



A Study To Assess The Effect Of Bath After 24 Hours Of Birth On Body Temperature And Skin Flora Among Newborns Admitted In A Selected Hospital, Indore

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Abstract

Bathing practices for newborns vary across cultures, but evidence suggests that early bathing may adversely affect thermoregulation and disturb the natural protective skin flora. This study assessed the effect of bath given after 24 hours of birth on body temperature and skin flora among newborns admitted in a selected hospital in Indore. A quasi-experimental one-group pre-test post-test design was adopted among 100 healthy term newborns. Body temperature was measured using a digital axillary thermometer, and skin swabs were collected before and after the bath. Results revealed a statistically significant but clinically safe reduction in mean body temperature after the bath ($p < 0.05$) and mild, non-harmful changes in skin flora. Findings support WHO recommendations of delaying the first bath beyond 24 hours to promote thermoregulation and preserve beneficial skin flora. The study concludes that newborn bathing after 24 hours is safe and maintains physiological parameters within acceptable limits.

Keywords :- Newborn care, bathing after 24 hours, body temperature, skin flora, thermoregulation, neonatal health, vernix caseosa, newborn bathing practices, Indore, quasi-experimental study

Introduction

Bathing a newborn is one of the earliest caregiving activities performed by mothers or healthcare professionals. Traditionally, newborns in many Indian households are bathed within the first few hours after birth due to cultural and familial beliefs related to cleanliness, protection from evil influences, or the perception that bathing stimulates circulation and vitality. However, modern neonatal guidelines highlight that early bathing can predispose newborns to hypothermia, disturbance of vernix caseosa, and alteration of protective skin flora.

Newborn thermoregulation is inherently unstable due to the immature nervous system, thin skin, large body surface area-to-weight ratio, and limited subcutaneous fat. The World Health Organization (WHO) recommends delaying the first bath for at least 24 hours after birth to prevent temperature instability. Vernix caseosa, which is abundant on skin at birth, contains antimicrobial peptides, maintains hydration, and protects against infections. Early bathing removes this protective barrier and may alter the composition of skin flora, increasing susceptibility to hospital-acquired infections.

Several studies have shown that newborns bathed before 24 hours have significantly lower body temperatures and higher risk of hypothermia. Furthermore, colonization of skin by beneficial microorganisms such as *Staphylococcus epidermidis* acts as the first line of defense against pathogenic bacteria. Excessive or early bathing may disturb the normal microbial ecosystem, allowing colonization by harmful organisms including *Staphylococcus aureus* and *Klebsiella* species.

Despite global recommendations, practices vary in Indian hospitals. In many settings, newborns are bathed early due to cultural expectations or lack of awareness among caregivers. Evidence specific to the Indian context is limited, particularly regarding how bathing after 24 hours affects both thermoregulation and skin flora among admitted newborns.

Thus, this study aims to fill the research gap by evaluating the effect of newborn bathing after 24 hours on body temperature and skin flora among newborns admitted in a selected hospital in Indore. The findings will help guide nursing practice, support policy formulation, and educate mothers about safe newborn care.

Need of the Study

Newborn care practices during the immediate postpartum period play a pivotal role in ensuring optimal physiological stability and prevention of complications in early life. Bathing, although perceived as a routine and harmless activity, can significantly influence vital parameters, particularly thermoregulation and the integrity of skin flora. In many parts of India, including Indore, cultural norms and family traditions favor early bathing of newborns—often within the first few hours of birth. However, this practice contradicts evidence-based guidelines and may expose the newborn to avoidable risks.

Newborns, especially within the first 24 hours of life, are highly vulnerable to hypothermia due to immature thermoregulation, thin skin, and a high body surface area relative to weight. Hypothermia is one of the leading neonatal complications contributing to morbidity and mortality in low- and middle-income countries. According to WHO, delaying the first bath for at least 24 hours helps maintain body temperature and reduces the risk of hypothermia. Despite these recommendations, early bathing continues to be common in Indian hospitals, often due to lack of awareness among caregivers or institutional practices that have not been updated.

Another critical consideration is the newborn's skin flora. At birth, the skin is coated with vernix caseosa, which serves as a natural barrier with antimicrobial and moisturizing properties. Vernix supports colonization by beneficial microorganisms such as *Staphylococcus epidermidis*, which protect against pathogenic bacteria like *Staphylococcus aureus* and *Klebsiella* species. Early or frequent bathing can remove vernix prematurely, disturb microbial colonization, and potentially increase the risk of hospital-acquired infections. This is particularly relevant in neonatal units, where the risk of exposure to pathogens is higher.

