternal and caregiver knowledge across a wide range of health conditions, and specifically confirm their value in strengthening postnatal mothers' knowledge of home management of low birth weight babies.

14. Conclusion:

The knowledge of postnatal mothers in the selected maternity hospitals improved markedly following the planned teaching programme on home management of low birth weight babies. The statistically significant gain in knowledge scores (mean gain 6.18; paired $t = 16.44$, $p < 0.05$) demonstrates that structured teaching is an effective means of equipping postnatal mothers with essential home-care knowledge, and that this effectiveness holds regardless of the mothers' age, education, family size, income, information source, or religion. Awareness of such home-management practices is essential to sustaining high standards of newborn care and, ultimately, to improving outcomes for low birth weight infants after hospital discharge.

Nursing Implications

The findings of the study carry implications across the domains of nursing practice, education, administration, and research.

Nursing Practice

The results equip nurses with evidence to strengthen community awareness of LBW risk factors, warning signs, newborn care, feeding techniques, and personal hygiene, helping postnatal mothers navigate this critical period safely.

Nursing Education

As nursing education continues to evolve, and as India's nurses increasingly provide care worldwide, greater curricular emphasis on health promotion and disease prevention — including home management of LBW babies — is warranted. Study findings can serve as illustrative teaching material to raise student awareness of this topic and, in turn, better prepare them to educate postnatal mothers.

Nursing Administration

Findings can inform in-service education programmes for auxiliary nurse-midwives, staff nurses, and supervisors, updating their knowledge of LBW home management so that this knowledge can, in turn, be transferred effectively to postnatal mothers.

Nursing Research

As a fundamental prerequisite for professional advancement, nursing research identifies, describes, explains, predicts, and helps control health phenomena. The present study provides a foundation and encouragement for further research on LBW babies across different settings and samples.

Limitations of the Study

- Findings cannot be generalised beyond the study context, as the research was conducted in selected hospitals with a purposive sample.
- The study was time-bound, limiting longer-term follow-up of knowledge retention or infant outcomes.
- The study was restricted to the knowledge domain and did not assess attitudes or practices.

Recommendations for Future Research

- A similar study may be replicated with a larger, randomly selected sample so that findings can be generalised to a wider population.
- A comparative study could be conducted across rural, urban, and tribal populations.
- Future research could evaluate attitudes and practices, not only knowledge, regarding home management of LBW babies.
- A similar study could be undertaken with the aim of developing an informational booklet for postnatal mothers.
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15. References:

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