# "EFFECT OF HEALTH EDUCATION ON KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING POSTNATAL CARE AMONG RURAL PREGNANT WOMAN – AN INTERVENTIONAL STUDY"

**Submitted by**

**(REG. NO.BD0122004)**

# Dissertation

*Submitted to*
*KAHER, Belagavi, Karnataka,*
*In partial fulfilment of requirements for the degree of*

**M. D. (Doctor of Medicine)**

**In**

**COMMUNITY MEDICINE**

**DEPARTMENT OF COMMUNITY MEDICINE,**
**JAWAHARLAL NEHRU MEDICAL COLLEGE, KAHER,**
**BELAGAVI, KARNATAKA – 590010**

**AUGUST 2025 / SEPTEMBER 2025**

**KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH, BELAGAVI**

## *Endorsement by the HOD & Principal / Head of the Institution*

"This is to certify that the dissertation entitled **"EFFECT OF HEALTH EDUCATION ON KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING POSTNATAL CARE AMONG RURAL PREGNANT WOMEN – AN INTERVENTIONAL STUDY"** is a bona fide research work done by the candidate **REG. NO. BD0122004** .


**Dr. GIRIJA J. MAHANTSHETTI** MD
Professor and Head,
Department of Community Medicine,
J. N. Medical College, KAHER,
Belagavi – 590010,
Karnataka, India.

Place: Belagavi
Date: 19|2|25

**Dr. N.S. MAHANTSHETTI** MD
Principal,
J. N. Medical College, KAHER,
Belagavi – 590010,
Karnataka, India.

Place: Belagavi
Date: 19|2|25

# UNDERTAKING

**"I, Reg. No. BD0122004,** hereby declare that the information and the data mentioned in my dissertation entitled **"Effect of Health Education on Knowledge, Attitude and Practices Regarding Postnatal Care Among Rural Pregnant Women – An Interventional Study"** belongs to me and is original. I am aware of the definition of plagiarism as detailed below:

- An act or instance of using or closely imitating the language and thoughts of another author without authorization and the representation of that author's work as one's own, as by not crediting the original author.
- A piece of writing or other work reflecting such unauthorized use or imitation.
- The deliberate or reckless representation of another's words, thoughts, or ideas as one's own without attribution in connection with the submission of academic work, whether graded or otherwise.

I hereby declare that the dissertation prepared by me is original-one and does not involve plagiarism anywhere. In case at a later stage, it is found that I have indulged in plagiarism, then I am solely responsible for the same and the institution is at liberty to take any disciplinary action against me including cancellation of the dissertation or any other penalties imposed by the University.

Date: 19/02/2025

Place: Belagavi **(REG. NO.BD0122004)**

# PLAGIARISM ACCEPTED LETTER


**JAWAHARLAL NEHRU MEDICAL COLLEGE**

(A constituent unit of KLE Academy of Higher Education & Research Deemed-to-be-University)

(Recognized by National Medical Commission, New Delhi)

**Accredited 'A+' Grade by NAAC (3rd Cycle)** **Placed in Category 'A' by MoE (GoI)**

*Nehru Nagar, Belagavi- 590 010, Karnataka, INDIA*

0831 - 2471350 0831 - 2470759 www.jnmc.edu incipal@jnmc.edu


Ref No: MDC/PG/ Date: 14-02-2025

## "ACCEPTANCE LETTER"

The softcopy of thesis entitled: **"EFFECT OF HEALTH EDUCATION ON KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING POSTNATAL CARE AMONG RURAL PREGNANT WOMEN - AN INTERVENTIONAL STUDY"** has been submitted for anti-plagiarism check through Turnitin software. The scan has been carried out and the scanned output reveals a match percentage of **04%** which is within the acceptable limits of **10%** as per the guidelines given by UGC.

**Guide.**

KAHER BELAGAVI J. N. MEDICAL COLLEGE

**Dr. (Mrs.) N.S. Mahantashetti.**
Chairperson-Antiplagiarism Committee &
Principal,
J. N. Medical College, Belagavi.

To,
**Reg. No. BD0122004**
Postgraduate Student,
2022-23 Batch,
Department of Community Medicine
J. N. Medical College, Belagavi.

# ETHICAL CLEARANCE LETTER

K.L.E. ACADEMY OF HIGHER EDUCATION AND RESEARCH
(Deemed – to- be- University)
Accredited 'A+' Grade by NAAC in (3rd Cycle) Placed in Category 'A' by MHRD (GoI)

**JNMC INSTITUTIONAL ETHICS COMMITTEE**
**JAWAHARLAL NEHRU MEDICAL COLLEGE,**
**NEHRU NAGAR, BELAGAVI-590010 (KARNATAKA-INDIA)**

Website: http//www.jnmc.edu
E-Mail : dome@jnmc.edu

Phone: (+ 91-(0)831 Office : 2472550
Principal: 2471701
Fax No. +91 (0)831 – 2470759

**Ref No.MDC/JNMCIEC/** 49 **Date: 01/04/2023**

To,
Reg. No BD0122004
PG Student in Community Medicine
J. N. Medical College,
BELAGAVI.

Sub: Institutional Ethical Clearance for the study.

With reference to the above, we wish to inform you that your proposed research project titled **"EFFECT OF HEALTH EDUCATION ON KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING POSTNATAL CARE AMONG RURAL PREGNANT WOMEN-AN INTERVENTIONAL STUDY",** is ethical and justifiable. The proposed research project has been cleared by the JNMC Institutional Ethics Committee.

**(Dr. Smita Sonoli)**
Member Secretary
JNMC Institutional Ethics Committee
J.N.Medical College, Belagavi.

**(Dr. Harsha Hegde)**
Chairman,
JNMC Institutional Ethics Committee
J.N.Medical College, Belagav

# LIST OF ABBREVIATIONS USED

| S. No. | Abbreviations | Expansion of the Abbreviations |
|---|---|---|
| 1. | PNC | Postnatal Care |
| 2. | ANC | Antenatal Care |
| 3. | WHO | World Health Organization |
| 4. | NFHS | National Family Health Survey |
| 5. | SDG | Sustainable Development Goals |
| 6. | NIPI | National Iron Plus Initiative |
| 7. | IFA | Iron and Folic Acid |
| 8. | NIS | National Immunization Schedule |
| 9. | BCG | Bacillus Calmette-Guerin |
| 10. | OPV | Oral Polio Vaccine |
| 11. | Hep B | Hepatitis B Vaccine |
| 12. | f-IPV | Fractional dose – Inactivated Polio Virus |
| 13. | RVV | Rota Virus Vaccine |
| 14. | PCV | Pneumococcal Vaccine |
| 15. | IUD | Intrauterine Device |
| 16. | IPHS | Indian Public Health Standards |
| 17. | RCT | Randomized Control Trail |
| 18. | IEC | Information Education Communication |
| 19. | NICU | Neonatal Intensive Care Unit |
| 20. | OCP | Oral Contraceptive Pills |
| 21. | Cu T | Copper T |
| 22. | KAP | Knowledge, Attitude, and Practice |
| 23. | ASHA | Accredited Social Health Activist |
| 24. | ANM | Auxiliary Nurse Midwife |
| 25. | HIOs | Health Inspecting Officer |
| 26. | HCW | Health Care Worker |
| 27. | LHV | Lady Health Visitor |
| 28. | POG | Period of Gestation |
| 29. | KAHER | KLE Academy of Higher Education and Research |

| | | |
|---|---|---|
| 30. | IEC | Institutional Ethics Committee |
| 31. | JNMC | Jawaharlal Nehru Medical College |
| 32. | PHC | Primary Health Centre |
| 33. | HBNC | Home-Based Newborn Care |
| 34. | SPSS | Statistical Package for Social Sciences |
| 35. | AOR | Adjusted Odds Ratio |
| 36. | CPI | Consumer Price Index |
| 37. | CPI-IW | CPI for Industrial Workers |
| 38. | SES | Socio-Economic Status |
| 39. | INR | Indian Rupee |

# ABSTRACT


## "EFFECT OF HEALTH EDUCATION ON KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING POSTNATAL CARE AMONG RURAL PREGNANT WOMAN – AN INTERVENTIONAL STUDY"

**Background and Objective**

The postnatal period is vital for both mothers and newborns health, particularly in developing nations. High maternal mortality poses serious risks to both maternal and infant survival. Postnatal care involves providing comprehensive healthcare services, educational programs and robust community support. These strategies are essential in reducing maternal and neonatal mortality and morbidity, ultimately improving overall health outcomes. This study aimed to evaluate the effect of health interventions on the knowledge, attitudes and practices related to postnatal care among pregnant women in rural communities.

**Methods:**

An interventional study with 312 participants divided into two groups (Control and intervention) collected sociodemographic data using a predesigned, well-structured questionnaire from April 2023 to March 2024. The intervention group, consisting of women with gestational ages $\geq$ 34 weeks received health education on postnatal care through PowerPoint presentations , handouts, videos (latching technique, newborn care, and recognizing danger signs) as per WHO guidelines. After 42 days of postpartum knowledge, attitude and practice of intervention and control group was assessed using structure questionnaire during immunization clinic.

The unpaired t-Test was compared Knowledge scores between the intervention and control groups, while the Mann-Whitney U test was utilized for Attitude and Practice scores, as normality was not met based on the Kolmogorov-Smirnov test results.

**Results:**

The average age group of the mother both groups was between 21 to 25 years of age , with the intervention group showing a greater percentage of educated mothers 46.2% versus 37.2% in the control group. The intervention group demonstrated high awareness regarding postnatal visits, breastfeeding practices, and nutrition which was significant. Knowledge levels were markedly higher with 92.3% aware of the importance of exclusive breastfeeding compared to 40.4% in the control group. The findings also highlighted a significant increase for postnatal visits within the intervention group (98.7%) versus the control group (49.4%). Overall, the effectiveness of the intervention enhanced participants knowledge, attitudes, and practices concerning postnatal care and child health. Even though the knowledge about PNC is significantly higher in intervention group but failed to show significant correlation between knowledge and attitude; knowledge and practice.

**Conclusion:**

This study emphasizes on improving postnatal care, especially in rural areas to reduce preventable maternal and child deaths. This study provides a foundation for future research with larger, multicentric samples.

**Keywords:** Postnatal care, Newborn care, Breastfeeding

# TABLE OF CONTENTS

# LIST OF TABLES

# LIST OF FIGURES

# INTRODUCTION

The postnatal period is defined as the period that begins immediately following the birth of a baby and extends up to six weeks (42 days) after birth, a critical phase for women, newborns, and their caregivers. This period continues to bear a substantial impact on maternal and neonatal mortality and morbidity, with postpartum deaths representing up to 30% of all maternal deaths. In addition, infant mortality rates are substantially elevated during first month of life, reaching 17 deaths per 1,000 live births globally in 2019. The median coverage rate for routine postnatal care within two days of delivery significantly lags behind the global 2025 targets.[1]

First 24 hours after delivery accounts a significant percentage of maternal and newborn deaths. Essential postnatal care is crucial for both the mother and the newborn. Postnatal care helps with delivery-related complications and provides the mother with vital information regarding healthy behaviours, preventing illnesses, and identifying and managing issues in the first six weeks after delivery. Promoting and encouraging exclusive breastfeeding, keeping the infant warm, proper hand washing, skin care and umbilical cord care are all essential components of basic newborn care.[2]

Health promotion initiatives focus on improving postnatal care quality for both women and newborns by enhancing essential care throughout the postpartum period. A " Positive Postnatal Experience " is an important outcome for all women who have given birth and their infants, establishing the foundation for enhanced health and wellness in the immediate and extended future. WHO describes postnatal care phase as the most pivotal and unnoticed stage of mother and infant. A significant proportion of mortalities transpire during this period.[1]

Postnatal care encompasses postnatal check-ups, identification of danger signs, breastfeeding support, newborn care, immunization, personal hygiene, nutrition guidance and family planning counseling.[3]

Postpartum women and newborns should ideally receive at least 4 postnatal visits - within 24 hours, between 48 and 72 hours, between 7 and 14 days and at 42 days postpartum. Although most maternal and infant deaths occur within first six weeks after delivery, this critical period remains underserved in terms of quality care.[1,2]

Excessive bleeding, i.e., soaking more than 2-3 pads in 20-30 minutes after delivery, yellow colored urine, pale skin or eyes, giddiness or weakness, cracked and painful nipples, convulsions, fever, swelling on face, hands and legs, severe abdominal pain, difficulty in breathing, foul-smelling lochia, inability to pass urine after delivery, abnormal behaviour, burning micturition along with pain and swelling in lower limbs, dribbling or leakage of urine, incontinence of stool are some of the potential danger signs during the postpartum period.[4] Mothers should be informed of this possibility and advised to seek immediate medical attention if these symptoms arise. National Iron Plus Initiative (NIPI) aims to address Iron Deficiency Anemia holistically across all stages of life, particularly focusing on adolescents and non-pregnant, lactating women in their reproductive years. To lower the incidence of postnatal anemia, women should consume oral IFA supplementation for 180 days after delivery.[5]

Breastfeeding offers benefits for both mothers and newborns. Mothers who breastfeed have a reduced risk of developing breast and ovarian cancers and Type 2 Diabetes.[6] Healthcare providers should evaluate breastfeeding latch, nipple type and condition. Unless medically contraindicated, healthcare providers should strongly encourage breastfeeding.[7] Breast milk provides infants with optimal nutrition and

infection protection due to its natural composition and superior nutrient profile.[8] The World Health Organization (WHO) recommends initiating breastfeeding within the first hour of life and exclusively breastfeeding for the first six months to ensure optimal infant growth and development.[2]

Women should be educated to eat a well-balanced diet and resume normal eating habits.[9] Breastfeeding women are advised to increase their daily caloric intake by 500 calories. Strenuous activity should be avoided in the early postpartum period, with ample rest recommended for the first 2-3 weeks. Exercise should be gradually resumed, starting with low-impact activities like walking.[10]

A nation's socioeconomic status and quality of healthcare can be inferred from its neonatal death rates. During first 28 days of life, newborns require special attention to increase their chances of survival because this is the most common time for infant death.[11] Newborn care includes ensuring the baby stays warm, initiating breastfeeding within the first hour, providing exclusive breastfeeding, delaying bathing for 48 hours, keeping the umbilical cord dry, protecting the baby from sick individuals and providing specialized care for low-birth-weight infants (less than 2.5 kg). Rapid breathing, difficulty breathing, yellow palms and soles, bloody stools, fever and sucking weakly or refusing to breastfeed are potential warning signs in newborns.[12]

Practices that are considered inappropriate such as delaying the initiation of breastfeeding, early bathing, not seeking medical care when newborns are ill and applying harmful substances to the cord stump, significantly increase the risk of newborn mortality.[3]

The Home-Based Newborn Care (HBNC) program utilizes Accredited Social Health Activists (ASHAs) to conduct home visits to mothers and newborns at 3, 7, 14, 21, 28 and 42 days postpartum. This community-level intervention significantly reduces neonatal and infant mortality rates addressing the critical periods of high risk.[13]

Immunization is an effective preventive healthcare measure for children. For maximum effectiveness, vaccines must be administered to children at the correct age and dosage, as children are susceptible to specific illnesses at particular ages.[14] First six weeks of a newborn's life are the target period for administering Bacille Calmette-Guerin (BCG), Oral Polio Vaccine (OPV), Hepatitis B, Pentavalent - 1, Rotavirus vaccine 1 (RVV-1), Fractional Inactivated Polio Vaccine 1 (fIPV) and Pneumococcal Vaccine 1(PCV). Newborns should receive complete vaccinations as outlined in the National Immunization Schedule (NIS).[3]

Postpartum contraception discussions are best initiated during the perinatal period. Intrauterine devices (IUDs) are optimally inserted 4 to 6 weeks after delivery. Barrier methods, copper-releasing and hormone-releasing IUDs and progestin-only contraceptives are suitable for both breastfeeding and non-breastfeeding women; however, non-hormonal options are generally preferred.[2,12]

Studies in southern Ethiopia reveal that 95% of postpartum women (aged 0-12 months) wish to avoid pregnancy for next two years, only 30% utilize contraception. This high rate of unintended pregnancies leads to increased adverse health outcomes for both mothers and infants. In low-resource settings, postpartum family planning offers a dual benefit: reducing maternal mortality and contributing to population control. Integrating family planning into a comprehensive public health strategy is crucial for achieving sustainable development goals.[15]

Global health initiatives now prioritize not only maternal and newborn survival but also their optimal health and well-being. High-quality healthcare throughout pregnancy, childbirth and the postnatal period is crucial for achieving global agendas and Sustainable Development Goals (SDGs). The goal is to reduce global maternal mortality rate to below 70 per 100,000 live births and to guarantee universal access to reproductive healthcare services, including family planning, information, education and the integration of reproductive health into national health strategies.[16]

Numerous studies highlight substantial knowledge gaps concerning postnatal care, breastfeeding, recognizing warning signs, newborn care, immunization and family planning services.[17] Given that two-thirds of maternal deaths occur during postpartum, posing risks to both mother and newborn, thereby health interventions are crucial in developing countries to improve maternal and neonatal health and survival.[18]

This study aims to improve postnatal care by integrating healthcare services, education and community support to promote the well-being of mothers and newborns in primary care settings. This approach is expected to significantly lower maternal and neonatal mortality and morbidity, leading to better overall health outcomes.

# OBJECTIVES

1. To assess the effect of health education on knowledge, attitude and practices regarding postnatal care among rural pregnant women.
2. To determine the factors influencing postnatal care among rural pregnant women.

# REVIEW OF LITERATURE

## Background

Care of the mother and the newborn after delivery is known as postpartum care. It focuses on preventing complications during postpartum period, facilitating the mother's swift recovery to optimal health, assessing breastfeeding adequacy, offering family planning services and essential health education to mothers and their families.[3] Common complications that may arise during postpartum period include puerperal sepsis, urinary tract infections, breast infections, venous thrombosis, pulmonary thromboembolism, puerperal haemorrhage, urinary incontinence and psychiatric disorders.[4]

Globally, postnatal care is acknowledged for safeguarding and enhancing health of mother and newborn. It allows healthcare professionals to encourage exclusive breastfeeding, promote personal hygiene, advise on appropriate feeding practices and offer family planning counselling.[1]

PNC provides valuable opportunity to assess how well the mother is bonding with her baby, especially regarding feeding. It gives complete nutrition for infants up to six months, half their needs from six to twelve months. It contains essential nutrients and has anti-infective properties, protecting against infections. Moreover, it is easily digestible, safe and incurs no extra costs for families.[19]

Every effort should be made to encourage mothers who visit postnatal clinics to choose an appropriate method for spacing future pregnancies or limiting family size, depending on their circumstances. While breastfeeding offers some degree of safety against pregnancy, it should not be relied upon solely, therefore contraceptives should be provided immediately after childbirth.[3]

The skills of the healthcare provider significantly influence their capability to diagnose issues and suggest suitable treatments or referrals. In India, less than half (43%) of women had their first postnatal check-up with a doctor, 26% received care from an ANM, nurse, midwife or LHV, while 12% consulted an ASHA.[2]

Early detection and prompt interventions are vital in preventing complications for both mother and newborn. Postnatal care comprises adequate postnatal visits, knowledge of postnatal danger signs and newborn danger signs, breastfeeding and immunization. Inadequate postnatal care represents a missed opportunity to support the physical, mental and sexual health of mothers which can have harmful effects on the mother, the baby and the entire family.[20]

A brief review is conducted to highlight the significance of postnatal care for mothers and newborns.

**Postnatal Care**

In Puducherry, a cross-sectional study was done among the postnatal mothers in the community to assess postnatal care. Mothers aged above 18 years who had registered for antenatal care in two selected urban PHCs were the participants. A pretest was conducted using the questionnaire according to Indian Public Health Standards (IPHS) guidelines. The findings revealed that immediate postnatal care and counseling services provided at place of delivery were adequate. However, postnatal home visits and newborn care counseling were lacking. When related to antenatal care, the importance of PNC is relatively lower. As a result of the study, Postnatal care should be taught to the patient to detect early postnatal complications and prevention of avoidable maternal and neonatal deaths during the postnatal period.[21]

A qualitative evidence synthesis analyzed 59 articles (from 12,678 screened) exploring women's experiences with routine postnatal care. Using a framework analysis, five key themes emerged: access/availability, resources (physical and human), external influences, social norms, and experience of care. High-confidence findings revealed perceptions of low postnatal care value for healthy individuals, concerns about access and quality, and a strong desire for emotional and psychosocial support. These findings highlight missed opportunities for promoting and ensuring continuous postnatal care. Women's postnatal care utilization is influenced by interconnected factors including access, quality and social norms with a consistent need for emotional support. The study concluded that future research and programs should address these complicated needs holistically.[22]

A randomized control trial with 229 pregnant women was conducted to assess the effect of health education (via social media) on knowledge of postnatal care. In this study, participants were divided into two groups: control and interventional. They provided routine care to control group and health education to intervention group (16-minute video on Postnatal care). The study findings show that intervention group's mean knowledge score increased (8.07 points) when compared to control group. Knowledge of maternal care increased (4.31 points) and knowledge of newborn care increased (3.39 points) among pregnant women in intervention group compared to control group. A social media-based, health education program effectively enhances PNC knowledge scores among pregnant women. Further research was necessary to determine whether this increased knowledge leads to higher utilization of PNC services.[23]

**Postnatal danger signs**

In Nepal municipalities, a cross-sectional study assessed postnatal danger sign awareness among 527 mothers using stratified random sampling. Data collected via structured interviews revealed that only 39.7% of participants demonstrated adequate knowledge (identifying at least three common danger signs), though most recognized vaginal bleeding. Multivariate logistic regression analysis using SPSS indicated that modern healthcare-seeking behaviour, service-sector employment and shorter travel time to healthcare facilities were significantly associated with better knowledge of postnatal danger signs. To improve awareness, targeted health education during pregnancy and childbirth is crucial, utilizing local-language Information Education Communication (IEC) materials. Further qualitative and interventional studies were recommended to refine understanding and evaluate educational strategies.[24]

In Uganda, a cross-sectional study investigated factors influencing awareness of postnatal danger signs among 358 primiparous women at Tororo General Hospital. Interviewer administered questionnaires revealed that only 63.4% could identify at least one sign. Multivariate logistic regression analysis showed that higher education levels (secondary/tertiary), attending multiple antenatal care visits (more than four) and access to information resources were significantly associated with improved awareness. These results demonstrate a significant deficit in knowledge regarding postnatal danger signs among first-time mothers, emphasizing the need for improved health education initiatives.[25]

**Breastfeeding**

In Jammu and Kashmir, a cross-sectional study of 108 postnatal mothers was conducted in the Shopian district to assess their knowledge, attitudes, and infant feeding practices. A semi-structured questionnaire was used to collect data. The study findings revealed that only a small percentage (21.3%) of postnatal mothers knew about early breastfeeding, exclusive breastfeeding, burping, breastfeeding on demand and not giving pre-lacteal feeds. In terms of breastfeeding behaviour, postnatal mothers believe that breastfeeding affects their beauty, that they should stop breastfeeding while weaning, and that formula feeding is more convenient than breastfeeding. In terms of practice, <10% of mothers began early breastfeeding in an hour, while <40% began late supplementary feeding. The study concludes that there was lack of knowledge, attitude and practice regarding breastfeeding among postpartum women.[26]

In Uttar Pradesh, a prospective cross-sectional was done for 200 mothers attending the Obstetrics and Gynaecology Department, at Sharda University. Following the informed consent, mothers underwent interviews aimed at assessing their knowledge, attitudes and practices related to breastfeeding. This study found that 52.5% of mothers were primigravid and 79.64% unemployed. Among the 200 participants, 102 received antenatal care and 89 received breastfeeding counselling. Only 38.3% initiated breastfeeding in an hour of delivery while 47.91% discarded colostrum and 57.19% provided additional feeds like water or cow's milk. 46.33% recognized importance of exclusive breastfeeding for neonatal development, and 64.8% were unaware of its non-nutritive benefits, such as bonding and warmth for newborns. Many Indian mothers lack adequate knowledge and ideal breastfeeding practices. Addressing

this gap through counselling and health awareness programs led by community health workers like ASHA workers and Anganwadi teachers is essential.[27]

In Varanasi, cross-sectional study was conducted among women attending the Department of Obstetrics & Gynaecology at S.S. Hospital, Banaras Hindu University. The study involved face-to-face interviews using pre-designed, self-administered questionnaire to assess knowledge, attitudes and practices related to breastfeeding. Concerning knowledge and attitudes towards breastfeeding, the majority (71.4%) viewed breast milk as the best food for newborns, with a higher rate (86%) among younger women under 20 years. In terms of breastfeeding behaviour, only 45% of mothers-initiated breastfeeding in one hour of delivery. While most mothers (82%) fed colostrum to infants, 27% provided pre-lacteal feeds. Illiterate mothers (56.3%), those with only primary education (70%) and unemployed mothers (53.85%) continued exclusive breastfeeding without introducing any complementary feeds after six months. The study concluded that breastfeeding can be enhanced through effective counselling provided by healthcare workers and by implementing educational programs specifically aimed at women with lower educational backgrounds and limited resources.[28]

In Telangana, cross-sectional study was conducted at Sri Krishna Children's Hospital. A convenience sampling technique was employed to collect the sample size, which included all postnatal mothers who delivered at the hospital (both vaginal and cesarean deliveries) during study period. The study carried over three months, including only women who gave birth at institute and had live infants at the time of data collection. Findings revealed 71% of mothers initiated breastfeeding early, while 29% had delayed initiation. The primary reason for the delayed initiation was that the baby was in the NICU post-delivery (50%), followed by inadequate breastfeeding practices

(25%). Notably, 84% attended regular antenatal follow-ups and 97% received breastfeeding counseling. Most health professionals who provide prenatal counseling are nurses. Their skills in managing lactation should also be enhanced through training.[29]

**Pre-Lacteal Feed**

In Uttarakhand, cross-sectional study was conducted with 950 postnatal mothers who attended the immunization clinic and pediatric outpatient department for vaccinations between April 2018 and November 2019. The mothers participated in face-to-face interviews utilizing structured questionnaires that assessed their knowledge, practices, and attitudes regarding newborn breastfeeding. The average knowledge score (11.72±1.78) indicated that the mothers had a good understanding of breastfeeding. Most mothers (81.45%) provided colostrum to their infants and 82% practiced exclusive breastfeeding. However, about 20% of participants reported giving additional feeds such as honey, coconut water, grape water, and lactogen. While breastfeeding practices were adequate, issues such as discarding colostrum, giving top feeds and starting weaning early were evident. Raising awareness among mothers and their families about appropriate newborn feeding practices is essential to foster a more positive attitude towards breastfeeding was the conclusion of the study.[30]

**Newborn care**

In Lucknow, a community-based cross-sectional study was conducted among 200 mothers of newborns (aged three to sixty days) born in coverage area of PHC Sarojini over eight months. A semi-structured questionnaire was utilized to conduct interviews with eligible mothers. The objective was to analyze postnatal newborn care practices and mothers' knowledge about newborn danger signs in Lucknow's rural

areas. The results revealed that 49.50% applied substances to the stump after birth. 52.5% applied Kajal to baby's eye. More than half of mothers breastfed their newborns within 1-4 hours of birth, with almost half (47%) practicing exclusive breastfeeding. Unsafe and dangerous traditional newborn care practices was more common in rural areas. The study concluded that health education and awareness activities should be implemented to improve maternal knowledge of many elements of newborn care.[31]

In Gujarat, a mixed methods study was conducted with 390 pregnant women using a two-stage sampling technique. Quantitative data were collected through a structured questionnaire, while qualitative insights came from in-depth interviews with 20 purposefully selected women. The majority of participants were young (56.5% aged 25 or younger), literate (85%), and from rural areas (82%). Findings showed that 59.5% of women were aware of cord care, and 77.2% knew when to initiate breastfeeding. Awareness of warning signs was relatively high, with 79.7% identifying fever and 70.5% recognizing jaundice; however, just 18% identified chest in-drawing. Factors linked to poor knowledge included multiparity, younger age, lower education levels, inadequate counseling, and normative delivery practices. Qualitative data indicated that reliance on informal sources and financial barriers hindered understanding of some danger signs. The study highlights the need for targeted interventions involving health workers and community support to improve awareness of neonatal danger signs among vulnerable women, facilitating timely healthcare access.[32]

In Nepal, a descriptive cross-sectional study examined the knowledge and practices of 50 postnatal mothers regarding newborn care. Using purposive sampling, data were collected via a Likert scale. The results indicated that 96% of mothers had adequate knowledge of newborn care while 4% (2/50) had inadequate knowledge.

All participants demonstrated good practices. Specifically, mothers demonstrated adequate knowledge and good practices concerning thermoregulation, eye care, feeding, recognizing danger signs and kangaroo mother care but showed poor awareness regarding umbilical cord care. A comparison of knowledge and practice revealed that practices generally exceeded knowledge levels in several areas.[33]

In Assam, a quantitative non-experimental approach utilizing a descriptive research design was adopted for this study, which was conducted for 50 postnatal mothers in maternity ward of VKNRL Hospital. The results indicated that majority of the participants, 54%, had moderate knowledge, while 26% exhibited poor knowledge, and 20% had adequate knowledge regarding newborn care. In terms of practices, 54% of postnatal mothers demonstrated moderate practices, 24% had adequate practices, and 22% showed poor practices related to newborn care. A significant association was found between knowledge of newborn care, educational status and mode of delivery among postnatal mothers. Additionally, significant association was observed between practices and the educational status of postnatal mothers. In conclusion, the participants exhibited moderate knowledge and practices regarding newborn care.[34]

**Immunization**

In Maharashtra, cross-sectional study was conducted in Primary Health Centre (PHC) of Government Medical College, Miraj. During the study period, all registered pregnant mothers at the center were identified and interviewed using a pre-designed and pre-tested questionnaire through house-to-house surveys. Their knowledge of vaccines was limited; they were primarily aware of polio, measles, rubella, and hepatitis vaccinations, with none having heard of mumps or influenza vaccines. The primary source of information regarding vaccinations was the Accredited Social Health Activist

(ASHA) at 62.1%, followed by Anganwadi Workers (AWW) at 15.8%. Most mothers expressed preference for vaccinating their children in government hospitals. Overall knowledge regarding the use of vaccines to prevent diseases was inadequate among the women. Notably, 96.8% believed that vaccinations do not have side effects, yet many were hesitant to vaccinate their children if they presented with conditions like colds or fever. While the attitude towards vaccination was viewed as satisfactory, the actual practice of immunization was poor, with only 62% of mothers with a first child adhering to the immunization schedule which highlights that pregnant women lack sufficient knowledge about immunization and suggests that antenatal period should be leveraged to emphasize the importance of complete immunization according to the recommended schedule.[35]

In Bhopal, a cross-sectional study was conducted in five selected urban slums to assess immunization coverage among children aged 0 to 24 months. A house-to-house survey was performed after obtaining oral consent from participants and collecting data on knowledge, attitudes and practices related to immunization. The study included 300 children, revealing that 154 (51.33%) were fully immunized, 67 (22.33%) partially immunized and 79 (26.33%) unimmunized. While 83.6% of mothers had a positive attitude towards vaccinations, around 15.6% mistakenly believed immunizations should be stopped if side effects arose. Additionally, 60% of mothers were ignorant of appropriate vaccination schedule. The main reasons for limited and non-immunization were a lack of information and poor healthcare infrastructure. These findings underscore the necessity for heightened awareness and motivation among parents to improve immunization rates in the urban slums of Bhopal, which currently lag behind national standards.[36]

A community-based cross-sectional study was conducted among 418 parents in North East Ethiopia, using stratified sampling technique with structured questionnaire. Results showed that 65.1% of parents possessed good knowledge about immunization, 57.3% had favorable attitude and 55.3% exhibited good immunization practices. Significant factors linked to parental knowledge included higher education levels (AOR=5.330), urban residency (AOR=2.788), a favorable attitude toward vaccination (AOR=4.308), and frequent receipt of immunization services. Mothers Were more susceptible to demonstrate favorable attitudes (AOR=3.813), and parents with good knowledge were also more likely to have positive attitudes (AOR=4.592). Good immunization practices were associated with higher educational attainment and knowledge, as well as shorter waiting times. Despite these findings, parental knowledge, attitudes and practices regarding infant immunization were lower compared to other studies. The study advocates for enhanced parental awareness through targeted health education and upgrade interventions to improve understanding of immunization and vaccine-preventable diseases.[37]

**Family Planning and Contraception**

In Odisha, a predesigned questionnaire was administered to 300 randomly selected postnatal women who were delivered at F.M. Medical College and Hospital in Balasore, over one year. The data collected included sociodemographic information, knowledge of different family planning methods, sources of information, utilization patterns, and reasons for non-utilization. Approximately 91% of the women were aware how to utilize family planning methods and about 82% recognized their importance. Furthermore, 75% reported having previously used birth spacing methods, with withdrawal (31%), oral contraceptive pills (OCP) (19%), and barrier methods (9%)

being the most commonly used. Awareness levels were high for OCPs (79%), sterilization (72%), barrier methods (71%), intrauterine contraceptive devices (53%), withdrawal methods (31%), and injectables (23%). The main sources of information were social circles (54%) and healthcare providers (35%). The top reasons for not utilizing family planning methods included the desire for more children (42%), fear of side effects (17%) and opposition from husbands and in-laws (16%). Despite the high levels of knowledge and awareness regarding contraception, the actual adoption of modern family planning methods remains unsatisfactory in this study, indicating a need for enhanced counselling and education to promote their usage.[38]

In Dehradun, a cross-sectional study used a self-developed questionnaire to interview 331 women in their immediate postpartum period after delivering a healthy live baby at Government Doon Medical College. Results showed that most participants (59.8%) had unplanned pregnancies. After conducting behavior change communication sessions focused on postpartum family planning, 89% of women accepted contraceptive methods. Main reasons for this acceptance were the desire for temporary child spacing (41%) and intention not to have more children (34%). Women who had above five pregnancies had higher odds of accepting contraception (adjusted odds ratio [AOR] = 1.951). However, several socioeconomic factors specific to low-income countries hinder the adoption and consistent use of postpartum contraception. To address this, customized behavior change communication and counseling might help clarify misconceptions and meet the varied family planning needs of new mothers.[39]

In Delhi, a cross-sectional study of 100 women was conducted to assess their contraception knowledge, attitude and practice at Maulana Azad Medical College. Participants in the study are from 18 to 45 years old and were attending a health facility.

Data was collected using a pretested questionnaire. The study found that women who participated were aware of at least one contraceptive method, and 11% never used contraception. Condoms were utmost frequently used contraceptive (55%), followed by Copper T (Cu T) (26%), pills (13%), injectables (6%), tubectomy (5%), and emergency contraception (3%). There was a 20% gap in contraception knowledge, attitude and practice. According to study, more educational programs and health camps are needed to raise awareness about existing contraceptive methods.[40]

# METHODOLOGY

## Topography

Karnataka is a state located in the southwestern region of India. It was originally known as "The State of Mysore" and was renamed "Karnataka" in 1973. It is India's 8th biggest state, with 5.8% of its total land area with 30 districts.


Belgaum or Belagavi, formerly known as "Venugrama" or "Bamboo Village," is a historic, culturally rich city located in the Western Ghats. Today, it is one of Karnataka's key districts, boasting a population of 4.78 million (2011 Census) and covering an area of 13,415 square kilometres, making it the largest in the state.[41]

It is bounded by Kolhapur District and Sangli District in Maharashtra - bordered to the west and north, to the northeast by Bijapur District, to the east by Bagalkot District, to the southeast by Gadag District, to the south by Dharwad and Uttara Kannada Districts and to the southwest by Goa. The district headquarters is the city of Belagavi, located in North Karnataka. Belagavi is also home to the second legislative building, where the Karnataka Legislature convenes annually. Belagavi is also called Kundanagari named after the famous sweet Kunda.[42]

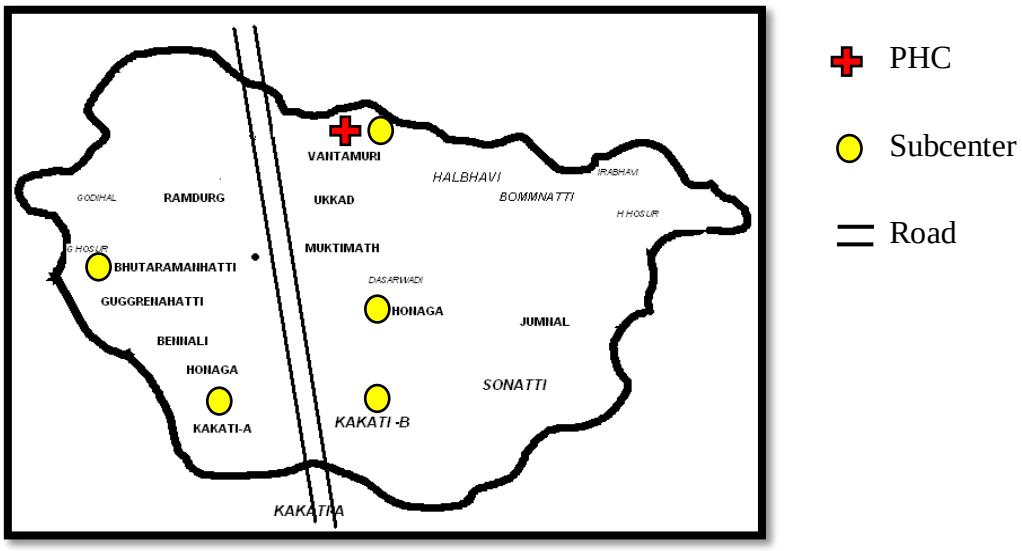



Fig: Map of Rural Primary Health Centre Vantamuri, Belagavi coverage area

**Study Design:** An Interventional Study

**Study Place:** The study was conducted in all five sub-centers of Rural Primary Health Centre, Vantamuri which is under field practice area of the Department of Community Medicine, Jawaharlal Nehru Medical College, KAHER, Belagavi.

Vantamuri, Bhutramnahatti, Honaga, Kakati A and Kakati B were the sub-centers chosen for the attainment of sample size under PHC, Vantamuri.

**Study Duration:** Study was conducted over one year, i.e., from 1st April 2023 to 31st March 2024.

**Sample Size:** Using G power under t-test for two independent groups, considering effect size as 0.35

Alpha = 0.05 Beta = 0.20 i.e., power of the test = 0.80

Allocation ratio N2/N1 = 1

The calculated sample size was 260

Taking attrition as 1.2, we get 260 x1.2= 312, i.e., 156 in the control group and 156 in the intervention group.

**Study Population:** Control Group (Postnatal Mothers) and Intervention Group (Antenatal Mothers)

**Sampling Technique:**

A list of antenatal and postnatal mothers attending regular visits to sub-centers of PHC Vantamuri was prepared by the Health Inspecting Officer. The participants were chosen using Systematic Random Sampling.

| Sub Centre | ANC / Month | PNC / Month |
|---|---|---|
| **Vantamuri** | 26 | 17 |
| **Bhutramnahatti** | 9 | 13 |
| **Honaga** | 12 | 9 |
| **Kakati A** | 12 | 10 |
| **Kakati B** | 12 | 11 |
| **Total** | 71 | 60 |

Sampling interval ~ 3

Every 3rd person will be a participant in study for both groups.

**Inclusion Criteria:**

- Control Group – Postnatal mother (Completed 42 days) residing under field practice area of PHC Vantamuri, Belagavi.
- Intervention Group - Pregnant women who completed 34 weeks of gestation residing under field practice area of PHC Vantamuri, Belagavi.

- After the delivery, participants should be in the respective study area for 42 days follow-up.

**Exclusion Criteria:**

- Mothers / Newborn having any complications after delivery
- Mothers who will be moving out of the catchment area after the delivery.

**Study Setting and Method of Data Collection**

- Ethical clearance was obtained from IEC of JNMC, Belagavi for research involving human subjects vide reference number MDC/JNMCIEC/49 dated 01.04.2023.
- The study was registered in the Clinical Trials Registry – India on May 15, 2023, with registration number CTRI/2023/05/052642.
- Written informed consent was acquired from all the study participants before the data collection.
- They were informed in detail about the study's objective their rights and possible benefits.
- Privacy and confidentiality among the participants involved were maintained throughout the conduction of the study.
- A pilot study was conducted with 10 % of the sample size.

**Questionnaire Validation:**

For the overall reliability, the questionnaire was internally validated using Cronbach's alpha. The cumulative value obtained was 0.794 ≈ 0.8. Thus, the questionnaire was feasible to conduct the study among target population.

**Data Collection Procedure:**

A predesigned, structured questionnaire was utilized to gather data on the participant's sociodemographic characteristics. The intervention group, consisting of women with gestational age ≥ 34 weeks received health education on postnatal care through PowerPoint presentations, handouts and videos (latching technique, newborn care and recognizing danger signs) as per WHO guidelines.[1] The intervention session was between 45 minutes to 1 hour delivered in PHC. After 42 days of postpartum knowledge, attitude and practice of the intervention and control group was assessed using a structured questionnaire during the immunization clinic.

The intervention group comprises participants from the subcenters of Vantamuri and Bhutramnahatti, while control group consists of Honaga, Kakati A, and Kakati B. Since the intervention group area is distinct from the control group area, this geographical distance reduces the possibility of dilution. Participants from distinct clusters are less likely to share intervention-related experiences, information, or behaviors. Thereby reducing the intervention dilution among the participants.

The survey questionnaire was split into six sections - demographic and personal data, obstetrics history, Knowledge (K), Attitude (A) and Practices (P) regarding postnatal visits and postnatal danger signs, breastfeeding, newborn care and immunization, personal hygiene and nutrition, and family planning measures. Multiple-choice questions were utilized to assess questionnaire replies.

**Data Processing and Statistical Analysis:**

The information collected was entered in Microsoft Excel and a Master Chart was created. Coding was used to encrypt the data for each option on the questionnaire. The data was analyzed with SPSS software (Trial Version 23).Categorical variables were represented as percentages and frequencies. Unpaired t-test was employed to compare the Knowledge (K) scores, while the Mann-Whitney U test was used to compare the Attitude (A) and Practices (P) between the intervention and control groups, as the data in the intervention group did not meet the assumption of normality. Normality was assessed using Kolmogorov-Smirnov test. All the statistical analysis was carried out using SPSS software. A p-value of less than 0.05 was considered statistically significant.

**Definition of Study Variables:**

To determine the meanings of the concepts under research, the study used standardized definitions whenever possible.

**Proforma Variables:**

| | |
|---|---|
| **Age** | Participant's age in completed years as of her last birthday |
| **Religion** | Religion was grouped into 5 categories which are most prevalent in the region Hindu, Christian, Muslim, Jain, and Sikh. |
| **Education** | The educational status of the subjects was categorized as<br>• Illiterate: Those who cannot read or write even in one language or who have not even undergone pre-schooling<br>• Primary Education: Completed class I to IV<br>• Secondary Education: Completed class V to VII<br>• High School Education: Completed class VIII to X<br>• P.U.C: Completed Pre-University course<br>• Graduate: Completion of a degree course<br>• Postgraduate /PhD: Completion of post-graduation or PhD |
| **Occupation** | • Unemployed: Who doesn't have any employment<br>• Unskilled: Who does operations that involve the performance of simple duties and task<br>• Semi-skilled: One who does work generally of a generally specified routine nature.<br>• Skilled: One capable of working efficiently and exercising considerable independence and judgment can be made. |
| **Type of Family[3]** | • **Nuclear:** Consists of married couple along with their dependent children<br>• **Joint family:** Consists of number of married couples and their children who live in the same household.<br>• **Three-generation family:** It refers to a household where the representatives from three different generations live together in the same house. |
| **Total Family Income** | It is the combined income of all earning members of the family. |

<table>
<tr><td>Family size</td><td>It refers to total number of members in the family.</td></tr>
<tr><td>Per Capita Income</td><td>It is the average income earned per person in a given family.</td></tr>
<tr><td>Socio Economic Status</td><td>
<ul>
<li>The B. G. Prasad Scale, introduced in 1961, is based on the monthly per capita income of a family and offers a simple approach to determining socioeconomic status and user-friendly tool for determining a person's or family's socioeconomic status (SES).</li>
<li>B. G. Prasad's categorization is based on the Consumer Price Index - Industrial Worker (CPI-IW), which tracks price variations for a particular set of goods and services.</li>
</ul>
<u>Updated B. G. Prasad Scale using CPI-IW January 2024</u><u>[43]</u>
<table>
<tr><th>Social – Economic Class</th><th>Revised B. G. Prasad’s classification for January 2024 (Rs. per month)</th></tr>
<tr><td>Class I</td><td>≥9130</td></tr>
<tr><td>Class II</td><td>4565 to 9129</td></tr>
<tr><td>Class III</td><td>2739 to 4564</td></tr>
<tr><td>Class IV</td><td>1369 to 2738</td></tr>
<tr><td>Class V</td><td><1369</td></tr>
</table>
</td></tr>
<tr><td>Age at Menarche</td><td>Age at which a female experienced her first menstrual period.</td></tr>
<tr><td>Regularity of Menstrual Cycle</td><td>
<ul>
<li>Regular: Cycles range from 21 to 35 days</li>
<li>Irregular: Cycles less than 21 days or more than 35 days</li>
</ul>
</td></tr>
<tr><td>Duration of Bleeding during menses</td><td>Refers to the length of time a woman experiences menstrual bleeding during her menstrual cycle.</td></tr>
</table>

| | |
|---|---|
| **Frequency of Menstrual Cycle** | Refers to how often a woman experiences menstruation which is measured from first day of one period to first day of the next period |
| **Age At Marriage** | Refers to age at which individuals legally and/or socially enter into a marital union |
| **Obstetric Score[44]** | • **Para:** Number of pregnancies a woman has carried to a viable gestational age that resulted in births<br>• denotes a state of previous pregnancy beyond the period of viability.<br>• **Live:** The delivery of a baby that shows signs of life at the time of birth. This includes any signs of breathing, heartbeat, or voluntary muscle movements<br>• **Abortion:** refers to termination of a pregnancy before the fetus can live independently outside the womb<br>• **MTP:** It is a medical procedure that involves the intentional termination of a pregnancy using medication rather than surgical methods<br>• **Still Birth:** A stillbirth is defined as delivery of a fetus that has died at or after gestational age of 20 weeks |
| **Type of Delivery [44]** | • **Spontaneous Vaginal Delivery:** Process of giving birth to a baby through the vagina without using medical intervention like cesarean section (C-section) or the use of forceps or vacuum assistance for delivery<br>• **Assisted Vaginal Delivery:** Refers to delivery of a baby through the vagina with help of medical instruments (Vacuum extraction, forceps delivery)<br>• **Elective Cesarean Section**: A planned surgical procedure to deliver baby through an incision in the mother's abdomen and uterus, rather than through the vaginal canal<br>• **Emergency Cesarean Section:** A surgical procedure performed to deliver baby when there is urgent need to do so for the safety of mother or the baby typically done when there are complications during labor or delivery that pose a significant risk to the baby or mother.[44] |

| | |
|---|---|
| **Anemia**[44] | During pregnancy, a hemoglobin concentration less than 11.0 g/dL in the 1st trimester and less than 10.5 or 11.0 g/dL in the 2nd or 3rd trimester. |
| **Gestational Diabetes Mellitus**[44] | Increase in blood glucose (Fasting $\geq$ 92, 1hr $\geq$ 180, 2hr $\geq$ 153) during pregnancy in women who don't have diabetes before pregnancy. |
| **Pregnancy Induced Hypertension**[44] | A condition characterized by high blood pressure (BP >140/90 mm of hg) that develops after the 20th week of gestation in women not having hypertension before pregnancy. |

# RESULTS

| Table 1. Distribution of participants according to age (n=312) | | | | |
|---|---|---|---|---|
| **Age (in years)** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| < 20 years | 40 | 25.6 | 42 | 26.9 |
| 21 – 25 years | 58 | 37.2 | 78 | 50.0 |
| 26 – 30 years | 35 | 22.4 | 28 | 17.9 |
| > 30 years | 23 | 14.7 | 8 | 5.1 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

Majority of participants in both groups fall within the 21-25 age range, with 50.0% of the intervention group and 37.2% of the control group represented in this category. On the other hand, age group over 30 years makes up the smallest proportion in both groups, with the control group having a higher representation at 14.7%, while only 5.1% of the intervention group falls within this age bracket.

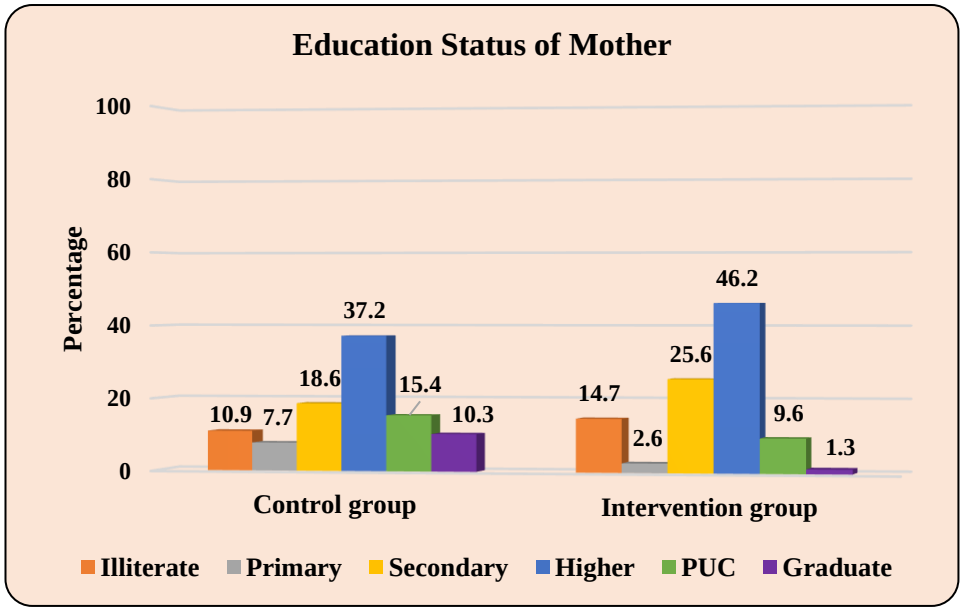
| Table 2. Distribution of participants according to religion (n=312) | | | | |
|---|---|---|---|---|
| **Religion** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| Hindu | 131 | 84.0 | 143 | 91.7 |
| Muslim | 25 | 16.0 | 13 | 8.3 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

The intervention group had higher percentage of Hindu participants, with 91.7%, compared to 84.0% in the control group. Conversely, the control group has a larger proportion of Muslim participants, at 16.0%, while only 8.3% of the intervention group.

| Table 3. Distribution of participants according to education status of mother (n=312) | | | | |
|---|---|---|---|---|
| **Education** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| Illiterate | 17 | 10.9 | 23 | 14.7 |
| Primary | 12 | 7.7 | 4 | 2.6 |
| Secondary | 29 | 18.6 | 40 | 25.6 |
| Higher | 58 | 37.2 | 72 | 46.2 |
| PUC | 24 | 15.4 | 15 | 9.6 |
| Graduate | 16 | 10.3 | 2 | 1.3 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

In the intervention group, 46.2% of mothers have completed higher education vs 37.2% of mothers in the control group. However, the control group has a larger percentage of mothers with graduate degrees (10.3% vs. 1.3%) and primary education (7.7% vs. 2.6%) compared to the intervention group.

**Fig.1. Distribution of participants according to education status of mother (n=312)**



| **Table 4. Distribution of participants according to occupation of the mother (n=312)** | | | | |
|---|---|---|---|---|
| **Occupation** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| Unemployed | 118 | 75.6 | 132 | 84.6 |
| Unskilled worker | 22 | 14.1 | 16 | 10.3 |
| Semi-skilled worker | 12 | 7.7 | 7 | 4.5 |
| Skilled worker | 4 | 2.6 | 1 | 0.6 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

Majority of mothers in both groups are unemployed, with 75.6% in the control group and 84.6% in the intervention group. The distribution of unskilled, semi-skilled and skilled workers is similar between the two groups.

| **Table 5. Distribution of participants according to education status of father (n=312)** | | | | |
|---|---|---|---|---|
| **Education** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| Illiterate | 25 | 16.0 | 33 | 21.2 |
| Primary | 10 | 6.4 | 3 | 1.9 |
| Secondary | 29 | 18.6 | 30 | 19.2 |
| Higher | 38 | 24.4 | 68 | 43.6 |
| PUC | 31 | 19.9 | 16 | 10.3 |
| Graduate | 23 | 14.7 | 6 | 3.8 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

In the control group, 16% of fathers are illiterate and 24.4% have higher education, while in the intervention group, 21.2% are illiterate and 43.6% have higher education.

| Table 6. Distribution of participants according to occupation of the father (n=312) | | | | |
|---|---|---|---|---|
| **Occupation** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| Unemployed | 3 | 1.9 | 8 | 5.2 |
| Unskilled worker | 31 | 19.9 | 24 | 15.4 |
| Semi-skilled worker | 104 | 66.7 | 106 | 67.9 |
| Skilled worker | 18 | 11.5 | 18 | 11.5 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

In both control and intervention groups, the majority of fathers are semi-skilled workers (66.7% in the control group vs 67.9% in intervention group). The intervention group has a slightly higher percentage of unemployed fathers (5.2%) compared to control group (1.9%). Other occupational categories are fairly consistent between groups.

| Table 7. Distribution of participants according to type of family (n=312) | | | | |
|---|---|---|---|---|
| **Type of family** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| Nuclear | 39 | 25.0 | 41 | 26.3 |
| Joint | 117 | 75.0 | 115 | 73.7 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

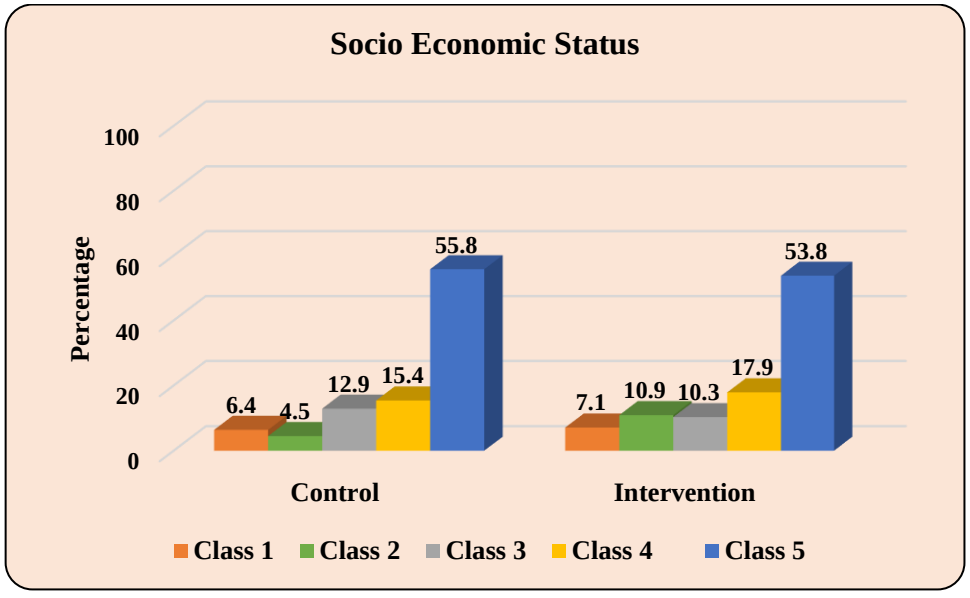
Both groups have a significant proportion of participants from joint families, with 75.0% in the control group and 73.7% in the intervention group. The percentage of participants from nuclear families is similar in both groups, with 25.0% in the control group and 26.3% in the intervention group.

**Table 8. Distribution of participants according to socio-economic status (n=312) (as per Modified B.G Prasad Classification)**

| Socio Economic Status | Control Group (n=156) | | Intervention Group (n=156) | |
|---|---|---|---|---|
| | Frequency | Percentage | Frequency | Percentage |
| Class I | 10 | 6.4 | 11 | 7.1 |
| Class II | 7 | 4.5 | 17 | 10.9 |
| Class III | 28 | 17.9 | 16 | 10.3 |
| Class IV | 24 | 15.4 | 28 | 17.9 |
| Class V | 87 | 55.8 | 84 | 53.8 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

Most participants in both groups are from SES Class V (Lower Class), with 55.8% in the control group and 53.8% in intervention group. The distribution of participants across the other classes (Class I to Class IV) is similarly distributed in both groups.

**Fig.2. Distribution of participants according to socio-economic status (n=312)**



| Table 9. Distribution of participants according to BPL card (n=312) | | | | |
|---|---|---|---|---|
| **Having BPL Card** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| Yes | 55 | 35.3 | 60 | 38.5 |
| No | 101 | 64.7 | 96 | 61.5 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

Both groups have similar proportions with BPL cards, 35.3% in the control and 38.5% in intervention group.

| Table 10. Distribution of participants according to age at menarche (n=312) | | | | |
|---|---|---|---|---|
| **Age (in years)** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| < 10 years | 7 | 4.5 | 7 | 4.5 |
| 10 – 12 years | 39 | 25.0 | 44 | 28.2 |
| 13 – 14 years | 99 | 63.5 | 93 | 59.6 |
| > 14 years | 11 | 7.1 | 12 | 7.7 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

Both groups have similar age distributions of menarche, with the majority of participants reporting it between 13 and 14 years. The proportions across other age ranges are also comparable between the two groups.

**Fig.3. Distribution of participants according to age at menarche (n=312)**

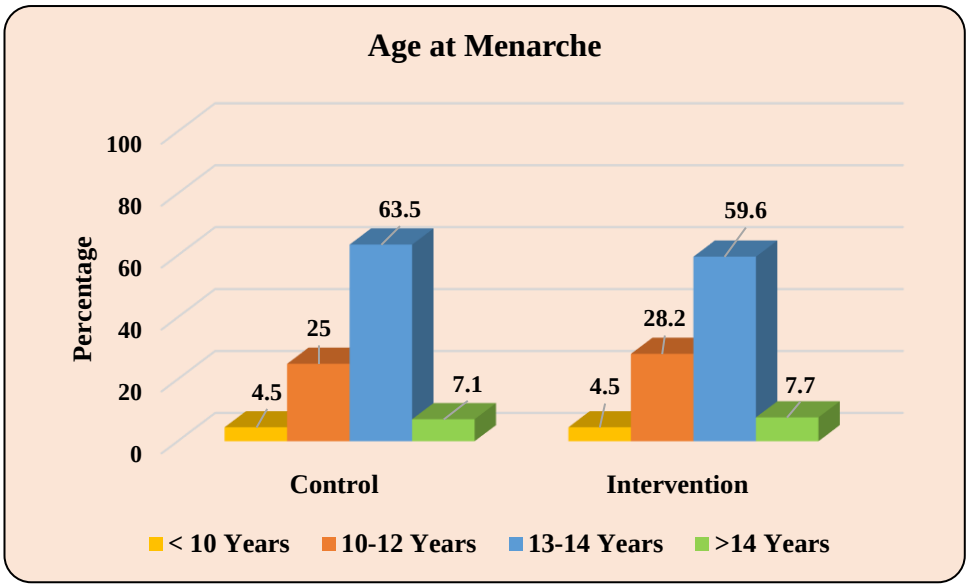



**Table 11. Distribution of participants according to regularity of menstrual cycle (n=312)**

| Menstrual Cycle | Control Group (n=156) | | Intervention Group (n=156) | |
|---|---|---|---|---|
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| Regular | 105 | 67.3 | 116 | 74.4 |
| Irregular | 51 | 32.7 | 40 | 25.6 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

A greater percentage of participants in the intervention group reported having regular menstrual cycles, at 74.4% compared to 67.3% in the control group.

| Table 12. Distribution of participants according to type of delivery (n=312) | | | | |
|---|---|---|---|---|
| **Type of delivery** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| Spontaneous Vaginal | 96 | 61.5 | 141 | 90.4 |
| Assisted Vaginal | 0 | 0 | 1 | 0.6 |
| Emergency C section | 21 | 13.5 | 7 | 4.5 |
| Elective C section | 39 | 25.0 | 7 | 4.5 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

In the control group, 61.5% had spontaneous vaginal deliveries, 13.5% emergency cesarean and 25% elective cesarean. In contrast, the intervention group had 90.4% spontaneous vaginal deliveries with lower cesarean rates.

| Table 13. Distribution of participants according to Co-morbidity during pregnancy (n=312) | | | | |
|---|---|---|---|---|
| **Comorbidities** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| None | 130 | 83.3 | 69 | 44.2 |
| Anemia | 11 | 7.1 | 74 | 47.4 |
| Gestational Diabetes Mellitus (GDM) | 10 | 6.4 | 10 | 6.4 |
| Pregnancy-induced hypertension (PIH) | 5 | 3.2 | 0 | 0 |
| GDM + PIH | 0 | 0 | 3 | 1.9 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

While 83.3% of the control group reported no comorbidities, the intervention group had a high prevalence of anemia at 47.4%. Other comorbidities like gestational diabetes and hypertension were relatively low in both groups.

| Table 14. Distribution of participants according to knowledge regarding ideal postnatal visit (n=312) | | | | |
|---|---|---|---|---|
| **No. of visit** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| 4 visits | 3 | 1.9 | 56 | 35.9 |
| 3 visits | 8 | 5.1 | 80 | 51.3 |
| 2 visits | 2 | 1.3 | 14 | 9.0 |
| 1 visit | 2 | 1.3 | 5 | 3.2 |
| Don't Know | 141 | 90.4 | 1 | 0.6 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

Most of the participants in the control group (90.4%) were unaware of the recommended number of postnatal visits. In contrast, the intervention group showed better awareness, with 35.9% correctly identifying 4 visits as ideal and 51.3% selecting 3 visits.

| Table 15. Distribution of participants according to knowledge regarding Postnatal Care (PNC) practices (n=312) | | | | |
|---|---|---|---|---|
| **Heard of PNC Practices** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| Yes | 13 | 8.3 | 155 | 99.4 |
| No | 143 | 91.7 | 1 | 0.6 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

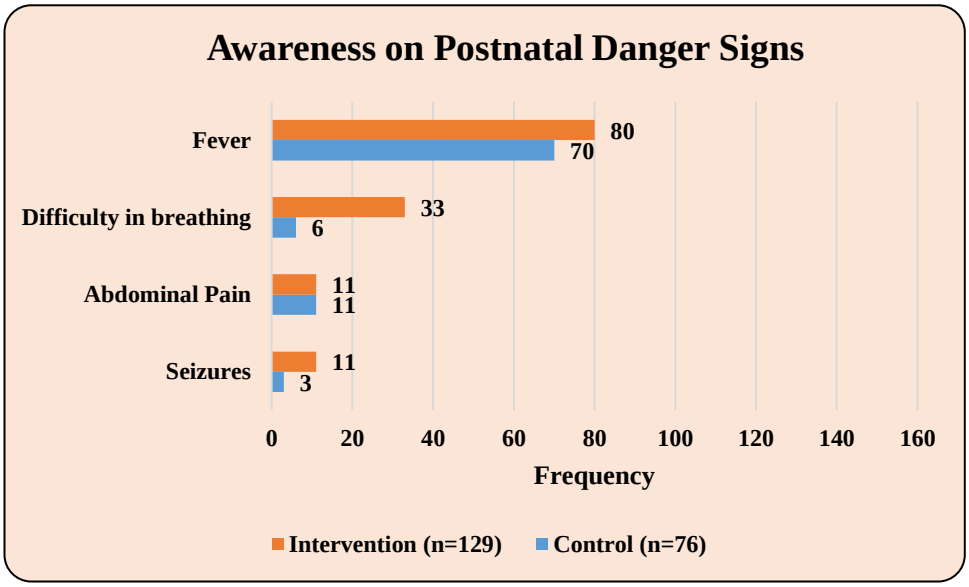
In control group, 91.7% were unaware, while 99.4% of the intervention group were aware. This substantial difference demonstrates the intervention's effectiveness in enhancing awareness of PNC practices.

**Table 16. Distribution of participants according to knowledge regarding postnatal danger signs (n=312)**

| Are you aware of postnatal danger signs | Control Group (n=156) | | Intervention Group (n=156) | |
|---|---|---|---|---|
| | Frequency | Percentage | Frequency | Percentage |
| Yes | 76 | 48.7 | 129 | 82.4 |
| No | 80 | 51.3 | 27 | 17.6 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

Control group, 51.3% were unaware of postnatal danger signs, while 48.7% were aware. In contrast, in the intervention group 82.4% were aware of the danger signs and indicates a higher difference between the two groups, with the intervention group demonstrating complete awareness.

**Fig.4. Distribution of participants according to awareness regarding specific postnatal danger signs**




The intervention group demonstrated a greater understanding of postnatal danger signs such as fever, difficulty in breathing, abdominal pain and seizures when compared to control group.

| Table 17. Distribution of participants according to knowledge regarding giving colostrum to newborns (n=312) | | | | |
|---|---|---|---|---|
| **Is colostrum essential for newborns** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| Yes | 112 | 71.8 | 145 | 92.9 |
| No | 44 | 28.2 | 11 | 7.1 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

Control group, 71.8% recognized colostrum as essential, whereas 92.9% of participants in intervention group acknowledged its importance.

| Table 18. Distribution of participants according to knowledge regarding giving pre-lacteal feed for newborns (n=312) | | | | |
|---|---|---|---|---|
| **Is pre-lacteal feed good for newborns** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| Yes | 17 | 10.9 | 6 | 3.8 |
| No | 139 | 89.1 | 150 | 96.2 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

10.9% believed that pre-lacteal feeding is good for newborns among control group, while only 3.8% of participants in intervention group shared this view.

| Table 19. Distribution of participants according to knowledge regarding breastfeeding initiation (n=312) | | | | |
|---|---|---|---|---|
| **When you must initiate breastfeeding after delivery** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| <1 hr | 96 | 61.5 | 139 | 89.1 |
| 1 hr - 2 hr | 53 | 34.0 | 17 | 10.9 |
| >2 hr | 7 | 4.5 | 0 | 0 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

The intervention group demonstrated better knowledge about breastfeeding initiation, with 89.1% choosing to breastfeed within the first hour after delivery, compared to 61.5% in control group.

| Table 20. Distribution of participants according to knowledge regarding Exclusive Breastfeeding (EBF) (n=312) | | | | |
|---|---|---|---|---|
| **Have you heard about EBF** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| Yes | 63 | 40.4 | 144 | 92.3 |
| No | 93 | 59.6 | 12 | 7.7 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

Control group, 40.4% were aware of exclusive breastfeeding, while 92.3% in intervention group reported awareness which indicates a difference in awareness levels between the groups.

| Table 21. Distribution of participants according to knowledge regarding when to start supplementary feeding (n=312) | | | | |
|---|---|---|---|---|
| **When to start supplementary feeding** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| > 3 months | 94 | 60.2 | 64 | 41.0 |
| > 6 months | 60 | 38.5 | 89 | 57.1 |
| >1 year | 2 | 1.3 | 3 | 1.9 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

Control group, 60.2% chose >3 months, 38.5% selected >6 months, and 1.3% chose >1 year. Meanwhile intervention group, 41.0% opted for >3 months, 57.1% for >6 months and 1.9% for >1 year.

**Fig.5. Distribution of participants according to knowledge regarding when to start supplementary feeding (n=312)**

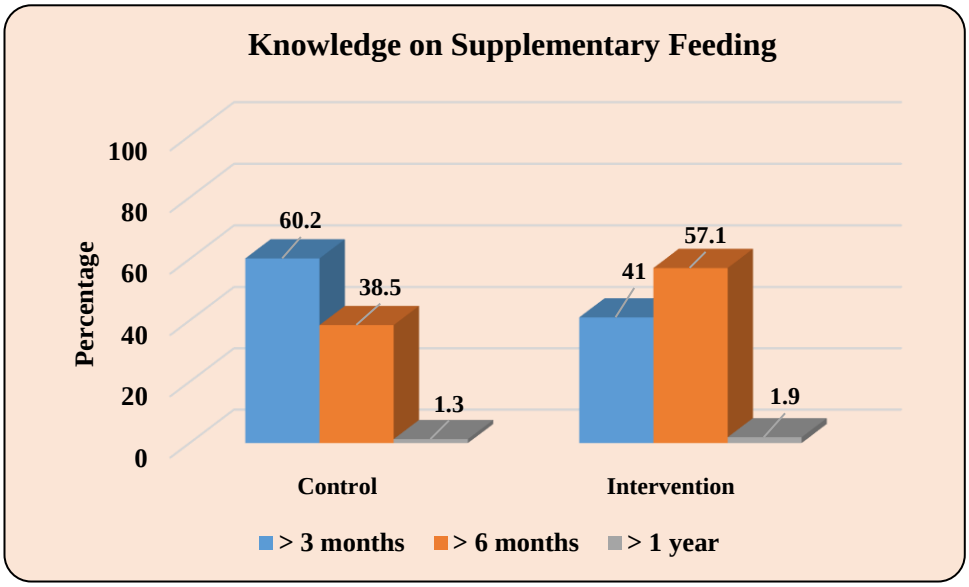


**Table 22. Distribution of participants according to knowledge regarding breastfeeding in control group and intervention group (n=312)**

| Sl. no | Knowledge regarding breastfeeding | | Control group (n=156) | | Intervention Group (n=156) | |
|---|---|---|---|---|---|---|
| | | | Frequency | Percentage | Frequency | Percentage |
| a. | During sick can you give breast milk | Yes | 64 | 41.0 | 150 | 96.2 |
| | | No | 84 | 53.8 | 5 | 3.2 |
| | | No idea | 8 | 5.1 | 1 | 0.6 |
| b. | Should breastfeeding be given on demand | Yes | 70 | 44.9 | 131 | 84.0 |
| | | No | 48 | 30.8 | 22 | 14.1 |
| | | No idea | 38 | 24.4 | 3 | 1.9 |
| c. | Can burping be done after each feed | Yes | 88 | 56.4 | 116 | 74.4 |
| | | No | 43 | 27.6 | 38 | 24.4 |
| | | No idea | 25 | 16.0 | 2 | 1.3 |
| d. | Water can be given to the baby during EBF | Yes | 53 | 34.0 | 113 | 72.4 |
| | | No | 94 | 60.3 | 42 | 26.9 |
| | | No idea | 9 | 5.8 | 1 | 0.6 |
| e. | Breast milk alone sufficient for a baby till 6 months | Yes | 45 | 28.8 | 101 | 64.7 |
| | | No | 91 | 58.3 | 53 | 34.0 |
| | | No idea | 20 | 12.8 | 2 | 1.3 |
| f. | Breastfeeding can prevent diseases affecting the breast | Yes | 33 | 21.2 | 103 | 66.0 |
| | | No | 99 | 63.5 | 51 | 32.7 |
| | | No idea | 24 | 15.4 | 2 | 1.3 |

| | | | | | | |
|---|---|---|---|---|---|---|
| g. | Breast milk helps in bonding between mother and the child | Yes | 43 | 27.6 | 122 | 78.2 |
| | | No | 86 | 55.1 | 33 | 21.2 |
| | | No idea | 27 | 17.3 | 1 | 0.6 |
| h. | Breast engorgement leads to poor attachment during lactation | Yes | 85 | 54.5 | 151 | 96.8 |
| | | No | 65 | 41.7 | 5 | 3.2 |
| | | No idea | 6 | 3.8 | 0 | 0 |

Intervention group showed higher knowledge regarding breastfeeding compared to control group across all aspects. 96.2% of the intervention group knew that breast milk can be given during illness, compared to 41.0% in the control group. Intervention group also demonstrated greater awareness on breastfeeding on demand (84.0%), burping after feedings (74.4%), and the sufficiency of breast milk until 6 months (64.7%). Additionally, more participants in intervention group recognized the importance of breastfeeding in disease prevention (66.0%) and bonding (78.2%) and understood breast engorgement's effect on attachment (96.8%).

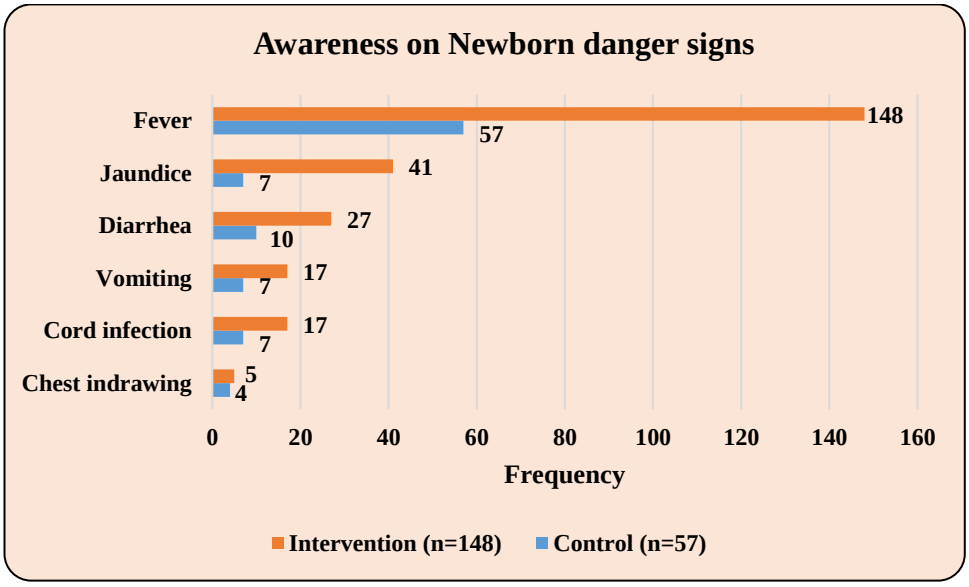
**Table 23. Distribution of participants according to knowledge regarding newborn care and immunization in the control group and intervention group (n=312)**

| Sl. no | Knowledge regarding newborn care and immunization | | Control group (n=156) | | Intervention Group (n=156) | |
|---|---|---|---|---|---|---|
| | | | Frequency | Percentage | Frequency | Percentage |
| a. | Have you heard of newborn care | Yes | 52 | 33.3 | 151 | 96.8 |
| | | No | 104 | 66.7 | 5 | 3.2 |
| b. | Keeping the baby attached to the mother is good | Yes | 92 | 59.0 | 143 | 91.7 |
| | | No | 64 | 41.0 | 13 | 8.3 |
| c. | Keeping the room warm is good | Yes | 60 | 38.5 | 105 | 67.3 |
| | | No | 96 | 61.5 | 51 | 32.7 |
| d. | Do you know delay in bathing the baby is good | Yes | 39 | 25.0 | 118 | 75.6 |
| | | No | 117 | 75.0 | 38 | 24.4 |
| e. | Keeping the baby skin-to-skin contact helps in maintaining temperature | Yes | 40 | 25.6 | 125 | 80.1 |
| | | No | 116 | 74.4 | 31 | 19.9 |
| f. | Are you aware of vaccines that are to be given immediately after the birth of the newborn | Yes | 57 | 36.5 | 149 | 95.5 |
| | | No | 99 | 63.5 | 7 | 4.5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| g. | Do you know the danger signs of newborns | Yes | 57 | 36.5 | 148 | 94.9 |
| | | No | 99 | 63.5 | 8 | 5.1 |
| h. | Vaccination beneficial for preventing disease in infants | Yes | 89 | 57.1 | 152 | 97.4 |
| | | No | 67 | 42.9 | 4 | 2.6 |
| i. | Do you know birth registration for the baby in the local panchayat is mandatory | Yes | 97 | 62.2 | 147 | 94.2 |
| | | No | 59 | 37.8 | 9 | 5.8 |

Intervention group showed higher knowledge about newborn care and immunization compared to control group across all aspects. 96.8% of the intervention group had heard of newborn care, compared to just 33.3% in control group. Majority of the intervention group (91.7%) understood that keeping the baby attached to the mother was beneficial, whereas only 59.0% of the control group knew this. The intervention group also exhibited greater awareness regarding keeping the room warm (67.3% vs. 38.5%), delaying bathing (75.6% vs. 25.0%), and the benefits of skin-to-skin contact (80.1% vs. 25.6%). Knowledge about newborn vaccinations was notably higher in the intervention group, with 95.5% being aware of the vaccines given immediately after birth, compared to 36.5% in the control group. Additionally, 97.4% of the intervention group knew the benefits of vaccination, compared to 57.1% in the control group.

**Fig.6. Distribution of participants according to awareness regarding specific newborn danger signs.**




The intervention group showed a better awareness of newborn danger signs regarding fever, jaundice, diarrhea, vomiting, cord infection, and chest indrawing compared to control group.

**Table 24. Distribution of participants according to knowledge regarding personal hygiene and nutrition in the control group and intervention group (n=312)**

| Sl. no | Knowledge regarding personal hygiene and nutrition | | Control group (n=156) | | Intervention Group (n=156) | |
|---|---|---|---|---|---|---|
| | | | Frequency | Percentage | Frequency | Percentage |
| a. | Washing hands before and after handling the baby is necessary | Yes | 91 | 58.3 | 137 | 87.8 |
| | | No | 65 | 41.7 | 19 | 12.2 |
| b. | Heard of postnatal exercise and postnatal yoga | Yes | 16 | 10.3 | 58 | 37.2 |
| | | No | 140 | 89.7 | 98 | 62.8 |

| | | | | | | |
|---|---|---|---|---|---|---|
| c. | Iron supplementation is to be taken during the postnatal period | Yes | 49 | 31.4 | 134 | 85.9 |
| | | No | 107 | 68.6 | 22 | 14.1 |
| d. | Do you know washing the perineum daily helps to decrease infection | Yes | 36 | 23.1 | 135 | 86.5 |
| | | No | 120 | 76.9 | 21 | 13.5 |
| e. | Do you know that increase in food and fluid intake is good | Yes | 46 | 29.5 | 145 | 92.9 |
| | | No | 110 | 70.5 | 11 | 7.1 |
| f. | Do you know adequate rest and avoiding lifting weights is good for postpartum mother | Yes | 74 | 47.4 | 154 | 98.7 |
| | | No | 82 | 52.6 | 2 | 1.3 |

The group that received the intervention demonstrated greater knowledge about personal hygiene and nutrition compared to the control group. Around 87.8% of the intervention group recognized the importance of washing hands before and after handling the baby whereas 58.3% of the control group did. Awareness of postnatal exercises and yoga was also higher in the intervention group (37.2%) compared to control group (10.3%). The intervention group showed much greater knowledge about iron supplementation during the postnatal period (85.9% vs. 31.4%), perineal hygiene

(86.5% vs. 23.1%), and the benefits of increased food and fluid intake (92.9% vs. 29.5%). Additionally, 98.7% of participants in intervention group understood the importance of adequate rest and avoiding heavy lifting postpartum, whereas only 47.4% of the control group shared this understanding.

**Table 25. Distribution of participants according to knowledge regarding the duration of iron supplementation (n=312)**

| How many months of iron supplementation to be taken | Control Group (n=156) | | Intervention Group (n=156) | |
|---|---|---|---|---|
| | Frequency | Percentage | Frequency | Percentage |
| Not answered | 107 | 68.6 | 22 | 14.2 |
| 3 months | 22 | 14.1 | 9 | 5.7 |
| 4 months | 24 | 15.4 | 65 | 41.7 |
| 6 months | 3 | 1.9 | 60 | 38.4 |
| 1 year | 0 | 0 | 0 | 0 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

68.6% of the control group did not provide a response, while 14.1% indicated 3 months and 15.4% indicated 4 months. In intervention group, 41.7% stated 6 months, and 38.4% stated 1 year.

| Table 26. Distribution of participants according to knowledge regarding contraceptive methods (n=312) | | | | |
|---|---|---|---|---|
| **Contraceptive method you know** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| Pills | 8 | 5.1 | 103 | 66.0 |
| Intrauterine Devices | 4 | 2.6 | 5 | 3.2 |
| Female Sterilization | 5 | 3.2 | 13 | 8.3 |
| Condom | 3 | 1.9 | 8 | 5.1 |
| Don't know | 136 | 87.2 | 27 | 17.3 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

Control group, most participants (87.2%) lack knowledge, while the intervention group shows much higher awareness, with 66.0% knowing about pills, 8.3% about female sterilization, and 5.1% about condoms.

| Table 27. Distribution of participants according to knowledge regarding effective contraception after pregnancy (n=312) | | | | |
|---|---|---|---|---|
| **Effective contraception after pregnancy you know** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| Breastfeeding | 7 | 4.5 | 128 | 82.1 |
| Pills | 11 | 7.1 | 15 | 9.6 |
| Copper T Implantation | 1 | 0.6 | 3 | 1.9 |
| Don't know | 137 | 87.8 | 10 | 6.4 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

Control group 87.8% were unaware of effective contraceptive methods, while in intervention group 82.1% recognized breastfeeding as a feasible option with only 9.6% referring to pills.

| Table 28. Distribution of participants according to knowledge regarding the ideal time for birth spacing (n=312) | | | | |
|---|---|---|---|---|
| **Ideal time for birth spacing** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| 2 years | 6 | 3.8 | 119 | 76.3 |
| 3 years | 4 | 2.6 | 22 | 14.1 |
| 4 years | 9 | 5.8 | 11 | 7.1 |
| 5 years | 11 | 7.1 | 0 | 0 |
| Don't know | 126 | 80.8 | 4 | 2.5 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

80.8% of the control group were unaware of ideal birth spacing, and 76.3% of the intervention group identified two years as ideal, with smaller percentages suggesting three or four years, highlighting the intervention's effectiveness.

| Table 29. Distribution of participants according to knowledge regarding family planning measures in the control group and intervention group (n=312) | | | | | | |
|---|---|---|---|---|---|---|
| **Sl. no** | **Knowledge regarding family planning measures** | | **Control group (n=156)** | | **Intervention Group (n=156)** | |
| | | | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| a. | Whether you can use OCP after delivery | Yes | 4 | 2.6 | 67 | 42.9 |
| | | No | 5 | 3.2 | 51 | 32.7 |
| | | Don't know | 147 | 94.2 | 38 | 24.4 |
| b. | Are pills supplied in Govern-ment Hospital PHCs | Yes | 5 | 3.2 | 96 | 61.5 |
| | | No | 7 | 4.5 | 30 | 19.2 |
| | | Don't know | 144 | 92.3 | 30 | 19.2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| c. | Do you know when pills can be consumed during the post-partum period | Yes | 1 | 0.6 | 137 | 87.8 |
| | | No | 7 | 4.5 | 14 | 9.0 |
| | | Don’t know | 148 | 94.8 | 5 | 3.2 |

Around 42.9% of the intervention group knew that oral contraceptive pills (OCP) could be used after delivery, compared to control group 2.6%. Additionally, knowledge about the availability of pills at government hospitals was far greater in intervention group, with 61.5% aware of their availability, compared to only 3.2% in control group. The intervention group also showed an increase in awareness about when postpartum pills can be consumed, with 87.8% understanding this, compared to only 0.6% in control group. Furthermore, the control group had a large proportion of participants who were unsure or lacked knowledge about these topics. These results underscore the positive impact of the intervention in improving participants' knowledge of family planning measures.

**Table 30. Distribution of participants according to attitude regarding postnatal visit and postnatal danger signs in the control group and intervention group (n=312)**

| Sl. no | Attitude regarding postnatal visits and postnatal danger signs | | Control group (n=156) | | Intervention Group (n=156) | |
|---|---|---|---|---|---|---|
| | | | Frequency | Percentage | Frequency | Percentage |
| a. | Do you think four visits are required during the postpartum period | Yes | 4 | 2.6 | 147 | 94.2 |
| | | No | 86 | 55.1 | 9 | 5.8 |
| | | No Idea | 66 | 42.3 | 0 | 0 |
| b. | Do you think knowing postnatal danger signs can reduce mortality | Yes | 3 | 1.9 | 93 | 59.6 |
| | | No | 89 | 57.1 | 61 | 39.1 |
| | | No idea | 64 | 41.0 | 2 | 1.3 |
| c. | Do you think that a postnatal visit is necessary to improve the mother and child's health | Yes | 6 | 3.8 | 119 | 76.3 |
| | | No | 69 | 44.2 | 33 | 21.2 |
| | | No idea | 81 | 51.9 | 4 | 2.6 |

Around 94.2% of the intervention group agreed that four postnatal visits were necessary during the postpartum period, compared to only 2.6% in control group. Additionally, 59.6% of the intervention group believed that knowing postnatal danger signs could reduce mortality, while only 1.9% of the control group held this view.

Regarding the necessity of postnatal visits to improve mother and child health, 76.3% of the intervention group agreed, compared to just 3.8% in control group. In contrast, a large proportion of the control group either disagreed or were unsure about these topics. These results highlight the effectiveness of the intervention in fostering positive attitudes towards postnatal care and the recognition of danger signs.

**Table 31. Distribution of participants according to attitude regarding breastfeeding in the control group and intervention group (n=312)**

| Sl. no | Attitude regarding breastfeeding | | Control group (n=156) | | Intervention Group (n=156) | |
|---|---|---|---|---|---|---|
| | | | Frequency | Percentage | Frequency | Percentage |
| a. | Do you believe your child requires pre-lacteal feedings | Yes | 145 | 92.9 | 38 | 24.4 |
| | | No | 11 | 7.1 | 118 | 75.6 |
| b. | Do you think that breastfeeding is good for mother and newborn | Yes | 10 | 6.4 | 106 | 67.9 |
| | | No | 146 | 93.6 | 50 | 32.1 |
| c. | Do you believe that breast milk alone is sufficient for the baby's growth till 6 months | Yes | 23 | 14.7 | 136 | 87.2 |
| | | No | 133 | 85.3 | 20 | 12.8 |

| | | | | | | |
|---|---|---|---|---|---|---|
| d. | Do you feel that breastfed babies are healthier than formula-fed babies | Yes | 116 | 74.4 | 12 | 7.7 |
| | | No | 40 | 25.6 | 144 | 92.3 |
| e. | Are you confident enough to express breast milk | Yes | 20 | 12.8 | 148 | 94.9 |
| | | No | 136 | 87.2 | 8 | 5.1 |

75.6% of the intervention group believed that their child did not require pre-lacteal feedings, compared to only 7.1% in control group. In contrast, 92.9% of the control group believed in the necessity of pre-lacteal feedings. Regarding benefits of breastfeeding, 67.9% of the intervention group recognized its advantages for mother and newborn, while only 6.4% in the control group held this view. The intervention group also had a much higher belief that breast milk alone is sufficient for a baby's growth until 6 months (87.2% vs. 14.7%) and felt that breastfed babies are healthier than formula-fed babies (92.3% vs. 25.6%). Additionally, 94.9% of the intervention group expressed confidence in breastfeeding, compared to only 12.8% in control group.

| **Table 32. Distribution of participants according to attitude regarding newborn care and immunization in the control group and intervention group (n=312)** | | | | | | |
|---|---|---|---|---|---|---|
| **Sl. no** | **Attitude regarding newborn care and immunization** | | **Control group (n=156)** | | **Intervention Group (n=156)** | |
| | | | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| a. | Do you think warming the baby is necessary | Yes | 36 | 23.1 | 134 | 85.9 |
| | | No | 120 | 76.9 | 22 | 14.1 |
| b. | Do you think that the diaper of baby should be changed regularly | Yes | 38 | 24.4 | 77 | 49.4 |
| | | No | 118 | 75.6 | 79 | 50.6 |
| c. | Do you think that the head and feet of baby should be covered to maintain the temperature | Yes | 21 | 13.5 | 123 | 78.8 |
| | | No | 135 | 86.5 | 33 | 21.2 |
| d. | Do you think vaccinating the newborn will prevent infection | Yes | 15 | 9.6 | 129 | 82.7 |
| | | No | 141 | 90.4 | 27 | 17.3 |

The intervention group demonstrated higher positive attitudes toward newborn care and immunization compared to control group. 85.9% of the intervention group believed warming the baby was necessary, while only 23.1% in control group held this view. Similarly, 49.4% of the intervention group agreed that diapers should be changed

regularly, compared to just 24.4% in control group. Additionally, 78.8% of the intervention group thought that covering the head and feet of the baby was essential to maintain temperature, whereas only 13.5% of the control group believed. Regarding newborn vaccinations, 82.7% of the intervention group believed they prevent infections, while only 9.6% of the control group shared this belief.

**Table 33. Distribution of participants according to attitude regarding personal hygiene and nutrition in the control group and Intervention group (n=312)**

| Sl. no | Attitude regarding personal hygiene and nutrition | | Control group (n=156) | | Intervention Group (n=156) | |
|---|---|---|---|---|---|---|
| | | | Frequency | Percentage | Frequency | Percentage |
| a. | Do you think washing hands before and after handling the baby is necessary | Yes | 34 | 21.8 | 134 | 85.9 |
| | | No | 122 | 78.2 | 22 | 14.1 |
| b. | Do you think that postnatal exercise helps speed recovery | Yes | 13 | 8.3 | 103 | 66.0 |
| | | No | 143 | 91.7 | 53 | 34.0 |
| c. | Do you think consuming iron tablets after delivery is good | Yes | 17 | 10.9 | 129 | 82.7 |
| | | No | 139 | 89.1 | 27 | 17.3 |

| | | | | | | |
|---|---|---|---|---|---|---|
| d. | Do you think that washing the perineum reduces the risk of infection | Yes | 15 | 9.6 | 131 | 84.0 |
| | | No | 141 | 90.4 | 25 | 16.0 |
| e. | Do you think lifting weight delays in healing surgical scars | Yes | 9 | 5.8 | 132 | 84.6 |
| | | No | 147 | 94.2 | 24 | 15.4 |

Around 85.9% of the intervention group understood the importance of washing hands before and after handling the baby, compared to just 21.8% in the control group. Similarly, 66.0% of the intervention group believed postnatal exercise aids recovery, while only 8.3% in control group agreed. Knowledge about the benefits of consuming iron tablets after delivery was also higher in the intervention group (82.7% vs. 10.9%). The intervention group showed more awareness regarding perineal hygiene (84.0% vs. 9.6%) and the impact of weight lifting on healing surgical scars (84.6% vs. 5.8%). These results indicate that the intervention significantly improved participants' attitudes and awareness regarding key aspects of postnatal personal hygiene and nutrition, contributing to better health practices.

**Table 34. Distribution of participants according to attitude regarding family planning measures in the control group and intervention group (n=312)**

| Sl. no | Attitude regarding family planning measures | | Control group (n=156) | | Intervention Group (n=156) | |
|---|---|---|---|---|---|---|
| | | | Frequency | Percentage | Frequency | Percentage |
| a. | Do you think that breastfeeding alone will help you in contraception | Yes | 12 | 7.7 | 132 | 84.6 |
| | | No | 122 | 78.2 | 24 | 15.4 |
| | | No idea | 22 | 14.1 | 0 | 0 |
| b. | Do you think that taking OCP will reduce the secretion of breast milk | Yes | 11 | 7.1 | 83 | 53.2 |
| | | No | 58 | 37.2 | 61 | 39.1 |
| | | No idea | 87 | 55.8 | 12 | 7.7 |

Majority, 84.6% of the intervention group believed breastfeeding alone could serve as contraception, compared to just 7.7% in the control group. Additionally, 53.2% of the intervention group thought oral contraceptive pills (OCP) could reduce breast milk secretion, while only 7.1% of the control group agreed.

| Table 35. Distribution of participants according to practice regarding postnatal visits (n=312) | | | | |
|---|---|---|---|---|
| **Attended postnatal visit** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| Yes | 77 | 49.4 | 154 | 98.7 |
| No | 79 | 50.6 | 2 | 1.3 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

In the control group, 50.6% failed to attend, whereas only 1.3% of the intervention group missed their visit.

| Table 36. Distribution of participants according to practice regarding the number of postnatal visits (n=312) | | | | |
|---|---|---|---|---|
| **How many postnatal visits attended** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| Not answered | 79 | 50.6 | 2 | 1.2 |
| 2 visits | 19 | 12.2 | 5 | 3.2 |
| 3 visits | 46 | 29.5 | 72 | 46.2 |
| 4 visits | 12 | 7.7 | 77 | 49.4 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

Control group had a non-response rate of 50.6%, while only 1.2% of the intervention group did not respond. Additionally, a higher percentage of participants in the intervention group attended three or four visits (95.6%) compared to 37.2% in the control group.

| **Table 37. Distribution of participants according to practice regarding breastfeeding in the control group and intervention group (n=312)** | | | | | | |
|---|---|---|---|---|---|---|
| **Sl. no** | **Practice regarding breastfeeding** | | **Control group (n=156)** | | **Intervention Group (n=156)** | |
| | | | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| a. | Did you give colostrum to the baby | Yes | 119 | 76.3 | 141 | 90.4 |
| | | No | 37 | 23.7 | 15 | 9.6 |
| b. | Do you feed newborns on demand | Yes | 50 | 32.1 | 128 | 82.1 |
| | | No | 106 | 67.9 | 28 | 17.9 |
| c. | Did you practice burping after every feed | Yes | 94 | 60.3 | 117 | 75.0 |
| | | No | 62 | 39.7 | 39 | 25.0 |
| d. | Do you wake up your baby at night for feeding | Yes | 63 | 40.4 | 113 | 72.4 |
| | | No | 93 | 59.6 | 43 | 27.6 |

Around 90.4% of the intervention group gave colostrum to their baby, compared to 76.3% in the control group. Additionally, 82.1% of the intervention group fed newborns on demand, while only 32.1% of the control group did so. Burping after every feed was practiced by 75.0% of the intervention group, compared to 60.3% in the control group. Furthermore, 72.4% of the intervention group woke their baby at night for feeding, compared to 40.4% in control group.

| Table 38. Distribution of participants according to practice regarding initiation time of breastfeeding (n=312) | | | | |
|---|---|---|---|---|
| **At what time breastfeeding was initiated** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| <1 hr | 61 | 39.1 | 130 | 83.3 |
| 1 hr – 24 hr | 84 | 53.8 | 26 | 16.7 |
| 1 day – 5 days | 11 | 7.1 | 0 | 0 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

Intervention group demonstrated better breastfeeding initiation practices, 83.3% initiated in one hour compared to 39.1% in the control group. Additionally, no participants in intervention group delayed breastfeeding, while 7.1% of the control group initiated breastfeeding after 1-5 days.

| Table 39. Distribution of participants according to practice regarding newborn care and immunization in the control group and intervention group (n=312) | | | | | | |
|---|---|---|---|---|---|---|
| **Sl. no** | **Practice regarding newborn care and immunization** | | **Control group (n=156)** | | **Intervention Group (n=156)** | |
| | | | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| a. | Did you bath the newborn immediately after birth | Yes | 129 | 82.7 | 35 | 22.4 |
| | | No | 27 | 17.3 | 121 | 77.6 |
| b. | Did you keep the baby warm by attaching with you | Yes | 35 | 22.4 | 135 | 86.5 |
| | | No | 121 | 77.6 | 21 | 13.5 |
| c. | Did you wrap the newborn with warm clothes | Yes | 36 | 23.1 | 123 | 78.8 |
| | | No | 120 | 76.9 | 33 | 21.2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| d. | Did you keep your room warm | Yes | 48 | 30.8 | 138 | 88.5 |
| | | No | 108 | 69.2 | 18 | 11.5 |
| e. | Whether you use diapers for the baby | Yes | 69 | 44.2 | 138 | 88.5 |
| | | No | 87 | 55.8 | 18 | 11.5 |
| f. | Are you cleaning the perineum of the newborn after changing diaper | Yes | 20 | 12.8 | 129 | 82.7 |
| | | No | 136 | 87.2 | 27 | 17.3 |

In the intervention group 77.6% of participants avoided bathing the newborn immediately after birth, whereas only 17.3% of the control group did the same. Furthermore, 86.5% of the intervention group kept the newborn warm by attaching the baby against themselves, in contrast to just 22.4% of the control group. The intervention group also showed greater practice towards wrapping the newborn in warm clothing (78.8% vs. 23.1%) and ensuring the room was kept warm (88.5% vs. 30.8%). And more over 88.5% of the intervention group utilized diapers for the newborn, while only 44.2% in the control group did so. Regarding perineal hygiene, 82.7% of the intervention group cleaned the perineum following diaper changes, compared to just 12.8% of the control group.

| **Table 40. Distribution of participants according to practice regarding personal hygiene and nutrition in the control group and intervention group (n=312)** | | | | | | |
|---|---|---|---|---|---|---|
| **Sl. no** | **Practice regarding personal hygiene and nutrition** | | **Control group (n=156)** | | **Intervention Group (n=156)** | |
| | | | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| a. | Do you wash your hands before and after handling the newborn | Yes | 56 | 35.9 | 142 | 91.0 |
| | | No | 100 | 64.1 | 14 | 9.0 |
| b. | Have you ever done postnatal exercise | Yes | 13 | 8.3 | 63 | 40.4 |
| | | No | 143 | 91.7 | 93 | 59.6 |
| c. | Are you taking adequate rest | Yes | 26 | 16.7 | 145 | 92.9 |
| | | No | 130 | 83.3 | 11 | 7.1 |

Majority of the intervention group reported washing their hands before and after handling the newborn (91.0% vs. 35.9%). Additionally, 40.4% of the intervention group engaged in postnatal exercise compared to only 8.3% in control group. Most notably, 92.9% of the intervention group reported taking adequate rest, as opposed to just 16.7% of the control group.

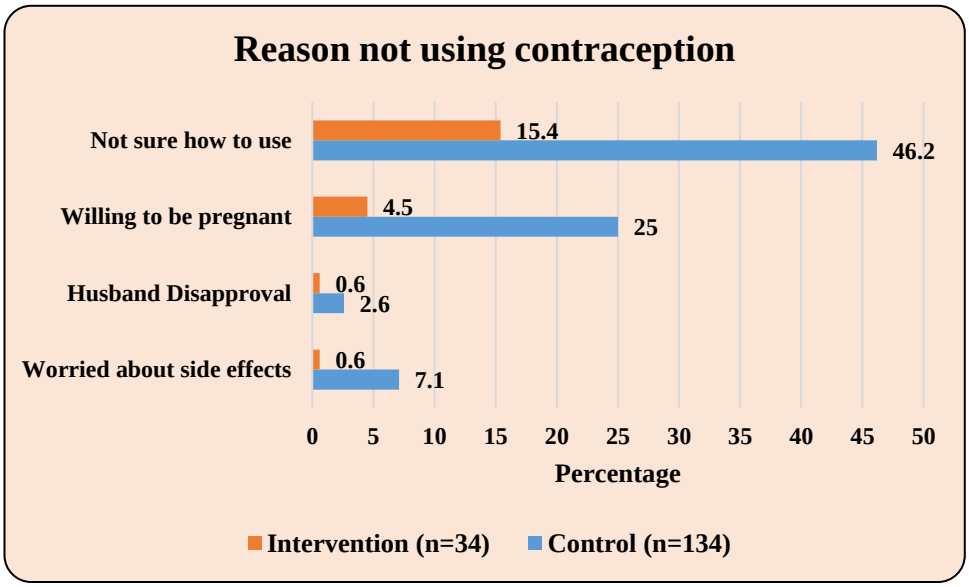
| **Table 41. Distribution of participants according to practice regarding water consumption (n=312)** | | | | |
|---|---|---|---|---|
| **How many litres of water you are consuming per day** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| 1 – 3 litres | 140 | 89.7 | 28 | 17.9 |
| 4 – 6 litres | 16 | 10.3 | 128 | 82.1 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

While 89.7% of the control group consumed 1–3 litres of water daily, only 17.9% of the intervention group did. Conversely, 82.1% of the intervention group consumed 4–6 litres.

| **Table 42. Distribution of participants according to practice regarding methods of contraception used (n=312)** | | | | |
|---|---|---|---|---|
| **Whether you have used any methods of contraception** | **Control Group (n=156)** | | **Intervention Group (n=156)** | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| Yes | 22 | 13.5 | 122 | 77.6 |
| No | 134 | 86.5 | 34 | 22.4 |
| **Total** | **156** | **100.0** | **156** | **100.0** |

Intervention group exhibited higher contraceptive use compared to control group. While only 13.5% of the control group reported using contraception, 77.6% of the intervention group used some form of contraception.

**Fig.7. Distribution of participants according to reason not using contraception**




In the control group, most participants do not use contraception due to lack of awareness about its usage, willing to become pregnant, and other factors. In contrast, the intervention group has shown an increase in knowledge about how to use contraception when compared to control group.

| Table 43. Comparison of Control group and Intervention group Individual Knowledge scores (n=312) | | | | | |
|---|---|---|---|---|---|
| **Knowledge Score** | **Mean** | **SD** | **Median** | **Minimum** | **Maximum** |
| **Postnatal Visits and Postnatal Danger signs** | | | | | |
| **Control Group** | 1.48 | 1.64 | 1.00 | 0 | 9 |
| **Intervention Group** | 3.85 | 0.98 | 4.00 | 3 | 8 |
| **Total** | 2.66 | 1.79 | 3.00 | 0 | 9 |
| **Breastfeeding** | | | | | |
| **Control Group** | 6.58 | 2.72 | 7.00 | 1 | 16 |
| **Intervention Group** | 10.79 | 1.58 | 11.00 | 6 | 16 |
| **Total** | 8.68 | 3.06 | 9.00 | 1 | 16 |
| **Newborn care and Immunization** | | | | | |
| **Control Group** | 5.83 | 3.14 | 6.00 | 0 | 15 |
| **Intervention Group** | 9.99 | 1.87 | 10.00 | 3 | 15 |
| **Total** | 7.91 | 3.32 | 9.00 | 0 | 15 |
| **Personal Hygiene and Nutrition** | | | | | |
| **Control Group** | 8.40 | 1.95 | 8.00 | 4 | 15 |
| **Intervention Group** | 10.64 | 1.45 | 11.00 | 5 | 14 |
| **Total** | 9.52 | 2.05 | 10.00 | 4 | 15 |
| **Family Planning Measures** | | | | | |
| **Control Group** | 27.08 | 6.46 | 27.00 | 12 | 51 |
| **Intervention Group** | 3.98 | 1.58 | 4.00 | 2 | 8 |
| **Total** | 4.39 | 1.38 | 5.00 | 1 | 8 |

The comparison of individual knowledge scores between control and intervention groups revealed disparities across different domains. For postnatal visits and danger signs, intervention group had a mean score of 3.85, much higher than control group's 1.48. Similarly, in breastfeeding, intervention group scored 10.79, compared to control group's 6.58. In newborn care and immunization, intervention group achieved a score of 9.99, surpassing control group's 5.83. Regarding personal hygiene and nutrition, intervention group had a mean score of 10.64, outperforming control group's 8.40. However, control group scored higher on family planning measures, with a mean of 27.08, compared to 3.98 for intervention group. Overall, the intervention group demonstrated better knowledge in postnatal care, breastfeeding, newborn care, and hygiene, with most substantial improvements observed in first three domains.

**Table 44. Comparison of Control group and Intervention group Total Knowledge scores (n=312)**

| **Total Knowledge Scores** | **Control Group** | **Intervention Group** | **Total** |
|---|---|---|---|
| **Mean ± SD** | 27.08 ± 6.46 | 39.25 ± 3.93 | 33.16 ± 8.10 |
| **Median** | 27 | 39 | 35 |
| **Minimum Score** | 12 | 26 | 12 |
| **Maximum Score** | 51 | 50 | 51 |
| **Mean Difference** | 12.17 (10.98 – 13.36) | | |
| **p-value** | <0.001* | | |
| **p value < 0.05 statistically significant* | | | |

The normality of the Knowledge scores was assessed using Kolmogorov-Smirnov test, which indicated that the scores were normally distributed in both control and intervention groups ($p > 0.05$). To compare postnatal care knowledge scores between two groups, an unpaired t-test was performed. The results showed a significant difference, with intervention group scoring significantly higher than control group ($p < 0.001$). The calculated effect size was 2.28, suggesting a large effect.

| Table 45. Comparison of Control group and Intervention group Individual Attitude scores (n=312) | | | | | |
|---|---|---|---|---|---|
| **Attitude Score** | **Mean** | **SD** | **Median** | **Minimum** | **Maximum** |
| **Postnatal Visits and Postnatal Danger signs** | | | | | |
| **Control Group** | 0.08 | 0.38 | 0 | 0 | 3 |
| **Intervention Group** | 2.30 | 0.69 | 2 | 0 | 3 |
| **Total** | 1.19 | 1.24 | 1 | 0 | 3 |
| **Breastfeeding** | | | | | |
| **Control Group** | 4.56 | 1.07 | 5 | 1 | 8 |
| **Intervention Group** | 4.78 | 1.26 | 5 | 1 | 8 |
| **Total** | 4.67 | 1.17 | 5 | 1 | 8 |
| **Newborn care and Immunization** | | | | | |
| **Control Group** | 2.65 | 0.86 | 2 | 1 | 5 |
| **Intervention Group** | 4.26 | 0.70 | 4 | 3 | 6 |
| **Total** | 3.46 | 1.12 | 4 | 1 | 6 |
| **Personal Hygiene and Nutrition** | | | | | |
| **Control Group** | 1.46 | 0.97 | 1 | 0 | 5 |
| **Intervention Group** | 3.96 | 1.02 | 4 | 1 | 6 |
| **Total** | 2.71 | 1.60 | 3 | 0 | 6 |
| **Family Planning Measures** | | | | | |
| **Control Group** | 2.90 | 0.64 | 3 | 1 | 5 |
| **Intervention Group** | 3.51 | 0.92 | 3.5 | 1 | 6 |
| **Total** | 3.21 | 0.85 | 3 | 1 | 6 |

The comparison of attitude scores between control and intervention groups shows differences across various areas. For postnatal care (PNC), intervention group had a

much higher mean score of 2.30, compared to just 0.08 in control group. Regarding breastfeeding, intervention group scored 4.78, slightly above control group's mean of 4.56. The intervention group also had higher scores for newborn care, with a mean of 4.26, while control group scored 2.65. In personal hygiene and nutrition, intervention group's mean was 3.96, compared to 1.46 in control group. For family planning measures, intervention group's mean score was 3.51, surpassing control group's 2.90. The total attitude score was higher in intervention group (18.81) than in control group (11.67), reflecting a substantial improvement in intervention group's attitudes towards postnatal care.

**Table 46. Comparison of Control group and Intervention group Total Attitude scores (n=312)**

| **Total Attitude Scores** | **Control Group** | **Intervention Group** | **Total** |
|---|---|---|---|
| **Mean ± SD** | 11.67 ± 1.98 | 18.81 ± 2.16 | 15.24 ± 4.13 |
| **Median** | 11 | 19 | 15 |
| **Minimum Score** | 7 | 12 | 7 |
| **Maximum Score** | 19 | 24 | 24 |
| **Mean Rank** | 80.91 | 232.09 | - |
| **Z – Value** | 14.85 | | |
| **p-value** | <0.001* | | |
| **p value < 0.05 statistically significant* | | | |

The Kolmogorov-Smirnov test was employed to evaluate the normality of Attitude scores, revealing that the scores were not normally distributed in either control or intervention group ($p < 0.05$). As a result, Mann-Whitney U test was used to relate attitude scores regarding postnatal care between two groups. The findings indicated a significant difference, with intervention group exhibiting higher mean ranks and medians, reflecting significantly better attitude scores compared to control group ($p < 0.001$). The effect size was calculated as 0.84, indicating a large effect.

| Table 47. Comparison of Control group and Intervention group Individual Practice scores (n=312) | | | | | |
|---|---|---|---|---|---|
| **Practice Score** | **Mean** | **SD** | **Median** | **Minimum** | **Maximum** |
| **Postnatal Visits and Postnatal Danger signs** | | | | | |
| **Control Group** | 0.49 | 0.50 | 0 | 0 | 1 |
| **Intervention Group** | 0.99 | 0.11 | 1 | 0 | 1 |
| **Total** | 0.74 | 0.44 | 1 | 0 | 1 |
| **Breastfeeding** | | | | | |
| **Control Group** | 4.93 | 1.48 | 5 | 0 | 9 |
| **Intervention Group** | 4.64 | 1.22 | 5 | 1 | 7 |
| **Total** | 4.79 | 1.36 | 5 | 0 | 9 |
| **Newborn care and Immunization** | | | | | |
| **Control Group** | 2.38 | 1.15 | 2 | 0 | 6 |
| **Intervention Group** | 4.47 | 0.99 | 5 | 2 | 6 |
| **Total** | 3.43 | 1.50 | 3.5 | 0 | 6 |
| **Personal Hygiene and Nutrition** | | | | | |
| **Control Group** | 0.71 | 0.89 | 0 | 0 | 4 |
| **Intervention Group** | 3.06 | 0.77 | 3 | 0 | 4 |
| **Total** | 1.89 | 1.44 | 2 | 0 | 4 |
| **Family Planning Measures** | | | | | |
| **Control Group** | 0.32 | 0.57 | 0 | 0 | 2 |
| **Intervention Group** | 1.57 | 0.66 | 2 | 0 | 2 |
| **Total** | 0.95 | 0.88 | 1 | 0 | 2 |

The analysis of practice scores between control and intervention groups indicates notable differences across all categories. In postnatal care (PNC), intervention group scored higher (mean = 0.99) compared to control group (mean = 0.49), indicating

improved practices. For breastfeeding, control group scored slightly higher (mean = 4.93) than intervention group (mean = 4.64). However, intervention group performed better in newborn care, achieving a mean score of 4.47 versus 2.38 for control group. Regarding personal hygiene, intervention group's mean score (3.06) was significantly higher than control group's (0.71). In family planning practices, intervention group scored 1.57, whereas control group had lower score of 0.32. Overall, the total practice score for intervention group was 14.74, compared to 8.83 for control group, demonstrating higher practices scores across all domains in intervention group.

**Table 48. Comparison of Control group and Intervention group Total Practice scores (n=312)**

| Total Practice Scores | Control Group | Intervention Group | Total |
|---|---|---|---|
| **Mean ± SD** | 8.83 ± 2.76 | 14.74 ± 2.17 | 11.79 ± 3.86 |
| **Median** | 8 | 15 | 12 |
| **Minimum Score** | 3 | 8 | 3 |
| **Maximum Score** | 16 | 19 | 19 |
| **Mean Rank** | 87.33 | 225.67 | -- |
| **Z – Value** | 13.58 | | |
| **p-value** | <0.001* | | |
| **p value < 0.05 statistically significant* | | | |

The Kolmogorov-Smirnov test was conducted to check the normality of Practice scores and found that the scores were not normally distributed in either the control or intervention group ($p < 0.05$). Therefore, Mann-Whitney U test was applied to compare practice scores related to postnatal care between groups. The results indicated a significant difference, with intervention group showing higher mean ranks and medians, suggesting better practice scores than control group ($p < 0.001$). The calculated effect size of 0.77 indicates a large effect, demonstrating a significant disparity in practice scores between two groups.

| **Table 49. Correlation analysis between knowledge, attitude and practice of Control group and Intervention group** | | | | | |
|---|---|---|---|---|---|
| | | | **Knowledge** | **Attitude** | **Practice** |
| **Control Group** | **Knowledge** | Correlation Coefficient | 1 | 0.171 | 0.266 |
| | | Sig. (2-tailed) | - | 0.033* | 0.001* |
| | **Attitude** | Correlation Coefficient | 0.171 | 1 | 0.192 |
| | | Sig. (2-tailed) | 0.033* | - | 0.016* |
| | **Practice** | Correlation Coefficient | 0.266 | 0.192 | 1 |
| | | Sig. (2-tailed) | 0.001* | 0.016* | - |
| **Intervention Group** | **Knowledge** | Correlation Coefficient | 1 | -0.035 | 0.029 |
| | | Sig. (2-tailed) | - | 0.663 | 0.724 |
| | **Attitude** | Correlation Coefficient | -0.035 | 1 | -0.007 |
| | | Sig. (2-tailed) | 0.663 | | 0.928 |
| | **Practice** | Correlation Coefficient | 0.029 | -0.007 | 1 |
| | | Sig. (2-tailed) | 0.724 | 0.928 | - |
| ** Statistically significant* | | | | | |

Spearman's correlation analysis revealed weak positive correlations in control group, but statistically significant correlations were found among Knowledge and Attitude (0.171), Knowledge and Practice (0.266) and Attitude and Practice (0.192).This indicates that individuals with higher knowledge were weakly associated with slightly better attitudes and practices. Additionally, improved attitudes showed a slight connection to better practices. In contrast, intervention group exhibited no significant correlations. This suggests that while intervention may have independently improved knowledge, attitude and practice but did not create any relationships between these variables.

**Fig.8. Comparison of correlation between control and intervention groups according to Knowledge and Attitude Scores (n=312)**

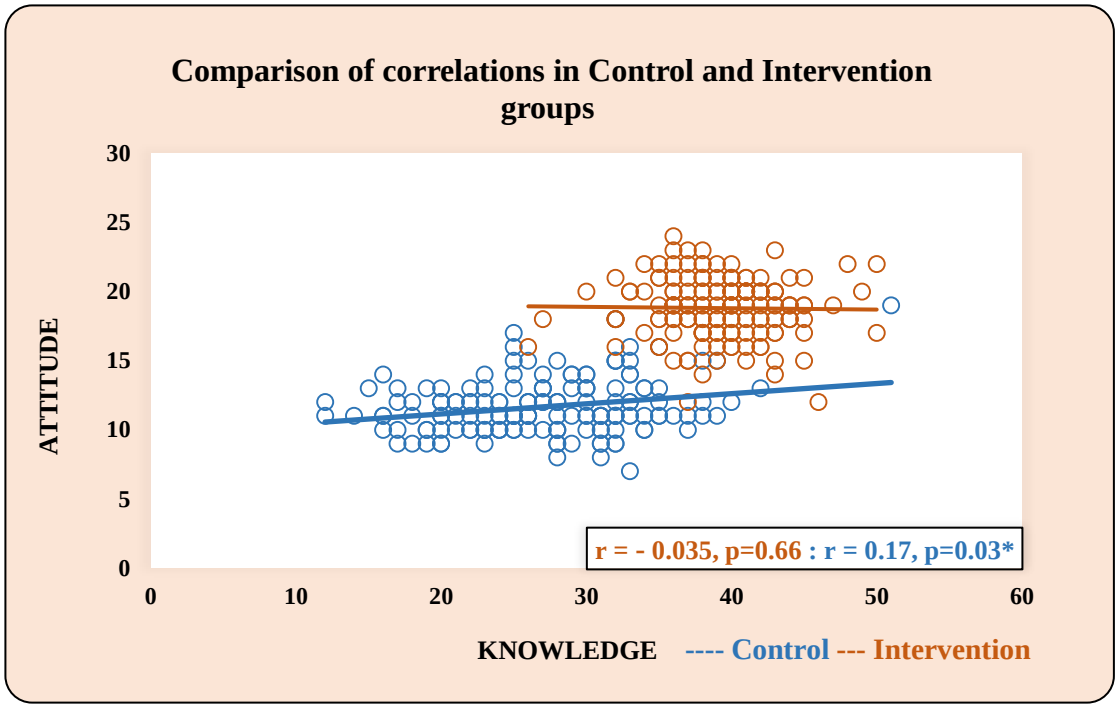



**Fig.9. Comparison of correlation between control and intervention groups according to Attitude and Practice Scores (n=312)**

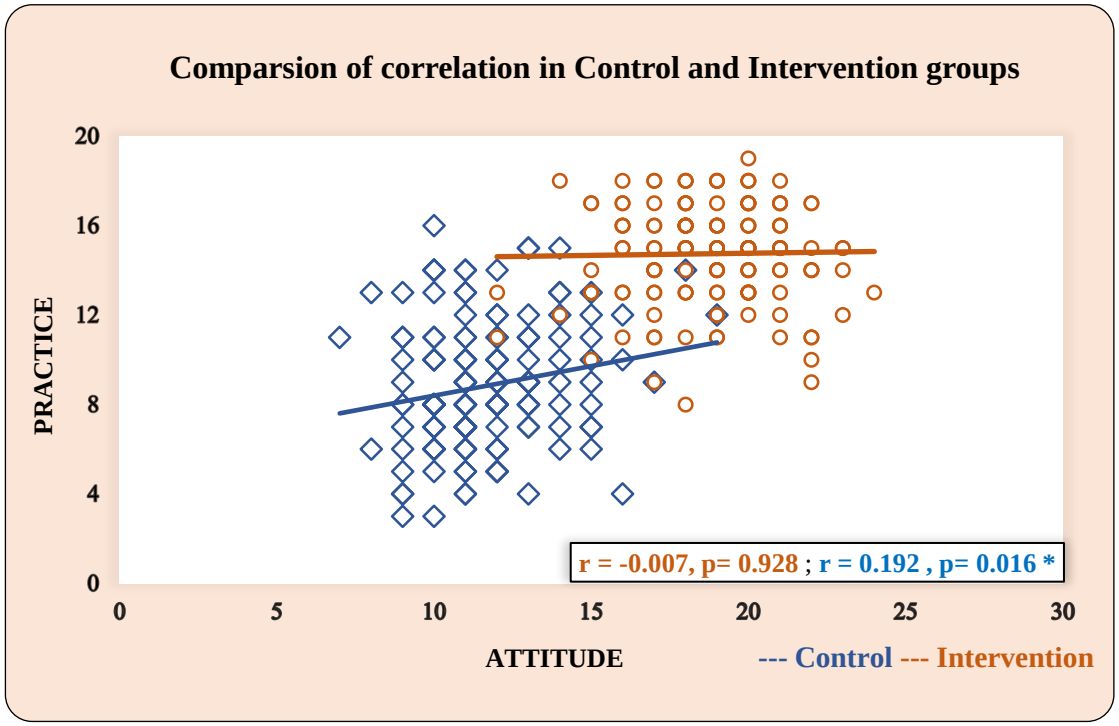
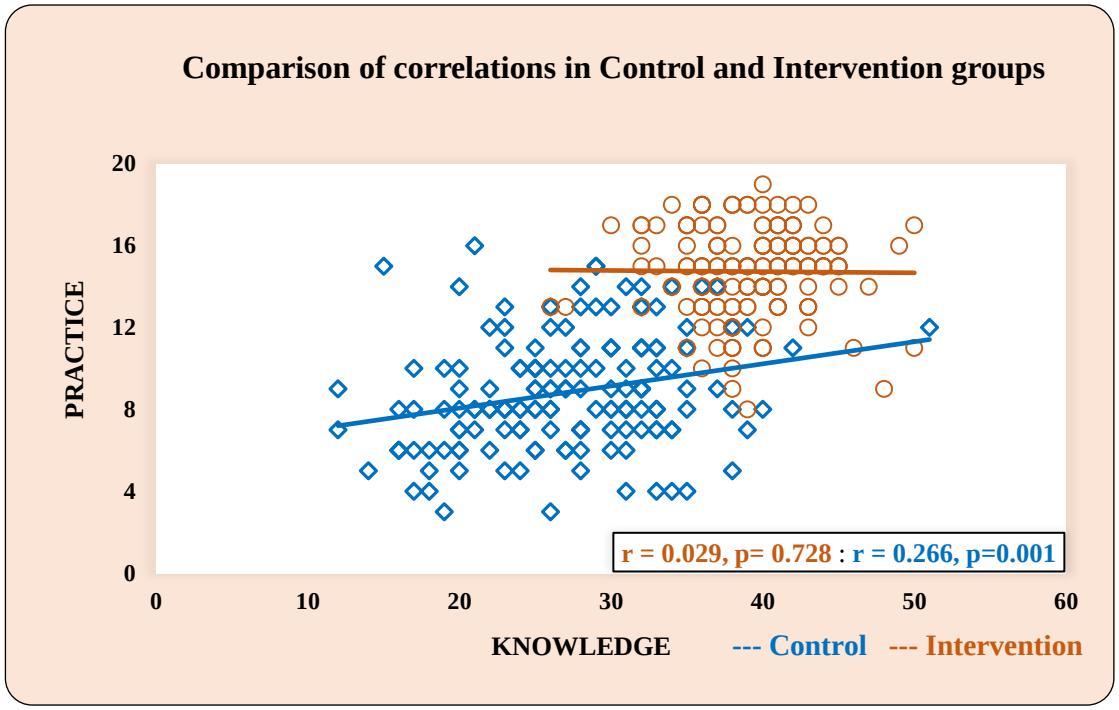


**Fig.10. Comparison of correlation between control and intervention groups according to Knowledge and Practice Scores (n=312)**



| Table 50. Factors influencing on postnatal care knowledge | | | | |
|---|---|---|---|---|
| **Control Group** | **Unstandardized Coefficients** | **95.0% Confidence Interval** | **Standardized Coefficients (Beta)** | **Significant** |
| **Religion** | | | | |
| Hindu | -2.63 | [-5.78,0.52] | -0.15 | 0.10 |
| Muslim (Ref) | | | | |
| **Age** | | | | |
| 21-25 years | 0.96 | [-2.10,4.03] | 0.07 | 0.54 |
| ≥ 26 years | -0.74 | [-3.93, 2.45] | -0.06 | 0.65 |
| ≤ 20 years (Ref) | | | | |
| **Mother's Education** | | | | |
| Primary / Secondary | 0.71 | [-3.78, 5.21] | 0.05 | 0.75 |
| Higher Secondary | 3.94 | [-0.56, 8.45] | 0.30 | 0.09 |
| PUC or Graduate | 5.19 | [0.17, 10.20] | 0.35 | 0.04* |
| Illiterate (Ref) | | | | |
| **Occupation of Mother** | | | | |
| Unemployed | 0.94 | [-1.56,3.45] | 0.06 | 0.46 |
| Others (Ref) | | | | |
| **Type of family** | | | | |
| Joint | -1.54 | [-4.69,1.61] | -0.10 | 0.34 |
| Nuclear(Ref) | | | | |
| **Socio economic status (SES)** | | | | |
| Class III | 2.48 | [ 0.00, 4.96] | 0.19 | 0.05 |
| Class IV | -2.47 | [-4.58, -0.37] | -0.24 | 0.02* |
| Class V | -1.49 | [-3.37,- 0.39] | -0.19 | 0.12 |
| Class I or II (Ref) | | | | |
| **Have BPL Card** | | | | |
| No | -1.26 | [-3.47,0.95] | 0.11 | 0.19 |
| Yes (Ref) | | | | |
| **Type of Delivery** | | | | |
| Others | -2.33 | [-4.57,-0.09] | -0.17 | 0.04* |
| Normal(Ref) | | | | |
| **Comorbidity** | | | | |
| None | 5.33 | [1.15,9.52] | 0.21 | 0.01 |

| | | | | |
|---|---|---|---|---|
| Anemia | 3.04 | [-0.45,6.54] | 0.14 | 0.09 |
| Other (Ref) | | | | |
| **Intervention Group** | **Unstandardized Coefficients** | **95.0% Confidence Interval** | **Standardized Coefficients (Beta)** | **Significant** |
| **Religion** | | | | |
| Hindu | 2.21 | [0.16,4.58] | 0.16 | 0.07 |
| Muslim (Ref) | | | | |
| **Age** | | | | |
| 21-25 years | 1.39 | [-0.19,2.96] | 0.18 | 0.08 |
| ≥ 26 years | 1.73 | [-0.32,3.78] | 0.19 | 0.10 |
| ≤ 20 years (Ref) | | | | |
| **Mother's Education** | | | | |
| Primary / Secondary | -0.85 | [-3.50,1.80] | -0.10 | 0.53 |
| Higher Secondary | -0.34 | [-2.95,2.27] | --0.04 | 0.80 |
| PUC or Graduate | 0.18 | [-3.32,3.69] | 0.02 | 0.92 |
| Illiterate (Ref) | | | | |
| **Occupation of Mother** | | | | |
| Unemployed | 1.24 | [-0.76,3.24] | 0.11 | 0.22 |
| Others (Ref) | | | | |
| **Type of family** | | | | |
| Joint | -0.81 | [-1.39,2.00] | 0.03 | 0.73 |
| Nuclear(Ref) | | | | |
| **Socio economic status (SES)** | | | | |
| Class III | 2.48 | [0,4.96] | 0.19 | 0.05 |
| Class IV | -2.47 | [-4.58,-0.37] | -0.24 | 0.02* |
| Class V | -1.49 | [-3.37,0.39] | -0.19 | 0.12 |
| Class I or II (Ref) | | | | |
| **Have BPL Card** | | | | |
| No | -0.79 | [-2.15,0.58] | -0.10 | 0.26 |
| Yes (Ref) | | | | |
| **Age at menarche** | | | | |
| ≤ 12 years | 1.46 | [0.08,2.85] | 0.18 | 0.04* |
| ≥ 13 years (Ref) | | | | |

| | | | | |
|---|---|---|---|---|
| **Type of Delivery** | | | | |
| Others | -2.33 | [-4.57,-0.09] | 0.17 | 0.04* |
| Normal( Ref) | | | | |
| **Comorbidity** | | | | |
| None | -1.00 | [-2.37,0.38] | -0.13 | 0.15 |
| Anemia | 1.01 | [-1.45,3.47] | 0.07 | 0.42 |
| Other (Ref) | | | | |
| **p value < 0.05 statistically significant* | | | | |

Multiple linear regression analysis was carried out to evaluate the effect of independent variables on knowledge scores in both control and intervention groups. The regression analysis showed that compared to illiterate individuals, those with PUC (Pre-University Course) or graduation scored an average of 5.19 units higher in knowledge. Additionally, women without comorbidities scored an average of 5.33 units higher than those with conditions such as GDM (Gestational Diabetes Mellitus), PIH (Pregnancy-Induced Hypertension), GDM combined with PIH and others which was statistically significant. No other variables showed significant associations in control group.

In intervention group, individuals from SES (Socioeconomic Status) class IV scored an average of 2.47 points lower in knowledge compared to those from SES class I or II. Women who experienced puberty before the age of 12 had an average knowledge score that was 1.46 points higher than those who began puberty at age 13 or older. Regarding type of delivery, women with Cesarean section scored 2.33 points lower in knowledge compared to those with normal delivery. Additionally, women with irregular menstrual cycles scored an average of 1.86 points lower than those with regular cycles. No other variables found to be significant.

| Table 51. Factors influencing on postnatal care attitude | | | | |
|---|---|---|---|---|
| **Control Group** | **Unstandardized Coefficients** | **95.0% Confidence Interval** | **Standardized Coefficients (Beta)** | **Significant** |
| **Religion** | | | | |
| Hindu | -0.75 | [-1.78,0.26] | -0.14 | 0.14 |
| Muslim (Ref) | | | | |
| **Age** | | | | |
| 21-25 years | 0.396 | [-0.59,1.39] | 0.09 | 0.43 |
| ≥ 26 years | 0.79 | [-0.247,1.82] | 0.19 | 0.13 |
| ≤ 20 years (Ref) | | | | |
| **Mother's Education** | | | | |
| Primary / Secondary | -0.03 | [-1.49,1.42] | -0.08 | 0.96 |
| Higher Secondary | 0.52 | [-0.93,1.98] | 0.12 | 0.47 |
| PUC or Graduate | 0.17 | [-1.45,1.80] | 0.03 | 0.83 |
| Illiterate (Ref) | | | | |
| **Occupation of Mother** | | | | |
| Unemployed | -0.28 | [-1.09,0.53] | -0.06 | 0.49 |
| Others (Ref) | | | | |
| **Type of family** | | | | |
| Joint | -0.09 | [-1.17,0.92] | -0.02 | 0.85 |
| Nuclear(Ref) | | | | |
| **Socio economic status (SES)** | | | | |
| Class III | 1.12 | [-0.22,2.48] | 0.22 | 0.10 |
| Class IV | 0.07 | [-1.33,1.48] | 0.01 | 0.91 |
| Class V | 0.22 | [-1.14,1.60] | 0.05 | 0.74 |
| Class I or II (Ref) | | | | |
| **Have BPL Card** | | | | |
| No | -0.08 | [-0.8,0.63] | -0.02 | 0.82 |
| Yes (Ref) | | | | |
| **Type of Delivery** | | | | |
| Others | -0.40 | [-1.143,0.32] | -0.10 | 0.27 |
| Normal (Ref) | | | | |
| **Comorbidity** | | | | |
| None | 0.474 | [-0.88,1.83] | 0.06 | 0.49 |
| Anemia | 0.082 | [-1.05,1.21] | 0.01 | 0.88 |

| Other (Ref) | | | | |
|---|---|---|---|---|
| **Intervention Group** | **Unstandardized Coefficients** | **95.0% Confidence Interval** | **Standardized Coefficients (Beta)** | **Significant** |
| **Religion** | | | | |
| Hindu | 0.41 | [-0.93,1.75] | 0.05 | 0.54 |
| Muslim (Ref) | | | | |
| **Age** | | | | |
| 21-25 years | 0.16 | [-0.72,1.06] | 0.03 | 0.71 |
| ≥ 26 years | 0.93 | [-0.23,2.10] | 0.18 | 0.11 |
| ≤ 20 years (Ref) | | | | |
| **Mother's Education** | | | | |
| Primary / Secondary | 0.78 | [-0.73,2.28] | 0.16 | 0.30 |
| Higher Secondary | 0.29 | [-1.19,1.77] | 0.06 | 0.69 |
| PUC or Graduate | -0.57 | [-2.56,1.42] | -0.08 | 0.57 |
| Illiterate (Ref) | | | | |
| **Occupation of Mother** | | | | |
| Unemployed | -0.64 | [-1.78,0.49] | -0.10 | 0.26 |
| Others (Ref) | | | | |
| **Type of family** | | | | |
| Joint | 0.57 | [-0.482,1.63] | 0.11 | 0.28 |
| Nuclear(Ref) | | | | |
| **Socio economic status (SES)** | | | | |
| Class III | -0.50 | [-1.91,0.90] | -0.07 | 0.48 |
| Class IV | -0.27 | [-1.47,0.92] | -0.04 | 0.64 |
| Class V | -0.79 | [-1.87,0.27] | -0.12 | 0.14 |
| Class I or II (Ref) | | | | |
| **Have BPL Card** | | | | |
| No | -0.43 | [-1.21,0.34] | -0.098 | 0.27 |
| Yes (Ref) | | | | |
| **Age at menarche** | | | | |
| ≤ 12 years | 0.20 | [-0.58,0.99] | 0.04 | 0.61 |
| ≥ 13 years (Ref) | | | | |

| | | | | |
|---|---|---|---|---|
| **Type of Delivery** | | | | |
| Others | 0.33 | [-0.94,1.60] | 0.04 | 0.61 |
| Normal( Ref) | | | | |
| **Comorbidity** | | | | |
| None | 0.87 | [0.08,1.65] | 0.20 | 0.03* |
| Anemia | 0.30 | [-1.09,1.70] | 0.04 | 0.66 |
| Other (Ref) | | | | |
| **p value < 0.05 statistically significant* | | | | |

Compared to women with comorbidities such as GDM (Gestational Diabetes Mellitus), PIH (Pregnancy-Induced Hypertension), or GDM combined with PIH those with no comorbidities achieved an average score that was 0.87 points higher which was statistically significant. No other variables found to be significant in intervention group. None of the variables were significant in control group.

| Table 52. Factors influencing on postnatal care practice | | | | |
|---|---|---|---|---|
| **Control Group** | **Unstandardized Coefficients** | **95.0% Confidence Interval** | **Standardized Coefficients (Beta)** | **Significant** |
| **Religion** | | | | |
| Hindu | -1.48 | [-2.85,0.11] | -0.19 | 0.03* |
| Muslim (Ref) | | | | |
| **Age** | | | | |
| 21-25 years | 0.76 | [-0.55,2.09] | 0.13 | 0.25 |
| ≥ 26 years | 0.52 | [-0.85,1.91] | 0.09 | 0.45 |
| ≤ 20 years (Ref) | | | | |
| **Mother's Education** | | | | |
| Primary / Secondary | 1.07 | [-0.88,3.02] | 0.17 | 0.28 |
| Higher Secondary | 1.66 | [-0.28,3.62] | 0.29 | 0.09 |
| PUC or Graduate | 1.22 | [-0.95,3.4] | 0.19 | 0.26 |
| Illiterate (Ref) | | | | |
| **Occupation of Mother** | | | | |
| Unemployed | 0.668 | [-0.41,1.75] | 0.10 | 0.22 |
| Others (Ref) | | | | |
| **Type of family** | | | | |
| Joint | -1.27 | [-2.64,0.08] | -0.20 | 0.06 |
| Nuclear(Ref) | | | | |
| **Socio economic status (SES)** | | | | |
| Class III | -0.67 | [-2.84,1.12] | -0.09 | 0.46 |
| Class IV | -0.42 | [-2.30,1.46] | -0.05 | 0.66 |
| Class V | -1.55 | [-3.38,0.28] | -0.27 | 0.09 |
| Class I or II (Ref) | | | | |
| **Have BPL Card** | | | | |
| No | 0.55 | [-0.40,1.51] | 0.09 | 0.25 |
| Yes (Ref) | | | | |
| **Type of Delivery** | | | | |
| Others | -0.65 | [-1.63,0.33] | -0.11 | 0.19 |
| Normal( Ref) | | | | |

| **Comorbidity** | | | | |
|---|---|---|---|---|
| None | 0.75 | [-1.06,2.57] | 0.07 | 0.41 |
| Anemia | 1.22 | [-0.29,2.73] | 0.13 | 0.11 |
| Other (Ref) | | | | |
| **Intervention Group** | **Unstandardized Coefficients** | **95.0% Confidence Interval** | **Standardized Coefficients (Beta)** | **Significant** |
| **Religion** | | | | |
| Hindu | 0.96 | [-0.40,2.32] | 0.12 | 0.16 |
| Muslim (Ref) | | | | |
| **Age** | | | | |
| 21-25 years | -0.97 | [-1.87,0.06] | -0.22 | 0.03* |
| $\geq$ 26 years | -0.25 | [-1.43,0.92] | -0.04 | 0.67 |
| $\leq$ 20 years (Ref) | | | | |
| **Mother's Education** | | | | |
| Primary / Secondary | -0.68 | [-2.21,0.84] | -0.14 | 0.37 |
| Higher Secondary | -0.68 | [-2.18,0.81] | -0.15 | 0.36 |
| PUC or Graduate | -0.61 | [-2.63,1.40] | -0.08 | 0.54 |
| Illiterate (Ref) | | | | |
| **Occupation of Mother** | | | | |
| Unemployed | 0.26 | [-0.88,1.41] | 0.04 | 0.65 |
| Others (Ref) | | | | |
| **Type of family** | | | | |
| Joint | 0.40 | [-0.66,1.47] | 0.08 | 0.45 |
| Nuclear(Ref) | | | | |
| **Socio economic status (SES)** | | | | |
| Class III | -1.13 | [-2.56,0.29] | -0.15 | 0.11 |
| Class IV | -0.34 | [-1.55,0.87] | -0.06 | 0.58 |
| Class V | -0.31 | [-1.39,0.77] | -0.07 | 0.57 |
| Class I or II (Ref) | | | | |
| **Have BPL Card** | | | | |
| No | -0.25 | [-1.03,0.53] | -0.05 | 0.53 |
| Yes (Ref) | | | | |

| | | | | |
|---|---|---|---|---|
| **Age at menarche** | | | | |
| ≤ 12 years | 0.133 | [0.66,0.92] | 0.02 | 0.74 |
| ≥ 13 years (Ref) | | | | |
| **Type of Delivery** | | | | |
| Others | 0.98 | [-0.30,2.27] | 0.13 | 0.13 |
| Normal( Ref) | | | | |
| **Parity** | | | | |
| Multi | 0.994 | [0.22,1.75] | 0.22 | 0.01* |
| Primi (Ref) | | | | |
| **Comorbidity** | | | | |
| None | -0.03 | [-0.82,0.75] | -0.06 | 0.93 |
| Anemia | 0.36 | [-1.04,1.78] | -0.04 | 0.609 |
| Other (Ref) | | | | |
| **p value < 0.05 statistically significant* | | | | |

In intervention group, women aged 21 to 25 years scored 0.97 points lower in practice scores compared to those aged 20 or younger. Additionally, multiparous women scored, on average, 0.99 points higher than primiparous women.

# DISCUSSION

Postnatal care refers to the support and medical care given to mothers and newborns after delivery. It includes monitoring maternal health, preventing complications, supporting breastfeeding and ensuring the baby's well-being and immunizations. Community education would play a key role in improving postnatal care in the area with limited resources. Our study was conducted among 312 rural mothers living in the Vantamuri region which is a rural field practice area under The Department of Community Medicine, J. N. Medical College, KAHER, Belagavi, Karnataka from April 2023 to March 2024.

## Socio-Demographic Characteristics (Tables 1 – 9)

In this study, the majority of participants were in the 21-25 age group, with 50.0% in intervention group and 37.2% in control group. A smaller proportion of participants were over 30 years old in both groups. Regarding the education of the mother, 37.2% of control group and 46.2% of intervention group had completed higher education. As for mothers' employment status, 75.6% of control group and 84.6% of intervention group were unemployed. 16.0% of the husbands in control group and 21.2% in intervention group were illiterate. Most participants identified as Hindus, with 84.0% in control group and 91.7% in intervention group, while 16.0% of control group and 8.3% of intervention group were Muslims. Around two-thirds of the participants belonged to nuclear families, while one-third were from joint families. Most participants were in socio-economic class five, with 55.8% in control group and 53.8% in intervention group, followed by class four, with 15.4% in control group and 17.9%

in intervention group. These findings align with a comparable study carried out by *Chaudhary K et al.* in Nepal.[23]

**Menstrual History (Tables 10-11)**

Most of the participants attained menarche and had their first menses between 13 to 14 years in both groups. Nearly 67.3% in control and 74.4% in intervention had regular periods between 21 to 45 days. These findings were similar in a study.[23]

**Obstetric History (Tables 12-13)**

Our study highlights a difference in types of delivery between control and intervention groups. In control group, 61.5% of participants had spontaneous vaginal deliveries, while 13.5% underwent emergency cesareans and 25% had elective cesareans. In contrast, intervention group demonstrated a notably higher percentage of spontaneous vaginal deliveries, with 90.4% of participants experiencing this type of delivery. 83.3% of the control group reported no comorbidities but intervention group had a high prevalence of anemia at 47.4%. Other comorbidities like gestational diabetes and hypertension were relatively low in both groups. A study done by *Anuradha Singh, et al.* in Delhi showed 71.5% of participants had vaginal deliveries and 28.5% had cesarean sections, while the study observed a high prevalence of anemia [70.4%] which is high compared to our study.[20]

**KAP regarding Postnatal care among the participants (Tables 14-42)**

**I) Postnatal visit and Danger sign**

In our study intervention group showed better awareness regarding ideal postnatal visits than the control group. Among the intervention group [35.9%] correctly identified the ideal visits (4 visits). A comparable finding was seen in a study steered by *Safa H. Alkalash, et al* in Egypt and *Teslim Akinsola Sanusi, et al.* in Nigeria showed most participants had better knowledge regarding postnatal visits.[45,46]

In present study, [99.4%] of the intervention group were aware while the control group [91.7%] were unaware of postnatal care, [82.4% vs 48.7%] were aware of postnatal danger signs. Intervention group demonstrated a greater understanding of postnatal danger signs, such as fever, difficulty in breathing, abdominal pain, and seizures in relation to control group. A study in Nepal and Southern Ethiopia revealed that postnatal mothers were able to recognize maternal danger signs, which aligns with our study findings.[47,48]

In our study, a larger proportion of participants in intervention group attended the postnatal visit, with 49.4% of them attending for four visits, compared to control group. A Punjab study by *Alison M. El Ayadi, et al.* showed around 50% of the participants attended postpartum visits within six weeks of delivery[OR 2.88, 95% CI 1.07-7.74].[49]

**II) Breastfeeding**

In present study intervention group had higher knowledge regarding colostrum against control group [92.9% vs 71.8%] and around [10.9% vs 3.8%] believed that pre-lacteal feeding is good for newborns. Intervention group demonstrated better knowledge about breastfeeding initiation, with approximately 89.1% choosing to breastfeed during the first hour post-delivery, compared to 61.5% in control group, [92.3% vs 40.4%] were aware of exclusive breastfeeding, [57.1% vs 38.5%] had knowledge regarding initiation of supplementary food at 6 months, [96.2% vs 41.0%] knew that breast milk can be given during illness. A study in Dakshina Kanada District showed 97% of mothers seem to have better knowledge about colostrum and 80% were knowing the benefits of exclusive breastfeeding which aligns with our study result. A study in Bangalore by *Maheshwari L, et al.* showed the pretest knowledge level regarding breastfeeding [50%] and weaning practice [25%]. In the post-test knowledge regarding breastfeeding practice was [62.5%] and weaning practice [37%] which is concordant with our study.[50,51]

The intervention group demonstrated greater awareness regarding breastfeeding on demand [84.0%], burping after each feed [74.4%] and exclusive breast milk until 6 months [64.7%]. More participants in intervention group recognized that breastfeeding helps prevent diseases [66.0%] and strengthens emotional bonding [78.2%]. Noida study showed 35.2% had a positive attitude that breastfeeding helps in bonding between mother and the newborn.[52] A study in Mangalore and Uttarakhand showed a higher percentage of mothers had good knowledge regarding burping after each feed and breastfeeding will increase attachment between mother and child which is concordant with our study.[50,53]

In our study [75.6% vs 7.1%] of the intervention group believed that their child did not require pre-lacteal feedings, compared to control group. Regarding benefits of breastfeeding, [67.9% vs 6.4%] recognized its advantages for mother and newborn. The intervention group also had a much higher belief that breast milk alone is sufficient for a baby's growth until 6 months [87.2% vs. 14.7%] and felt that breastfed babies are healthier than formula-fed babies [92.3% vs. 25.6%]. Additionally, [94.9% vs 12.8%] expressed confidence in breastfeeding.

In Tamil Nadu, study done by *Subbarayan Sarojini, et al*. found majority [96%] of the respondents had a positive attitude toward breastfeeding. Additionally, 52% of them believed formula feeding was healthier, which was higher than what we observed in our study.[54] *Pramodha M.S., et al.* study showed positive attitudes of the mothers towards breastfeeding, 95% of participants agreed that breastfeeding was more beneficial than formula feeding which aligns with our study.[50]

In the present study, 90.4% of the intervention group gave colostrum to their baby, compared to 76.3% in control group. Similar studies done in New Delhi, Mangalore, Chennai and Bijapur showed majority of the participant gave colostrum to their newborns which is concordant with our study.[20,50,54,55] On the contrary, studies done by *Rishima Nahata, et al.* and *Mallikarjun C. Yadavannavar, et al* showed higher percentage of mothers discarding the colostrum.[52,56]

In our study [82.1% vs 32.1%] intervention group versus the control group fed newborns on demand, burping after every feed was practiced by [75.0% vs 60.3%], woke their baby at night for feeding [75.0% vs 40.4%]. A study by *Anuradha Singh, et al*. in Delhi showed around higher percentage of people were feeding their newborns

on demand and regularly burping their babies after each feed which is concordant with our study.[20]

**III) Newborn care**

In the present study, the intervention group exhibited higher knowledge of newborn care and immunization against the control group. [96.8% vs 33.3%] heard of newborn care, [91.7% vs 59.0%] understood the benefits of maternal attachment, Awareness of keeping the room warm [67.3% vs 38.5%], [75.6% vs 25.0%] recognized the need to delay bathing. A study by *Saha, et al.* in the village of Tongi in Gazipur district and by *Yisak, et al.* in Ethiopia found that most participants had a strong understanding of maternal attachment, the importance of delayed bathing and keeping baby warm, with findings that were similar to the present study.[57,58]

Participants in our study had better knowledge regarding vaccination among intervention versus control group [95.5% vs 36.5%] and [97.4% vs 57.1%] were aware of vaccination benefits. A study in Bangalore by *Nandhini, et al* showed 77% of mothers had awareness of immunization with findings aligning with our study.[59]

In present study, intervention group exhibited a more positive attitude towards newborn care and immunization against the control group regarding keeping baby warm, changing diapers regularly, covering the baby with warm clothing and awareness of vaccine-preventable diseases. Furthermore, [49.4% vs 24.4%] agreed on the need for regular diaper changes, [78.8% vs 13.5%] of them believed covering the baby's head and feet was essential, regarding vaccinations [82.7% vs 9.6%] recognized their role in preventing infections. A study with similar findings done in Tamilnadu by *Parvathy*

*Devi, et al* and another study done in Bhopal urban slum by *Tiwari A., et al* showed the majority of the mothers have a positive attitude regarding immunization.[60,61]

Our study showed higher practices in intervention group compared to control group such as [77.6% vs 17.3%] avoiding bathing the newborn immediately after birth, [86.5% vs 22.4] keeping newborn warm by holding them against themselves, wrapping the newborn in warm clothing more frequently [78.8% vs. 23.1%] and maintaining a warm room [88.5% vs. 30.8%], diaper usage [88.5% vs 44.2%]. A study in Uttar Pradesh done by *Niveditha Devasenapathy, et al* showed mother practices adequate thermal care for babies, delayed bathing and proper perineal hygiene which aligns with our study findings.[62] A study conducted in Uttar Pradesh by *Pankaj K. Pathak, et al.* found most mothers gave their babies first bath on the fourth day after birth [39.5%], followed by the fifth day [27.5%] and half of the mother practiced wrapping the newborn to maintain the temperature.[63] A study conducted in Pakistan showed most of the participants bathed their newborns after 24 hours and once a week. This practice is based on the belief that early bathing can immediately cleanse and purify the baby. Nevertheless, findings of our study were contradictory.[64]

**IV) Personal Hygiene and Nutrition**

In the present study, 87.8% of intervention group recognised the importance of washing hands before and after handling the baby compared to control group [58.3%], [37.2% vs 10.3%]. Awareness of postnatal exercises and yoga, [85.9% vs 31.4] and [98.7% vs 47.4%] of participants understood the importance of adequate rest and avoiding heavy lifting postpartum. Study done by *Revati Kharate, et al.* showed majority of the participants [61%] had knowledge regarding postpartum exercise which aligns with our study findings.[65]

Our study showed higher knowledge about iron supplementation during the postnatal period among intervention group. A similar study done in Bharatpur, Rajasthan showed good knowledge [60.4%] regarding Iron and folic acid supplement during postpartum period which is concordant with our study.[66]

In the present study 85.9% of the intervention group understood the importance of washing hands before and after handling the baby, compared to 21.8% in control group, [66.0% vs 8.3%] believed postnatal exercise aids recovery. A study in Tamilnadu by *Vishnu G Ashok, et al.* showed 52% of positive attitudes towards postpartum exercise which is concordant with our study.[67]

In present study majority of intervention group reported washing their hands before and after handling the newborn [91.0% vs. 35.9%] in contrast to control group. [40.4% vs 8.3%] engaged in postnatal exercise. [92.9% vs 16.7%] of intervention group reported taking adequate rest. Findings from other similar studies that align with our study.[65,66,67,68,69]

**V) Family Planning**

In the present study knowledge regarding methods of contraception was higher in interventional group than in control group [ 82.6 % vs 12.8%]. A study in Rajasthan by *Jyoti Khyalia, et al.* showed 50% of participants had good knowledge regarding contraceptive methods and the mean score for knowledge about contraceptive methods during postpartum was 6.43 $\pm$ 0.71.[70] A similar study by *Tilahun Wodaynew, et al.* in South West Ethiopia found that around 65.7% was having good knowledge about contraceptive methods, aligning with our study findings.[71]

In our study among the control group, 87.8% were unaware of effective contraceptive methods while in the intervention group, 82.1% recognized breastfeeding as a feasible option with only 9.6% referring to pills. A study in Nepal by *Sarita Shrestha, et al.* showed higher percentage of participants were aware of condoms, pills and injectables as effective contraceptive methods but in our study, low awareness is noted regarding pills and injectables.[72] A similar study done in Ethiopia showed more participants knew pills as an effective contraceptive.[71]

In our study 80.8% of the control group was unaware of ideal birth spacing and 76.3% of intervention group identified two years as ideal birth spacing highlighting the intervention's effectiveness. 42.9% of the intervention group knew that oral contraceptive pills (OCP) could be used after delivery, compared to control group 2.6%, knowledge about the availability of pills at government hospitals was [61.55% vs 3.2%]. Study done in Ethiopia showed that 42.5% of participants preferred injectables, 23.6% chose pills as a suitable postpartum contraception and the majority (67.9%) were concerned about potential side effects which corresponds with our study finding.[71]

In the present study around 77.6% of the intervention group have used some contraception compared to control group 13.5%. In the control group, most participants do not use contraception because of insufficient knowledge regarding its use, willingness to become pregnant, and other factors. Study done by *Yusuf Abisowo Oshodi, et al*. found the common reasons for not using family planning which include fear of side effects, desire for more children, husband opposition, lack of knowledge, religious reasons, limited access, and cultural beliefs.[73] A study conducted at AIIMS New Delhi found that participants were not using contraceptive methods due to reasons such as unwillingness to use any method (18%), misconceptions about contraception (6.3%), and practicing abstinence (37.5%), which aligns with our study's findings regarding unawareness of contraception.[74]

**Comparison of knowledge, attitude and practice scores between control and intervention groups regarding Postnatal Care (Table 43-48)**

The present study evaluated the normality of Knowledge scores using the Kolmogorov-Smirnov test, which showed a normal distribution in both the control and intervention groups ($p > 0.05$). Results revealed a significant difference, with intervention group achieving notably higher mean scores than the control group [$27.08 \pm 6.46$ vs $39.25 \pm 3.93$].

In present study, the normality of attitude and practice was tested using the Kolmogorov-Smirnov test revealed that the scores were not normally distributed in either the control or intervention group ($p < 0.05$). Results showed intervention group exhibited a higher mean rank [80.91 vs 232.09] and medians [11 vs 19] reflecting significantly better attitude scores compared to control group. In practice scores the intervention group showed higher mean ranks [87.33 vs 225.67] and medians [8 vs 15] suggesting better practice scores than the control group.

**Correlation analysis between knowledge, attitude and practice of the control group and intervention group (Table 49)**

In the control group, statistically significant weak positive correlations were found between Knowledge and Attitude (0.171), Knowledge and Practice (0.266) and Attitude and Practice (0.192) which shows that improved attitudes showed a connection with better practice. Among intervention group, no significant correlations were found which showed that knowledge, attitude and practice have increased independently but did not show any correlation between the variables.

**Factors influencing knowledge, attitude and practice among control and intervention groups regarding postnatal care (Tables 50-52)**

In this study, factors influencing knowledge in control group showed that participants with a PUC or graduation degree scored, on average, 5.19 units higher in knowledge, while women without comorbidities scored an average of 5.33 units higher, both of which were statistically significant. In intervention group, individuals from SES class IV scored, on average, 2.47 points lower in knowledge compared to those from SES classes I or II. Additionally, women whose age at menarche was before 12 years had an average knowledge score 1.46 points higher than those who began puberty at age 13 or older. Women with Cesarean section scored lower in knowledge compared to those who had a normal delivery. Regarding attitude, our study found that women in intervention group without comorbidities achieved an average score that was 0.87 points higher, which was statistically significant. None of the variables showed significant associations in the control group with respect to attitude. In terms of practice, women aged 21 to 25 years in intervention group scored 0.97 points lower on practice scores, while multiparous women scored an average of 0.99 points lower in practice.

A study in North West Ethiopia by *Kihinetu Gelaye Wudineh, et al* . showed maternal educational [secondary school and above] (AOR = 3.29, 95%CI: 1.94–5.57), SES class V (AOR = 2.85, 95%CI: 1.21–6.68).[75] A study done across various geographical regions in India showed women with higher education (AOR: 1.57, 95% CI 1.49–1.65) compared to uneducated women were positively associated with postnatal care which is concordant with our study.[76]

# CONCLUSION

Postnatal care (PNC) plays a crucial role in ensuring health and well-being of the mother and the newborn. This period is critical for preventing complications and addressing any health issues that may arise. The importance of PNC lies in its capacity to reduce maternal and neonatal mortality rates by providing timely medical interventions, promoting breastfeeding and offering guidance on newborn care, personal hygiene and family planning.

Health education regarding PNC is important, especially in rural regions where healthcare access is constrained. Inadequate postnatal care is still a challenge in several parts of the world, contributing to preventable deaths. Strengthening PNC services is essential for improving maternal and child health outcomes globally.

This study can provide reference point for future research and multicentric research involving a larger sample size can be planned.

# RECOMMENDATIONS

According to the results of our study, the following recommendations are suggested.

- Establish a well-organized awareness regarding postnatal care for new mothers that includes postnatal visits, danger signs, breastfeeding, newborn care, personal hygiene, nutrition and family planning. These initiatives should be customized to address the rural communities and delivered in user-friendly formats, using mobile application, community workshops, roleplays, skits and outreach activity.

- In depth interview and focus group discussion with mothers, key decision-makers in the household, community representatives and health care providers would give more insight into customs and beliefs on postnatal care which help in creating an intervention to adopt positive PNC practices in community.

- Create peer groups of mothers who have gone through the positive postnatal care experiences to serve as inspiring role models for others

- Postnatal care also involves participation of husband and family members in educating to create a supportive environment, encouraging their active participation in ensuring proper healthcare to the mother.

- Frequent monitoring and evaluation of national programs should be conducted to assess their effectiveness and adaptability based on community input and evolving best practices in health concerning mothers and their children.

# STRENGTHS

1. A well-designed and structured intervention that helped to improve rural mothers understanding of postnatal care, breastfeeding, newborn care, personal hygiene and family planning.
2. This study fills an important gap by offering effective strategies for enhancing postnatal care awareness, especially in communities with limited maternal healthcare knowledge.
3. The findings provide valuable insights for policymakers and health educators aiming to improve maternal health practices making this study a significant contribution to maternal health research.

# LIMITATIONS

1. In this study language barriers, cultural beliefs, socioeconomic factors and access to resources may be one of the limitations.

2. Health education can provide valuable knowledge, but turning that knowledge into behavior change is difficult due to factors like habits, social norms and lack of motivation.

# SUMMARY

The postnatal period, extending up to six weeks after childbirth, is vital for both mothers and newborns, influencing their health and survival. However, it often lacks adequate care, contributing to high maternal and neonatal death, particularly within the first month. Essential postnatal care involves addressing complications like excessive bleeding, poor breastfeeding, and recognizing danger signs, alongside proper newborn care, breastfeeding and immunizations. Postnatal care supports maternal recovery through nutrition, exercise, contraception and programs like HBNC, immunization and postpartum family planning for improved health outcomes.

This interventional study, conducted at the Rural Primary Health Centre Vantamuri in Belagavi, aimed to evaluate impact of health education on knowledge, attitudes and practices regarding postnatal care among rural women. The study included 312 participants, divided into a control group (postnatal mothers) and an intervention group (antenatal mothers). Systematic random sampling was used to select participants and health education was delivered to the intervention group through PowerPoint presentations, handouts and videos (latching technique, newborn care and recognizing danger signs).

Data on sociodemographic factors, obstetric history, and postnatal care practices were collected using a structured questionnaire. The results showed that the intervention group exhibited improvements in knowledge, attitudes and practices compared to the control group. The intervention group demonstrated a better understanding of postnatal care practices, including the importance of follow-up visits, breastfeeding, personal hygiene and the identification of danger signs.

The study suggests the importance of continuous health education and collaboration with community health workers to ensure better maternal and child health outcomes. Future interventions should be tailored to the needs of diverse populations, integrating cultural considerations and utilizing continuous monitoring and feedback mechanisms to improve postnatal care practice in rural communities.

# BIBLIOGRAPHY

1. WHO recommendations on maternal and newborn care for a positive postnatal experience (2022) Who.int. World Health Organization. Available at: https://iris.who.int/bitstream/handle/10665/352658/9789240045989-eng.pdf

2. International Institute for Population Sciences. National Family Health Survey (NFHS-5) 2019-21. Volume 1.
   Available from: https://dhsprogram.com/pubs/pdf/FR375/FR375.pdf

3. Park K. Park's Textbook of Preventive and Social Medicine. 27th Ed., Jabalpur, India: Bhanot; 2023.

4. Guidance Note on Optimizing Postnatal care. Available from: https://nhm.hp.gov.in/storage/app/media/uploaded-files/guidance%20note.pdf

5. Anemia Mukt Bharat-Operational Guidelines Operational Guidelines for Programme Managers Intensified National Iron Plus Initiative (I-Nipi) Ministry of Health and Family Welfare Government of India. 2018. https://www.nhm.gov.in/images/pdf/Nutrition/AMB-guidelines/Anemia-Mukt-Bharat-Operational-Guidelines-FINAL.pdf

6. Gertosio, C., Meazza, C., Pagani, S., & Bozzola, M. (2016). Breastfeeding and its gamut of benefits. Minerva pediatrica, 68 3, 201-12. Available from: https://www.minervamedica.it/en/journals/minerva-pediatrics/article.php?cod=R15Y2016N03A0201

7. Chepkirui D, Nzinga J, Jemutai J, Tsofa B, Jones C, Mwangome M. A scoping review of breastfeeding peer support models applied in hospital settings. Vol. 15,

International Breastfeeding Journal. BioMed Central Ltd; 2020 Available from: http://dx.doi.org/10.1186/s13006-020-00331-7

8. UNICEF. Breastfeeding. UNICEF DATA. 2022. Available from: https://data.unicef.org/topic/nutrition/breastfeeding

9. Artal, Raul MD. Exercise in Pregnancy: Guidelines. Clinical Obstetrics and Gynecology 59(3):p 639-644, September 2016. DOI: https://10.1097/GRF.0000000000000223

10. Zakarija-Grkovic, I. and Stewart, F. (2020) "Treatments for breast engorgement during lactation," Cochrane database of systematic reviews, 9(9), p. CD006946. Available at: https://doi.org/10.1002/14651858.CD006946.pub4

11. Ayele, A.D. et al. (2022) "Knowledge and practice of essential newborn care and associated factors among women in Ethiopia: systematic review and meta-analysis," Reproductive health, 19(1), p. 172. Available at: https://doi.org/10.1186/s12978-022-01480-0

12. Ministry Of Health and Family Welfare Ministry of Women and Child Development Mother and Child Protection Card. Available from: https://nhm.gov.in/New_Updates_2018/NHM_Components/Immunization/Guidelines_for_immunization/MCP_Card_English_version.pdf card

13. Ministry of Health and Family Welfare Government of India Home Based Newborn Care (HBNC) Strengthening of Health and Nutrition through Home Visits 2018. Available from: https://nhm.gov.in/New_Updates_2018/NNW/Posters/HBYC_Posters-English.pdf

14. Know Your child's Immunization Schedule. Unicef.org. 2022. Available from: https://www.unicef.org/india/know-your-childs-immunization-schedule

15. Wassihun, B. et al. (2021) "Prevalence of postpartum family planning utilization and associated factors among postpartum mothers in Arba Minch town, South Ethiopia," Contraception and reproductive medicine, 6(1), p. 6. Available at: https://doi.org/10.1186/s40834-021-00150-z

16. United Nations. Transforming our world: The 2030 agenda for sustainable development. United Nations.2015.
Available from: https://sdgs.un.org/2030agenda

17. Shrestha, T., Bhattarai, S.G. and Silwal, K. (2013) "Knowledge and practice of postnatal mother in newborn care," JNMA; journal of the Nepal Medical Association, 52(190), pp. 372–377. Available at: https://pubmed.ncbi.nlm.nih.gov/24362663/

18. Knowledge on Postnatal Care Among Postnatal Mothers Sandhya Timilsina, Rojana Dhakal21B.sc Nursing Scholar, School of Health and Allied Sciences. Pokhara University, Lekhnath; Nepal. Available at https://saudijournals.com/media/articles/SJMPS_1487-92.pdf

19. Training Manual on Care During Pregnancy and Child Birth for Community Health Officer at Ayushman Bharat-Health and Wellness Centres. Available from:https://nhsrcindia.org/sites/default/files/2021-12/Care%20During%20Pregnancy%20and%20Childbirth%20Training%20Manual%20for%20CHO%20at%20AB-HWC.pdf

20. Singh A, Gs T, Jindal N, Yadav D, Biswas S. Original Research the Awareness and Practices of Postnatal Care in Mothers Delivered at A Tertiary Care Centre: A Hospital-Based Study. Available at: https://doi.org/10.37557/gjphm.v6i1.234

21. Selvaraj R, Ramakrishnan J, Sahu S kumar, kar SS, Roy G. Community-based assessment of postnatal care in Puducherry—A cross-sectional study. J Family Med Prim Care. 2021 Feb;10(2):798–803 Available at: https://10.4103/jfmpc.jfmpc_1083_20

22. Sacks E, Finlayson K, Brizuela V, Crossland N, Ziegler D, Sauvé C, et al. Factors that influence uptake of routine postnatal care: Findings on women's perspectives from a qualitative evidence synthesis. PLoS One. 2022 Aug 1;17(8 August). Available at: 10.1371/journal.pone.0270264

23. Chaudhary K, Nepal J, Shrestha K, Karmacharya M, Khadka D, Shrestha A, et al. Effect of a social media-based health education program on postnatal care (PNC) knowledge among pregnant women using smartphones in Dhulikhel hospital: A randomized controlled trial. PLoS One. 2023 Jan 1;18(1 January). Available at: https://10.1371/journal.pone.0280622

24. Adhikari Associate Professor I, Bhandari M. Knowledge of Postnatal Danger Signs and Associated Factors among Mothers in Nepal. Available from: www.ijfmr.com

25. Nabugwere RS, Mbalinda SN, Ayebare E. Knowledge of postnatal danger signs and associated factors among first-time mothers at Tororo General Hospital, Uganda. Afr J Midwifery Womens Health. 2022 Oct 2;16(4):1–9. DOI: https://doi.org/10.12968/ajmw.2021.0057

26. Bashir A, Mansoor S, Naikoo M. Knowledge, attitude, and practices of postnatal mothers regarding breastfeeding: A cross-sectional study. Int J Med Sci Public Health. 2018;7(11):725. DOI: https://10.5455/ijmsph.2018.0309301062018

27. Rishima Nahata, Vikramjeet Singh Bhadouria. Knowledge, Attitudes, and Practices (KAP) of breastfeeding in developing nations- how far have we come? International Journal of Frontiers in Medicine and Surgery Research. 2023 Jul 30;3(2):009–14. DOI: https://doi.org/10.53294/ijfmsr.2023.3.2.0066

28. Sultania P, Agrawal NR, Rani A, Dharel D, Charles R, Dudani R. Breastfeeding knowledge and behavior among women visiting a tertiary care center in India: A cross-sectional survey. Ann Glob Health. 2019;85(1). DOI: https://10.5334/aogh.2093

29. Narahari K, Venumadhav S, Kumar SS, Reddy MS. Descriptive cross-sectional study on rate of early breastfeeding initiation among mothers delivered at tertiary care maternity centers. International Journal of Academic Medicine and Pharmacy. Available from: www.academicmed.org

30. Jelly P, Kodi M, Sharma M, Sharma SK, Sharma R. Knowledge, preferences, practices, and attitudes about breastfeeding among postnatal mothers in Uttarakhand, India: a cross-sectional study. Indian J Community Health. 2022 Jun 30;34(2):294–300. DOI: https://doi.org/10.47203/IJCH.2022.v34i02.027

31. Pathak PK, Singh JV, Agarwal M, Kant S. Postnatal newborn care practices and knowledge of newborn danger signs among mothers in rural area of Lucknow, Uttar Pradesh. J Family Med Prim Care. 2021 Jan;10(1):300–6. DOI: https://10.4103/jfmpc.jfmpc_1603_20

32. Yogesh M, Bhavana BM, Padhiyar N, Gandhi R, Misra S. Identifying gaps in maternal knowledge and care-seeking for neonatal health: A mixed methods study in rural pregnant women. J Educ Health Promot. 2024 May;13(1). DOI: https://10.4103/jehp.jehp_66_24

33. Dangol A, Shrestha R, Bhandari B, Yakha M, Pandey S. Knowledge and Practice Regarding Newborn Care among Postnatal Mother in Selected Community, Bhaktapur. 2023; Available from: www.phdcentre.edu.np

34. Hazarika M, Baishya D. A Study to Assess the Knowledge and Practice on Newborn Care Among Postnatal Mothers at a Selected Hospital Golaghat District, Assam. International Journal of Science and Healthcare Research. 2022 Dec 7;7(4):180–5. DOI: https://doi.org/10.52403/ijshr.20221025

35. R Takale Samir, R AN, M KK. A Cross-Sectional Descriptive Study to Assess Awareness about Childhood Immunization amongst Pregnant Women Residing in Field Practice Area of a Primary Health Center in Maharashtra. Scholars Journal of Applied Medical Sciences. 2021 Apr 15;9(4):558–62. DOI: https://10.36347/sjams.2021.v09i04.014

36. Tiwari A., Vishwakarma K. A study of knowledge, attitude and practice of mothers on immunization of children in urban slums. Int J Pediatr Res.2019;6(10): 547-554.DOI: https://10.17511/ijpr.2019.i10.09

37. GebreEyesus FA, Tarekegn TT, Amlak BT, Shiferaw BZ, Emeria MS, Geleta OT, et al. Knowledge, Attitude, and Practices of Parents About Immunization of Infants and Its Associated Factors in Wadla Woreda, North East Ethiopia, 2019.

Pediatric Health Med Ther. 2021 May;Volume 12:223–38. DOI: https://10.2147/phmt.s295378

38. Nayak and Jain: Family planning KAP among postnatal women DOI: https://doi.org/10.1016/s0029-7844

39. Pal R, Maheshwari S, Kaka N, Patel N, Sethi Y. Knowledge, Attitude and Practices of Postpartum Females Regarding the Acceptance of Immediate Postpartum Contraception: A Cross-Sectional Study from North India. Cureus. 2022 Oct 2; DOI: 10.7759/cureus.29824

40. Kashyap P, Prasad S. Assessing the Knowledge, Attitude and Practice of Contraception in Semi-urban Area in India: A Qualitative Assessment of Contraceptive Usage. International Journal of Medical Research & Health Sciences. 2018;7(10):150–4. Available from: www.ijmrhs.com

41. Belgaum becomes Belagavi, as Centre clears name change plan [Internet]. The Indian Express. 2014. https://indianexpress.com/article/india/india-others/centre-clears-name-change-plan-belgaum-is-now-belagavi/

42. Belagavi | India, City, & History | Britannica. Available from: https://www.britannica.com/place/Belagavi

43. K J, A., Mishra, A. & Borle, A.L. Updated B. G. Prasad Scale for Socioeconomic Status Classification for the Year 2024. Indian J Pediatrics 91, 643 (2024). https://doi.org/10.1007/s12098-024-05131-

44. Konar, H. (2023) DC Dutta's Textbook of Obstetrics: Including Perinatology & Contraception. 10th ed. New Delhi, India: Jaypee Brothers Medical.

45. Alkalash S, El kelany O, Zayed H. Knowledge, attitude, and practice regarding postpartum care among mothers attending an Egyptian family health unit. Menoufia Med J. 2022;35(2):528. Available from: http://dx.doi.org/10.4103/mmj.mmj_238_21

46. Sanusi TA, Abdus-Salam RA, Oladokun A. Attitude of postpartum women towards multiple postnatal clinic schedule in south-west Nigeria. Eur J Obstet Gynecol Reprod Biol X. 2023;18(100197):100197. Available from: http://dx.doi.org/10.1016/j.eurox.2023.100197

47. Beraki GG, Tesfamariam EH, Gebremichael A, Yohannes B, Haile K, Tewelde S, et al. Knowledge on postnatal care among postpartum mothers during discharge in maternity hospitals in Asmara: a cross-sectional study. BMC Pregnancy Childbirth. 2020;20(1). Available from: http://dx.doi.org/10.1186/s12884-019-2694-8

48. Dangura AD. Knowledge about child birth and postpartum obstetric danger signs and associated factors among mothers in Dale district, Southern Ethiopia. BMC Pregnancy Childbirth. 2020;20(1). Available from: http://dx.doi.org/10.1186/s12884-020-02989-7

49. Ayadi AME, Diamond-Smith NG, Duggal M, Singh P, Sharma P, Kaur J, et al. Preliminary impact of an mHealth education and social support intervention on maternal health knowledge and outcomes among postpartum mothers in Punjab, India. Research Square. 2023. Available from: http://dx.doi.org/10.21203/rs.3.rs-3746241/v1

50. M. P, Pitty N, Chaitra. Knowledge, attitudes and practices of breast feeding among lactating mothers in a tertiary care hospital in Dakshina Kannada district: a cross-sectional survey. Int J Reprod Contracept Obstet Gynecol. 2020;9(8):3119. Available from: http://dx.doi.org/10.18203/2320-1770.ijrcog20203290

51. Maheshwari, Mary A. S, Dabashini Devi L. A study to assess the effectiveness of structured teaching programme on knowledge and attitude regarding breastfeeding and weaning practices among post-natal mothers in channasandra urban, Bangalore city. Asian J Nurs Educ Res. 2023;130–4. Available from: http://dx.doi.org/10.52711/2349-2996.2023.00028

52. Nahata R, Bhadouria VS. Knowledge, Attitudes, and Practices (KAP) of breastfeeding in developing nations- how far have we come? Int J Front Med Surg Res.2023;3(2):009–14.
Available from: http://dx.doi.org/10.53294/ijfmsr.2023.3.2.0066

53. Mundhra R, Kumar R. A cross-sectional study of knowledge, attitude, and practice toward breastfeeding among postnatal mothers delivering at a tertiary care center in Garhwal, India. Int J Appl Basic Med Res. 2021;11(2):64. Available from: http://dx.doi.org/10.4103/ijabmr.ijabmr_605_20

54. Sarojini S, Kesudeen M, Saranya S, Maikandan CJ, Srinivasan J. Knowledge, attitude, and practice of breastfeeding among south Indians: A cross-sectional study. J Prim Care Spec. 2024;5(3):151–6. Available from: http://dx.doi.org/10.4103/jopcs.jopcs_10_24

55. Mallesh V, Patil SS, Sorganvi V. Maternal understanding and practices of breastfeeding and infant feeding in rural North Karnataka: a cross-sectional study. Int J Community Med Public Health. 2023;11(1):134–9. Available from: http://dx.doi.org/10.18203/2394-6040.ijcmph20234116

56. Infant feeding practices: Barriers and benefits of breastfeeding practices among mothers in a village in north Karnataka. Indian J Public Health Res Dev. 2020; Available from: http://dx.doi.org/10.37506/ijphrd.v11i5.9317

57. Abhulimhen-Iyoha B, Ibadin M. Cord care education and its content given to mothers at antenatal clinics in various health facilities in Edo state, Nigeria. Sahel Med J. 2015;18(3):129. Available from: http://dx.doi.org/10.4103/1118-8561.169278

58. Yisak H, Ewunetei A. Postnatal mothers' knowledge, attitudes, and practices about newborn care at Debre Tabor Hospital, Ethiopia, 2019. PAMJ One Health. 2022;7. Available from: http://dx.doi.org/10.11604/pamj-oh.2022.7.17.25649

59. Indian journal of applied research. World Wide Journals; 2019. Available from: https://www.worldwidejournals.com/indian-journal-of-applied-research-(IJAR)/recent_issues_pdf/2021/April/knowledge-of-mothers-regarding-immunization_April_2021_2116792950_0801726.pdf

60. Devi P, Manohar S, Lavanya R, Pasupathy S. Knowledge, attitude and practices on childhood immunization among parents attending pediatric OPD at a tertiary care centre, Kanchipuram district, Tamil Nadu, India. Indian J Neonatal Med Res. 2022; DOI: https://10.7860/IJNMR/2022/57543.2359

61. Associate Professor, Department of Pediatrics R.K.D.F Medical College, Bhopal, MP, India, Tiwari DA, Vishwakarma DK, Assistant Professor, Department of Pediatrics R.K.D.F Medical College, Bhopal, MP, India. A study of knowledge, attitude and practice of mothers on immunization of children in urban slums. Pediatr Rev Int J Pediatr Res. 2019;6(10):547–54. Available from: http://dx.doi.org/10.17511/ijpr.2019.i10.09

62. Devasenapathy N, Neogi SB, Soundararajan S, Ahmad D, Hazra A, Ahmad J, et al. Association of antenatal care and place of delivery with newborn care practices: evidence from a cross-sectional survey in rural Uttar Pradesh, India. J Health Popul Nutr. 2017;36(1). Available from: http://dx.doi.org/10.1186/s41043-017-0107-z

63. Pathak PK, Singh JV, Agarwal M, Kant S. Postnatal newborn care practices and knowledge of newborn danger signs among mothers in rural area of Lucknow, Uttar Pradesh: A cross-sectional study. J Family Med Prim Care. 2021;10(1):300–6.
Available from: http://dx.doi.org/10.4103/jfmpc.jfmpc_1603_20

64. Dangol A, Shrestha R, Bhandari B, Yakha BM, Pandey S. Knowledge and Practice Regarding Newborn Care among Postnatal Mother in selected community, Bhaktapur. J Adv Acad Res. 2023;10(1):63–74. Available from: http://dx.doi.org/10.3126/jaar.v10i1.54619

65. Kharate R, Mehdiabadi DE, Jerome DA, St. Andrews College of Physiotherapy. To study the knowledge, attitude and practice of postpartum exercises in nursing mothers. International Journal of Scientific Research in Engineering and

Management. 2024;08(10):1–5. Available from: http://dx.doi.org/10.55041/ijsrem37966

66. Pokhrel A, Bhatta B, Adhikari A. Compliance to Iron Folic Acid Supplementation and its associated factors among post-partum mothers of Bharatpur Metropolitan. medRxiv. 2024. Available from: http://dx.doi.org/10.1101/2024.07.18.24310631

67. Mohamed A, G Ashok V. Knowledge, practice and attitude of postnatal mothers towards postnatal exercises in a rural area of Tamil Nadu. Indian J Forensic Community Med. 2019;6(3):134–7. Available from: http://dx.doi.org/10.18231/j.ijfcm.2019.031

68. Knowledge, attitude and practice among postnatal mothers regarding postnatal exercise in selected villages at pooncheri, Kanchipuram district, Tamilnadu, India. Med-Leg Update. 2020; Available from: http://dx.doi.org/10.37506/mlu.v20i2.1066

69. Swapna Kumari A, Lakshmi Prasanna M. Effectiveness of video assisted structured teaching programme on postnatal exercises in terms of knowledge attitude and practices among postnatal mothers at KIMS hospital, amalapuram. Int J Sci Res (Raipur). 2023;12(11):960–5. Available from: http://dx.doi.org/10.21275/sr231109153438.

70. Jyoti Khyalia, Yadav DK. IJSR - International Journal of Scientific Research. IJSR - International Journal of Scientific Research . 2023 Aug; Volume 12 Issue 8. Available from: https://www.worldwidejournals.com/international-journal-of-scientific-research-(IJSR)/article/assessment-of-the-knowledge-attitude-and-

practice-study-towards-family-planning-among-postpartum-women-in-tertiary-care-centre-in-bikaner-rajasthan-a-cross-sectional-study/NTE3MTY=/?is=1&b1=553&k=139

71. Wodaynew T, Bekele D (2021) Assessment of Knowledge, Attitude and Practice of Contraceptive Use among Postpartum Women in Jimma University Medical Center, Jimma Town, South West Ethiopia. Int J Womens Health Wellness 7:130. Available from: https://10.23937/2474-1353/1510130

72. Shrestha S, Poudel R, Napit J. Awareness and practice on postpartum family planning among postpartum mothers attending on maternal and child health clinic. J Coll Med Sci-Nepal. 2020;16(2):88–92. Available from: http://dx.doi.org/10.3126/jcmsn.v16i2.28143

73. Oshodi YA, Olaniyi MO, Akinlusi FM, Ottun TA, Chionuma JO, Adegoke SA. Perception and practice of family planning in the extended postpartum period. GSC Adv Res Rev. 2022;13(3):148–61. Available from: http://dx.doi.org/10.30574/gscarr.2022.13.3.0363

74. Murry L, Dabas S, Thuileiphy T, Kumari V, Gudiya G, Joshi P. Knowledge, attitude and utilization of family planning methods among postpartum women in A selected tertiary care facility in India. Journal of midwifery and reproductive health.2021;9:2597–604.Availablefrom: https://jmrh.mums.ac.ir/article_17212_164a65f6c22c3b7a1ada07945a215354.pdf

75. Wudineh KG, Nigusie AA, Gesese SS, Tesu AA, Beyene FY. Postnatal care service utilization and associated factors among women who gave birth in

Debretabour town, North West Ethiopia: a community- based cross-sectional study. BMC Pregnancy Childbirth. 2018;18. Available from: http://dx.doi.org/10.1186/s12884-018-2138-x

76. Paul P. Geographical variations in postnatal care use and associated factors in India: evidence from a cross-sectional national survey. GeoJournal. 2022;87(1):21–34. Available from: http://dx.doi.org/10.1007/s10708-020-10241-0

77. Cloherty and Starks Manual of Neonatal Care (2021). Available from: https://www.udocz.com/apuntes/748170/cloherty-and-starks-manual-of-neonatal-care

78. Sampathkumar S, Sankar M, Ramasamy S, Sriram N, Saravanan P, Ram U. Uptake, engagement and acceptance, barriers and facilitators of a text messaging intervention for postnatal care of mother and child in India—A mixed methods feasibility study. Int J Environ Res Public Health. 2022;19(15):8914. Available from: http://dx.doi.org/10.3390/ijerph19158914

79. Das B. Study on postnatal care in a tertiary care hospital in eastern India and the reality. Int J Community Med Public Health. 2020;7(10):3917. Available from: http://dx.doi.org/10.18203/2394-6040.ijcmph20204354

80. Gadhavi K, Pandit N, Pankaj N. Barriers and enablers of postnatal care by accredited social health activist (ASHA) workers: A community-based qualitative study from tribal Gujarat. Cureus. 2024; Available from: http://dx.doi.org/10.7759/cureus.56667

81. Sacks E, Finlayson K, Brizuela V, Crossland N, Ziegler D, Sauvé C, et al. Factors that influence uptake of routine postnatal care: Findings on women's perspectives from a qualitative evidence synthesis. PLoS One. 2022;17(8):e0270264. Available from: http://dx.doi.org/10.1371/journal.pone.0270264

82. Wojcieszek AM, Bonet M, Portela A, Althabe F, Bahl R, Chowdhary N, et al. WHO recommendations on maternal and newborn care for a positive postnatal experience: strengthening the maternal and newborn care continuum. BMJ Glob Health. 2023;8(Suppl 2):e010992. Available from: http://dx.doi.org/10.1136/bmjgh-2022-010992

83. Fadel SA, Ram U, Morris SK, Begum R, Shet A, Jotkar R, et al. Facility delivery, postnatal care and neonatal deaths in India: Nationally-representative case-control studies. PLoS One. 2015;10(10):e0140448. Available from: http://dx.doi.org/10.1371/journal.pone.0140448

84. Balasubramaniam S, Kumar S, Sethi R, Charurat E, Lalchandani K, Schuster A, et al. Quasi-experimental study of systematic screening for family planning services among postpartum women attending village health and nutrition days in Jharkhand, India. Int J Integr Care. 2018;18(1). Available from: http://dx.doi.org/10.5334/ijic.3078

85. ACOG Committee Opinion no736: Optimizing postpartum care.Obstet Gynecol 2018;131(5):e140–50. Available from: http://dx.doi.org/10.1097/aog.0000000000002633

# ANNEXURE – I

# INFORMED CONSENT FORM

## "EFFECT OF HEALTH EDUCATION ON KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING POSTNATAL CARE AMONG RURAL WOMEN – AN INTERVENTIONAL STUDY"

**Introduction:**

You are invited to participate in the study to find out "Effect of Health Education on Knowledge, Attitude and Practices regarding Postnatal Care among Rural Women - An Interventional Study". The postnatal period starts right after the baby's birth and extends for six weeks (42 days). During this time, both maternal and neonatal mortality and morbidity rates are significantly high. Postnatal care is crucial for the well-being of both the mother and the newborn. However, there are several gaps in knowledge, attitudes and practices related to postnatal care. Providing health education can help address these gaps effectively. As a result, this study aims to improve the knowledge, attitudes and practices regarding postnatal care among rural pregnant mothers. This is the purpose of undertaking the current study. Participation in this study is completely voluntary.

**Explanation of procedures:**

In this study, you must answer a few prepared questions about socio-demographic details, Basic knowledge, attitude and practice questions about postnatal visits, postnatal danger signs, breastfeeding, immunization, nutrition, personal hygiene, contraception and family planning. Questions will only be asked if you agree to participate and you have the option to withdraw from the study at any time.

**Withdrawal from participation in the study:** Participation in this study is voluntary. You will be free to decide whether to participate in this study or continue participation once enrolled. In case you decide to withdraw your participation, you are free to do so. However, please convey the decision to the principal investigator.

**Possible benefits from participation in the study:** You will get to know the practices of postnatal care by participating in this study. The data gathered will help the large population.

**Possible risks from participation in the study:** There are no risks involved in this study.

**Privacy and Confidentiality**: The information collected from you will be coded, to prevent any person from identifying you. Your identity will never be revealed. The data collected from you will be kept confidential and only processed or aggregated data will be used for publication.

**Financial incentives:** You will not receive any payment for participating in this study. The cost of investigation done during the course of the study will be paid by the principal investigator/Participant.

**Authorization for publication of aggregated data:** Results obtained after processing of the aggregated data will be published for scientific purposes and or presented to scientific groups. However, your identity will never be revealed.

**Legal rights:** By signing this consent form, we are not waving any of your legal rights

# CONSENT STATEMENT

I am making a voluntary decision to participate in the study **"Effect of Health Education on Knowledge, Attitude and Practice Regarding Postnatal Care Among Rural Women – An Interventional Study".** My signature below indicates that I have decided to participate and I have read the information provided above or the information provided above has been read to me in the language that I understand best. I was given the opportunity to ask questions and they were answered to my satisfaction.

Name of the Participant:

Signature or Left Thumb Impression of the Participant:

Name of the Witness:

Signature or Left Thumb Impression of the Witness:

Name of the Investigator:

Signature of the Investigator:

Date:

Place:

# ANNEXURE – II

# QUESTIONNAIRE

## "EFFECT OF HEALTH EDUCATION ON KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING POSTNATAL CARE AMONG RURAL PREGNANT WOMEN - AN INTERVENTIONAL STUDY"

### PART I: DEMOGRAPHIC AND PERSONAL DATA

1. Name: Mrs. _____
2. Age _____ years
3. Religion
   1) Hindu 2) Christian 3) Muslim 4) Jain 5) Sikh 6) Other_____
4. Education status of mother
   1) Illiterate 2) Primary School (1-4$^{th}$ std) 3) Secondary (5-7$^{th}$ std) 4) Higher Secondary (8-10$^{th}$ std) 5) PUC 6) Graduate 7) Postgraduate /Ph.D.
5. Education status of father
   1) Illiterate 2) Primary School (1-4$^{th}$ std) 3) Secondary (5-7$^{th}$ std) 4) Higher Secondary (8-10$^{th}$ std) 5) PUC 6) Graduate 7) Postgraduate /Ph.D.
6. Occupation of mother
   1) Unemployed 2) Unskilled worker 3) Semi-skilled worker 4) Skilled worker
7. Occupation of father
   1) Unemployed 2) Unskilled worker 3) Semi-skilled worker 4) Skilled worker
8. Type of Family
   1) Nuclear 2) Joint 3) Three-generation family
9. Total Family income per month Rs. _____
10. No. of Family members at home _____
11. Per capita income: Rs. _____
12. Socioeconomic status (Modified BG Prasad Classification)
    1) Class I 2) Class II 3) Class III 4) Class IV 5) Class V
13. Do you have a BPL card?
    1) Yes 2) No

### OBSTETRICS HISTORY

14. Age at menarche: _____years
15. Regularity of menstrual cycle 1) Regular 2) Irregular
16. Duration of bleeding during menses _____Days

17. Frequency of menstrual cycle _____Days
18. Age at marriage: _____years
19. Obstetric score * P__ L__ A__ MTP__ SB__
20. Type of Delivery
    1) Spontaneous Vaginal delivery 2) Assisted Vaginal delivery
    3) Emergency Cesarean Section 4) Elective Cesarean section
21. Any Co morbidity during this pregnancy:
    1) Anemia 2) Gestational Diabetes Mellitus (GDM 3) Pregnancy-induced Hypertension (PIH)
    4) GDM+ PIH 5) Other, specify _____

**Part II**

**KNOWLEDGE QUESTIONNAIRE**

**I) Postnatal Visits and Postnatal Danger signs**

22. How many ideal postnatal care visits are required?
    1) 4 2) 3 3) 2 4) 1 5) Don't know
23. Have you heard of Postnatal care Practices?
    1) Yes 2) No
24. If yes, where are you heard before? (Check that all apply)
    - Healthcare workers
    - Mass Media (Mobile, TV, Newspaper)
    - Internet
    - Advertisement
    - Parents/Family/Relatives
    - Others _____
25. Are you aware of postnatal danger signs?
    1) Yes 2) No
26. If yes, tick the following danger signs that you have heard. (Check all that apply)
    - Fever
    - Severe lower abdominal pain
    - Discharge from Vagina
    - Foul smelling Lochia
    - Excessive vaginal bleeding
    - Inability to control urine/ defecation
    - Excessive headache
    - Blurred Vision
    - Fits/ Seizures
    - Difficulty in Breastfeeding

27. Where will you go if any danger signs are present?

    1) Local clinic / Doctor 2) Primary health center 3) CHC/Taluk Hospital 4) Tertiary level hospital

**II Breast Feeding**

28. Is colostrum essential for newborns?

    1) Yes 2) No

29. Is Prelacteal feed is good for newborns?

    1) Yes 2) No

30. When you must initiate breastfeeding after delivery?

    1) <1h 2)1h to 2 h 3) >2 h

31. Have you heard about Exclusive breastfeeding (EBF)?

    1) Yes 2) No

32. If yes, how long should you practice?

    1) 3 months 2) 4 months 3) 5 months 4) 6 months

33. During sick can you give Breast milk?

    1) Yes 2) No 3) No idea

34. Should breastfeeding be given on demand?

    1) Yes 2) No 3) No idea

35. Can burping be done after each feed?

    1) Yes 2) No 3) No idea

36. When to start supplementary feeding?

    1) >3 months 2) > 6 months 3) >1yr

37. Whether water can be given to the baby during EBF?

    1) Yes 2) No 3) No idea

38. Whether breast milk alone is sufficient for a baby till 6 months?

    1) Yes 2) No 3) No idea

39. Does breastfeeding can prevent diseases affecting the breast?

    1) Yes 2) No 3) No idea

40. Whether giving breast milk help in bonding between mother and child?

    1) Yes 2) No 3) No idea

41. Do you know what are Signs of good attachment while lactation?

    1) Yes 2) No

42. If yes, tick what you know about signs of good attachment.

    - Chin touching the breast
    - Mouth wide open
    - Lower lip turned outward
    - More areola visible above the mouth of the newborn

43. Is breast engorgement one of the factors of poor attachment of the breast during lactation?

    1) Yes 2) No 3) No idea

**III Newborn care and Immunization**

44. Have you heard of newborn care?

    1) Yes  2) No

45. If yes, tick the newborn care you know

    - Keeping newborn warm
    - Eyecare
    - Umbilical care
    - Newborn bath/ cleaning
    - Immunization

46. Is keeping the baby warm by wrapping is good?

    1) Yes  2) No  3) No idea

47. Is keeping the baby attached to the mother good?

    1) Yes  2) No

48. Keeping the room warm is good?

    1) Yes  2) No

49. Do you know the delay in bathing the baby is good?

    1) Yes  2) No

50. Do you know that cleaning the stump of the baby is good?

    1) Yes  2) No

51. Does keeping the baby skin-to-skin contact help in maintaining the temperature?

    1) Yes  2) No

52. Is cleaning the eyes of the newborn necessary?

    1) Yes  2) No  3) No idea

53. Is cleaning the umbilical cord necessary?

    1) Yes  2) No  3) No idea

54. Are you aware of vaccines that are to be given immediately after birth for the newborn?

    1) Yes  2) No

55. Do you know the danger signs of newborns?

    1) Yes  2) No

56. If yes, tick what danger signs have you heard. (Check all that apply)

    - Fever
    - Chest indrawing
    - Inability to suck
    - Lethargy
    - Abdominal distension
    - Hypothermia
    - Eye infection
    - Cord infection
    - Convulsion
    - Vomiting

- Diarrhea
- Jaundice

57. Is vaccination beneficial for preventing disease in infants?

    1) Yes 2) No

58. Do you know birth registration for the baby in the local panchayat is mandatory?

    1) Yes 2) No

**IV Personal Hygiene and Nutrition**

59. Is washing hands before and after handling the baby necessary?

    1) Yes 2) No

60. Whether have you heard of postnatal exercise and postnatal yoga?

    1) Yes 2) No

61. Is Iron supplementation to be taken during the postnatal period?

    1) Yes 2) No

62. If yes, for how many months to be taken?

    1) 3 months 2) 4 months 3) 6 months 4) 1 year

63. Do you know washing the perineum daily helps to decrease infection?

    1) Yes 2) No

64. Do you know that an increase in food and fluid intake is good?

    1) Yes 2) No

65. Tick, Iron rich source you know? (Check all that apply)

    - Green leafy vegetables
    - Whole grains
    - Cereals
    - Dry fruits, nuts
    - Meat
    - Jaggary

66. Tick, Protein rich food you know? (Check all that apply)

    - Panner
    - Milk and milk products
    - Combined grains, Nuts
    - Eggs

67. Tick, Calcium rich foods you know? (Check all that apply)

    - Milk and milk products
    - Sesame seeds
    - Almonds
    - Soya milk
    - Turnip
    - Eggs

68. Do you know adequate rest and avoiding lifting weights is good for postpartum mothers?

    1) Yes 2) No

**V Family Planning Measures**

69. What are the contraceptive methods you know?

    1) Pills 2) Intrauterine Devices 3) Female sterilization 4) Condom 5) Don't know

70. Whether you can use Oral Contraceptive Pills after Delivery?

    1) Yes 2) No 3) Don't know

71. Is Pills are supplied in Government Hospitals (PHC)

    1) Yes 2) No 3) Don't know

72. Which is the effective contraception after pregnancy?

    1) Breastfeeding 2) Pills 3) Copper T Implantation 4) Don't know

73. Do you know for how many years birth spacing is ideal?

    1) 2 2) 3 3) 4 4) 5 5) Don't know

74. Do you know when pills can be consumed during the postpartum period?

    1) Yes 2) No 3) Don't know

## PART III

## ATTITUDE QUESTIONNAIRE

**I)Postnatal Visits and Postnatal Danger sign**

75. Do you think four visits are required during the postpartum period?

    1) Yes 2) No 3) No idea

76. Do you think knowing the postnatal danger signs can reduce mortality?

    1) Yes 2) No 3) No idea

77. Do you think that a postnatal visit is necessary to improve the mother and child's health?

    1) Yes 2) No 3) No idea

**II Breast Feeding**

78. Do you believe newborn requires pre-lacteal feedings?

    1)Yes 2) No

79. Do you think that breastfeeding is good for the mother and newborn?

    1) Yes 2) No

80. Do you think breastfeeding should be continued at night also?

    1) Yes 2) No

81. Do you believe that breast milk alone is sufficient for the baby's growth till 6 months?

    1) Yes 2) No

82. Do you feel that breastfed babies are healthier than formula-fed babies?

    1) Yes 2) No

83. Do you think breastfeeding must be stopped after initiation of weaning?

    1) Yes 2) No

84. Do you think that breastfeeding affects your beauty?

    1) Yes 2) No

85. Did you experience any anxiety while breastfeeding?

    1) Yes 2) No

86. Do you feel formula feeding is more convenient than breast milk?

    1) Yes 2) No

87. Are you confident enough to express breast milk?

    1) Yes 2) No

**III Newborn care and Immunization**

88. Do you think warming newborns is necessary?

    1) Yes 2) No

89. Do you think cleaning the umbilical cord will reduce infection?

    1) Yes 2) No

90. Do you think that the diaper of the baby should be changed regularly?

    1) Yes 2) No

91. Do you think that the head and feet of the newborn should be covered to maintain the temperature?

    1) Yes 2) No

92. Do you think that cleaning the eye in newborns is necessary?

    1) Yes 2) No

93. Do you think vaccinating newborns will prevent infection?

    1) Yes 2) No

94. Do you think bathing is necessary immediately after birth?

    1) Yes 2) No

**IV Personal Hygiene and Nutrition**

95. Do you think washing your hands before and after handling the baby is necessary?

    1) Yes 2) No

96. Do you think restricting food during the postpartum period is good?

    1) Yes 2) No

97. Do you think that postnatal exercise helps in speed recovery?

    1) Yes 2) No

98. Do you think consuming iron tablets after delivery is beneficial?

    1) Yes 2) No

99. Do you think that washing the perineum reduces the risk of infection?

    1) Yes 2) No

100. Do you think lifting weight delays in healing surgical scars?

    1) Yes 2) No

**V Family Planning Measures**

101. Do you think that breastfeeding alone will help you in contraception?

    1) Yes 2) No 3) No idea

102. Do you feel taking OCP is a danger to infants?

    1) Yes 2) No 3) No idea

103.Do you think that taking OCP will reduce the secretion of breast milk?

1) Yes 2) No 3) No idea

104.Do you think Cu T is effective for contraception?

1) Yes 2) No

105.Do you think Cu T's administration is not good for future pregnancy?

1) Yes 2) No 3) No idea

106.Do you think Family planning has complications?

1) Yes 2) No

107.Have you ever discussed family planning methods with your husband?

1) Yes 2) No

**PART IV**

**PRACTICE QUESTIONNAIRE**

**I)Postnatal Visits and Postnatal Danger signs**

108.Did you attend any postnatal visits?

1) Yes 2) No

109.If yes, how many visits have you attended?

1) 2 2) 3 3) 4

**II Breast Feeding**

110.Did you give any pre-lacteal feeds to the baby?

1) Yes 2) No

111.Did you give colostrum to the baby?

1) Yes 2) No

112.At what time you initiated breastfeeding?

1) <1h 2) 1h-24h 3) 1 day- 5 days 4) > 5 days

113.Do you practice Exclusive breastfeeding?

1) Yes 2) No

114.Do you feed newborns on demand?

1) Yes 2) No

115. Did you practice burping in the newborn after every feed?

1) Yes 2) No

116. How many times do you feed your child at night?

1) Once 2) 2-3 times 3) more than 3 times

117.Do you wake up your baby at night for feeding?

1) Yes 2) No

118.Have you ever bottle-feeding for your baby?

1) Yes 2) No

**III Newborn care and Immunization**

119.Did you give a bath to a newborn immediately after birth?

1) Yes 2) No

120.Did you keep the baby warm by attaching it with you?

1) Yes 2) No

121.Did you wrap the newborn with warm clothes?

1) Yes 2) No

122.Did you keep your room warm?

1) Yes 2) No

123.With what material do you clean the umbilical cord?

1) Cotton 2) Oil 3) Cloth 4) No Cleaning

124.Whether you use diapers for babies?

1) Yes 2) No

125.Are you cleaning the perineum of the newborn after changing the diaper?

1) Yes 2) No

**IV Personal Hygiene and Nutrition**

126.Do you wash your hands before and after handling a newborn?

1) Yes 2) No

127.Have you ever done postnatal exercise?

1) Yes 2) No

128.How many liters of water you are consuming per day?

1) 4 - 6 2) 1 - 3

129.Are you taking adequate rest (8 hours of sleep and 2 hours during day time)?

1) Yes 2) No

**V Family Planning Measures**

130.Whether you have used any methods of contraception?

1) Yes 2) No

131.If yes, what is the reason to use contraceptives?

1) Birth spacing 2) Completed family 3) Economic problems 4) Improvement in health

132.If no, what is the reason not to use contraceptives?

1)Not sure how to use 2) Willing to be pregnant 3) Husband's Disapproval

4) Worried about the side effects 5) Religious 6) Others _____

133. Do you restrict having intercourse for 42 days post-pregnancy?

1) Yes 2) No

# ANNEXURE – III

# KEY TO MASTER CHART

## Part I: Demographic and Personal Data

1. Religion
   1 - Hindu
   2 - Christian
   3 - Muslim
   4 - Jain
   5 - Sikh
2. Education status of mother
   1 - Illiterate
   2 - Primary School (1-4$^{th}$ std)
   3 - Secondary (5-7$^{th}$ std)
   4 - Higher Secondary (8-10$^{th}$ std)
   5 - PUC
   6 - Graduate
   7 - Postgraduate /Ph.D.
3. Education status of father
   1 - Illiterate
   2 - Primary School (1-4$^{th}$ std)
   3 - Secondary (5-7$^{th}$ std)
   4 - Higher Secondary (8-10$^{th}$ std)
   5 - PUC
   6 - Graduate
   7 - Postgraduate /Ph.D.
4. Occupation of mother
   1 - Unemployed
   2 - Unskilled worker
   3 - Semi-skilled worker
   4 - Skilled worker
5. Occupation of father
   1 - Unemployed
   2 - Unskilled worker
   3 - Semi-skilled worker
   4 - Skilled worker
6. Type of Family
   1 - Nuclear
   2 - Joint

3 - Three generation family

4 - Broken family

7. Socioeconomic status (Modified BG Prasad Classification)

   1 - Class I

   2 - Class II

   3 - Class III

   4 - Class IV

   5 - Class V

8. Do you have a BPL card?

   1 - Yes

   2 - No

**OBSTETRICS HISTORY**

9. Regularity of menstrual cycle

   1 - Regular

   2 - Irregular

10. Type of Delivery

    1 - Spontaneous Vaginal delivery

    2 - Assisted Vaginal delivery

    3 - Emergency Cesarean Section

    4 - Elective Cesarean section

11. Any Co morbidity during this pregnancy:

    0 - None

    1 - Anemia

    2 - Gestational Diabetes Mellitus (GDM

    3 - Pregnancy induced Hypertension (PIH)

    4 - GDM+ PIH

    5 – Other

**KNOWLEDGE QUESTIONNAIRE**

**I)Postnatal Visits and Postnatal Danger signs**

12. How many ideal postnatal care visits are required?

    1 - 4 visits

    2 - 3 visits

    3 - 2 visits

    4 - 1 visit

    5 - Don’t know

13. Have you heard of Postnatal care Practices?

    1 - Yes

    2 – No

14. Are you aware of postnatal danger signs?
    1 - Yes
    2 - No
15. Where will you go if any danger signs are present?
    1 - Local clinic / Doctor
    2 - Primary health center
    3 - CHC/Taluk Hospital
    4 - Tertiary level Hospital

**II Breast Feeding**

16. Is colostrum essential for newborns?
    1 - Yes
    2 - No
17. Is Prelacteal feed good for newborns?
    1 - Yes
    2 – No
18. When you must initiate breastfeeding after delivery?
    1 - <1hr
    2 - 1hr to 2 hr
    3 - >2 hr
19. Have you heard about Exclusive breastfeeding (EBF)?
    1 - Yes
    2 - No
20. During sick can you give Breast milk?
    1 - Yes
    2 - No
    3 - No idea
21. Should breastfeeding be given on demand?
    1 - Yes
    2 - No
    3 - No idea
22. Can burping be done after each feed?
    1 - Yes
    2 - No
    3 - No idea
23. When to start supplementary feeding?
    1 - >3 months
    2 - > 6 months
    3 - >1yr

24. Whether water can be given to the baby during EBF?
    1 - Yes
    2 - No
    3 - No idea
25. Whether breast milk alone is sufficient for a baby till 6 months?
    1 - Yes
    2 - No
    3 - No idea
26. Does breastfeeding can prevent diseases affecting the breast?
    1 - Yes
    2 - No
    3 - No idea
27. Whether giving breast milk help in bonding between mother and child?
    1 - Yes
    2 - No
    3 - No idea
28. Do you know what are Signs of good attachment while lactation?
    1 - Yes
    2 - No
29. Is breast engorgement one of the factors of poor attachment of the breast during lactation?
    1 - Yes
    2 - No
    3 - No idea

**III Newborn care and Immunization**

30. Have you heard of newborn care?
    1 - Yes
    2 - No
31. Is keeping the baby warm by wrapping it good?
    1 -Yes
    2 - No
    3 - No idea
32. Is keeping the baby attached to the mother is good?
    1 - Yes
    2 - No
33. Keeping the room warm is good?
    1 - Yes
    2 - No
34. Do you know the delay in bathing the baby is good?
    1 - Yes
    2 - No

35. Do you know that cleaning the stump of the baby is good?

    1 - Yes

    2 - No

36. Does keeping the baby skin-to-skin contact help in maintaining the temperature?

    1 - Yes

    2 - No

37. Is cleaning the eyes of the newborn necessary?

    1 - Yes

    2 - No

    3 - No idea

38. Is cleaning the umbilical cord necessary?

    1 - Yes

    2 - No

    3 - No idea

39. Are you aware of vaccines that are to be given immediately after birth for the newborn?

    1 - Yes

    2 - No

40. Do you know the danger signs of newborns?

    1 - Yes

    2 - No

41. Is vaccination beneficial for preventing disease in infants?

    1 - Yes

    2 - No

42. Do you know birth registration for the baby in the local panchayat is mandatory?

    1 - Yes

    2 - No

**IV Personal Hygiene and Nutrition**

43. Is washing hands before and after handling the baby is necessary?

    1 - Yes

    2 - No

44. Whether have you heard of postnatal exercise and postnatal yoga?

    1 - Yes

    2 - No

45. Is Iron supplementation to be taken during the postnatal period?

    1 - Yes

    2 -No

46. If yes, for how many months to be taken?

    1 – 3 months

    2 - 4 months

    3 - 6 months

4 - 1 year

47. Do you know washing the perineum daily helps to decrease infection?

    1 - Yes

    2 - No

48. Do you know that an increase in food and fluid intake is good?

    1 - Yes

    2 - No

49. Do you know adequate rest and avoiding lifting weights is good for postpartum mothers?

    1 - Yes

    2 – No

**V Family Planning Measures**

50. What are the contraceptive methods you know?

    1 - Pills

    2 - Intrauterine Devices

    3 - Female sterilization

    4 - Condom

    5 - Don't know

51. Whether you can use Oral Contraceptive Pills after Delivery?

    1 - Yes

    2 - No

    3- Don't know

52. Is Pills are supplied in Government Hospitals (PHC)

    1 - Yes

    2 - No

    3 - Don't know

53. Which is the effective contraception after pregnancy?

    1 - Breastfeeding

    2 - Pills

    3 - Copper T Implantation

    4 - Don't know

54. Do you know for how many years birth spacing is ideal?

    1 - 2

    2 - 3

    3 - 4

    4 - 5

    5 - Don't know

55. Do you know when pills can be consumed during the postpartum period?

    1 - Yes

    2 - No

    3 - Don't know

## PART III

## ATTITUDE QUESTIONNAIRE

**I)Postnatal Visits and Postnatal Danger sign**

56. Do you think four visits are required during the postpartum period?
    1 - Yes
    2 - No
    3 - No idea
57. Do you think knowing the postnatal danger signs can reduce mortality?
    1 - Yes
    2 - No
    3 - No idea
58. Do you think that a postnatal visit is necessary to improve the mother and child's health?
    1 - Yes
    2 - No
    3 - No idea

**II Breast Feeding**

59. Do you believe newborn requires pre-lacteal feedings?
    1 - Yes
    2 - No
60. Do you think that breastfeeding is good for the mother and newborn?
    1 - Yes
    2 – No
61. Do you think breastfeeding should be continued at night also?
    1 - Yes
    2 - No
62. Do you believe that breast milk alone is sufficient for the baby's growth till 6 months?
    1 - Yes
    2 - No
63. Do you feel that breastfed babies are healthier than formula-fed babies?
    1 - Yes
    2 - No
64. Do you think breastfeeding must be stopped after initiation of weaning?
    1 - Yes
    2 - No
65. Do you think that breastfeeding affects your beauty?
    1 - Yes
    2 - No
66. Did you experience any anxiety while breastfeeding?
    1 - Yes
    2 - No

67. Do you feel formula feeding is more convenient than breast milk?

    1 - Yes

    2 - No

68. Are you confident enough to express breast milk?

    1 - Yes

    2 - No

**III Newborn care and Immunization**

69. Do you think warming a newborn is necessary?

    1 - Yes

    2 - No

70. Do you think cleaning the umbilical cord will reduce infection?

    1 - Yes

    2 - No

71. Do you think that the diaper of the baby should be changed regularly?

    1 - Yes

    2 - No

72. Do you think that the head and feet of the newborn should be covered to maintain the temperature?

    1 - Yes

    2 - No

73. Do you think that cleaning the eye in newborns is necessary?

    1 - Yes

    2 - No

74. Do you think vaccinating newborns will prevent infection?

    1 - Yes

    2 - No

75. Do you think bathing is necessary immediately after birth?

    1 - Yes

    2 - No

**IV Personal Hygiene and Nutrition**

76. Do you think washing your hands before and after handling the baby is necessary?

    1 - Yes

    2 - No

77. Do you think restricting food during the postpartum period is good?

    1 - Yes

    2 - No

78. Do you think that postnatal exercise helps in speed recovery?

    1 - Yes

    2 - No

79. Do you think consuming iron tablets after delivery is beneficial?

    1 - Yes

    2 - No

80. Do you think that washing the perineum reduces the risk of infection?

    1 - Yes

    2 - No

81. Do you think lifting weight delays in healing surgical scars?

    1 - Yes

    2 - No

**V Family Planning Measures**

82. Do you think that breastfeeding alone will help you in contraception?

    1 - Yes

    2 - No

    3 - No Idea

83. Do you feel taking OCP is a danger to infants?

    1 - Yes

    2 - No

    3 - No Idea

84. Do you think that taking OCP will reduce the secretion of breast milk?

    1 - Yes

    2 - No

    3 - No Idea

85. Do you think Cu T is effective for contraception?

    1 - Yes

    2 - No

86. Do you think Cu T's administration is not good for future pregnancy?

    1 - Yes

    2 - No

    3 - No Idea

87. Do you think Family planning has complications?

    1 - Yes

    2 - No

88. Have you ever discussed family planning methods with your husband?

    1 - Yes

    2 - No

**PRACTICE QUESTIONNAIRE**

**I)Postnatal Visits and Postnatal Danger signs**

89. Did you attend any postnatal visits?

    1 - Yes

    2 - No

90. If yes, how many visits have you attended?

    1 - 2

    2 - 3

    3 - 4

**II) Breast Feeding**

91. Did you give any pre-lacteal feeds to the baby?

    1 - Yes

    2 - No

92. Did you give colostrum to the baby?

    1 - Yes

    2 – No

93. At what time you initiated breastfeeding?

    1 - <1hr

    2 - 1hr-24hr

    3 - 1 day- 5 day

    4 - > 5 days

94. Do you practice Exclusive breastfeeding?

    1 - Yes

    2 – No

95. Do you feed newborns on demand?

    1 - Yes

    2 - No

96. Did you practice burping in the newborn after every feed?

    1 - Yes

    2 – No

97. How many times do you feed your child at night?

    1 - Once

    2 - 2-3 times

    3 - more than 3 times

98. Do you wake up your baby at night for feeding?

    1- Yes

    2 – No

99. Have you ever bottle-feeding for your baby?

    1 - Yes

    2 – No

**III Newborn care and Immunization**

100. Did you give a bath to a newborn immediately after birth?

1 - Yes

2 - No

101. Did you keep the baby warm by attaching it to you?

1 - Yes

2 - No

102. Did you wrap the newborn with warm clothes?

1 - Yes

2 - No

103. Did you keep your room warm?

1 - Yes

2 - No

104. With what material do you clean the umbilical cord?

1 - Cotton

2 - Oil

3 - Cloth

4 - No Cleaning

105. Whether you use diapers for babies?

1 - Yes

2 - No

106. Are you cleaning the perineum of the newborn after changing the diaper?

1 - Yes

2 - No

**IV Personal Hygiene and Nutrition**

107. Do you wash your hands before and after handling a newborn?

1 -Yes

2 – No

108. Have you ever done postnatal exercise?

1 - Yes

2 - No

109. How many liters of water you are consuming per day?

1 – (4 – 6 Lt)

2 – (1 – 3 Lt)

110. Are you taking adequate rest (8 hours of sleep and 2 hours during day time)?

1 - Yes

2 - No

**V Family Planning Measures**

111. Whether you have used any methods of contraception?

1 - Yes

2 - No

112. If yes, what is the reason to use contraceptives?

1 - Birth spacing

2 - Completed family

3 - Economic problems

4 - Improvement in health

113. If no, what is a reason not to use contraceptives?

1 - Not sure how to use

2 - Willing to be pregnant

3 - Husband's Disapproval

4 - Worried about the side effects

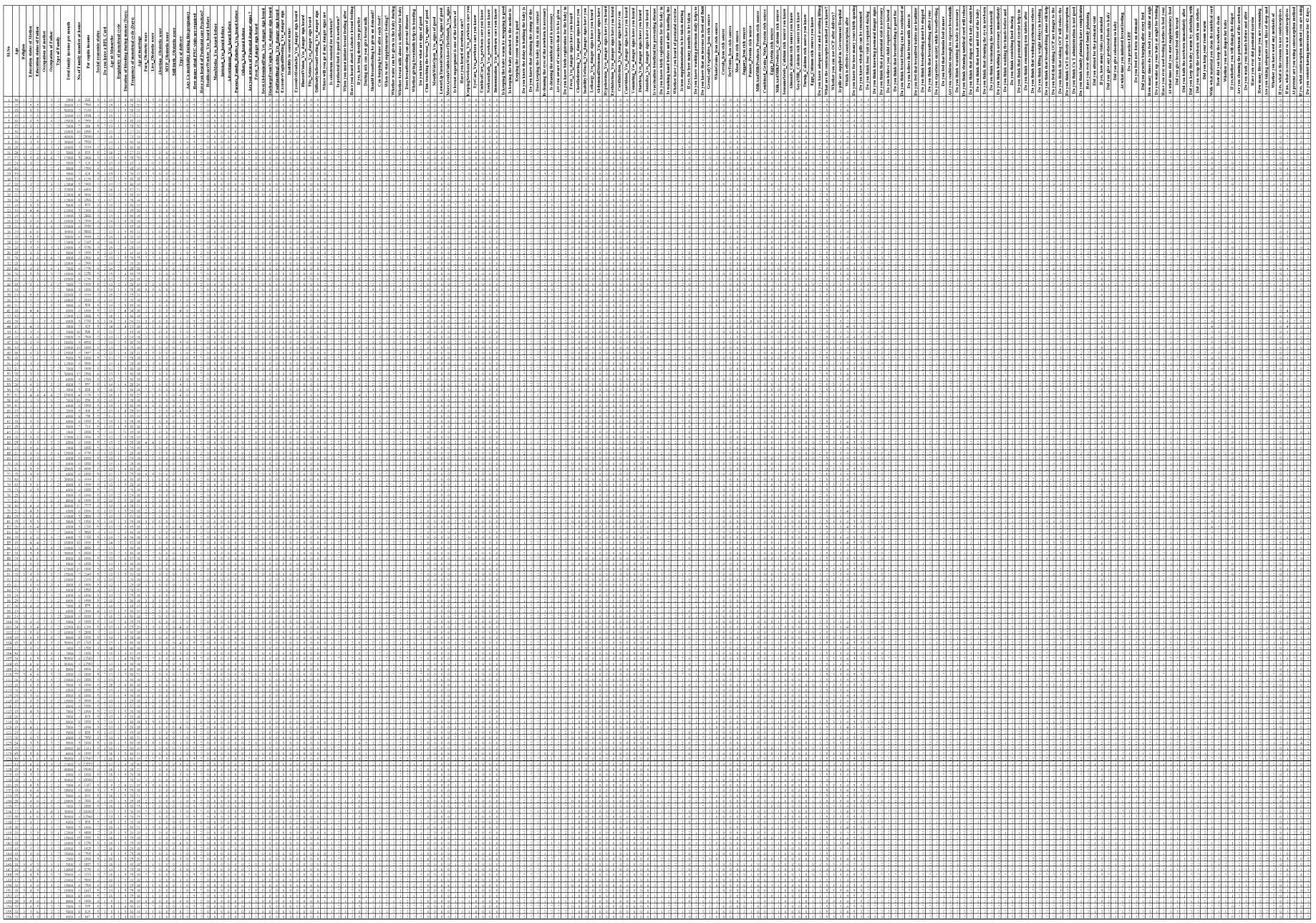
5 - Religious

114. Do you restrict having intercourse for 42 days post-pregnancy?

1 -Yes

2 - No

# Annexure IV - Control Group Master Chart



# Annexure IV - Intervention Group Master Chart