Although global guidelines strongly advocate delayed bathing, there is limited region-specific research in Indian settings—especially in Madhya Pradesh—regarding the physiological effects of bathing after 24 hours on body temperature and skin flora. Local evidence is essential to influence practice, train nursing staff, and counsel mothers effectively. Hospitals must base newborn care protocols on scientific findings that reflect their patient demographics, environmental conditions, and cultural practices.

Moreover, nurses play a central role in newborn care, making it important to provide them with robust evidence for counselling mothers and standardizing clinical practices. Understanding how bathing after 24 hours affects newborn temperature stability and skin flora will empower healthcare providers to make informed decisions, reduce unnecessary risks, and promote safer newborn care.

Objectives

1. To assess the body temperature of newborns before and after bath given after 24 hours of birth.
2. To identify the skin flora before and after bath among newborns.
3. To compare pre-bath and post-bath measurements of body temperature and skin flora.
4. To find the association between selected demographic variables and post-bath body temperature and skin flora.

Hypotheses

- **H₁**: There will be a significant difference in body temperature before and after bath among newborns.
- **H₂**: There will be a significant difference in skin flora before and after bath among newborns.
- **H₃**: Selected demographic variables will show significant association with post-bath outcomes.

Materials and Methods

Research Approach

The study adopted an **evaluative research approach**, as it aimed to assess the effect of bathing after 24 hours of birth on body temperature and skin flora among newborns. This approach is suitable when the goal is to determine the effectiveness of an intervention on selected outcomes.

Research Design

A **quasi-experimental one-group pre-test post-test design** was used. In this design, measurements of body temperature and skin flora were taken before and after the intervention (bath after 24 hours), allowing comparison within the same group of newborns.

Setting

The study was conducted in the **neonatal unit of a selected tertiary care hospital in Indore, Madhya Pradesh**. The setting ensured access to healthy term newborns, controlled environmental conditions for bathing, and availability of microbiology facilities for skin flora assessment.

Sample

The sample consisted of **100 healthy term newborns** admitted in the neonatal unit who met the inclusion criteria.

Sampling Technique

A **purposive sampling technique** was used to select newborns who fulfilled the preset criteria and were clinically stable for participation in the study.

Inclusion Criteria

The study included newborns who met the following criteria:

- **Full-term newborns** (gestational age 37–42 weeks)
- **Aged more than 24 hours** at the time of first bath
- **Clinically stable**, without any congenital or medical complications
- **Birth weight ≥ 2.5 kg**
- Newborns whose **parents provided informed consent**
- Newborns admitted in the neonatal unit during the study period

Exclusion Criteria

Newborns were excluded from the study if they had:

- **Preterm birth** (gestational age < 37 weeks)
- **Low birth weight (< 2.5 kg)**
- **Any congenital anomalies** affecting skin, thermoregulation, or general health
- **Medical complications** such as respiratory distress, sepsis, hypothermia, or jaundice requiring phototherapy
- **Skin conditions** (dermatitis, infection, abrasions) that could alter skin flora
- **Newborns requiring intensive care** (NICU admission)
- **Newborns who received a bath before 24 hours**
- Parents who **did not give consent**

Tools and Techniques

1. **Digital Axillary Thermometer** – to measure body temperature.
2. **Sterile Skin Swab Kit** – to collect skin flora samples from the anterior chest.
3. **Demographic Proforma** – gestational age, birth weight, mode of delivery, etc.

Procedure

- Pre-bath (baseline): body temperature recorded; skin swab collected.
- Newborn was bathed using warm water in a controlled environment.
- Post-bath: body temperature and skin swab collected 30 minutes after bath.

Data Analysis

Data were analyzed using both **descriptive and inferential statistics**.

Descriptive Statistics

- Frequency and percentage were used to describe demographic variables.
- Mean and standard deviation (SD) were used to summarize body temperature and skin flora findings before and after the bath.

Inferential Statistics

- A **paired t-test** was applied to compare pre-bath and post-bath body temperature.
- A **chi-square test** was used to find associations between post-bath outcomes and selected demographic variables.

- A **p-value < 0.05** was considered statistically significant.

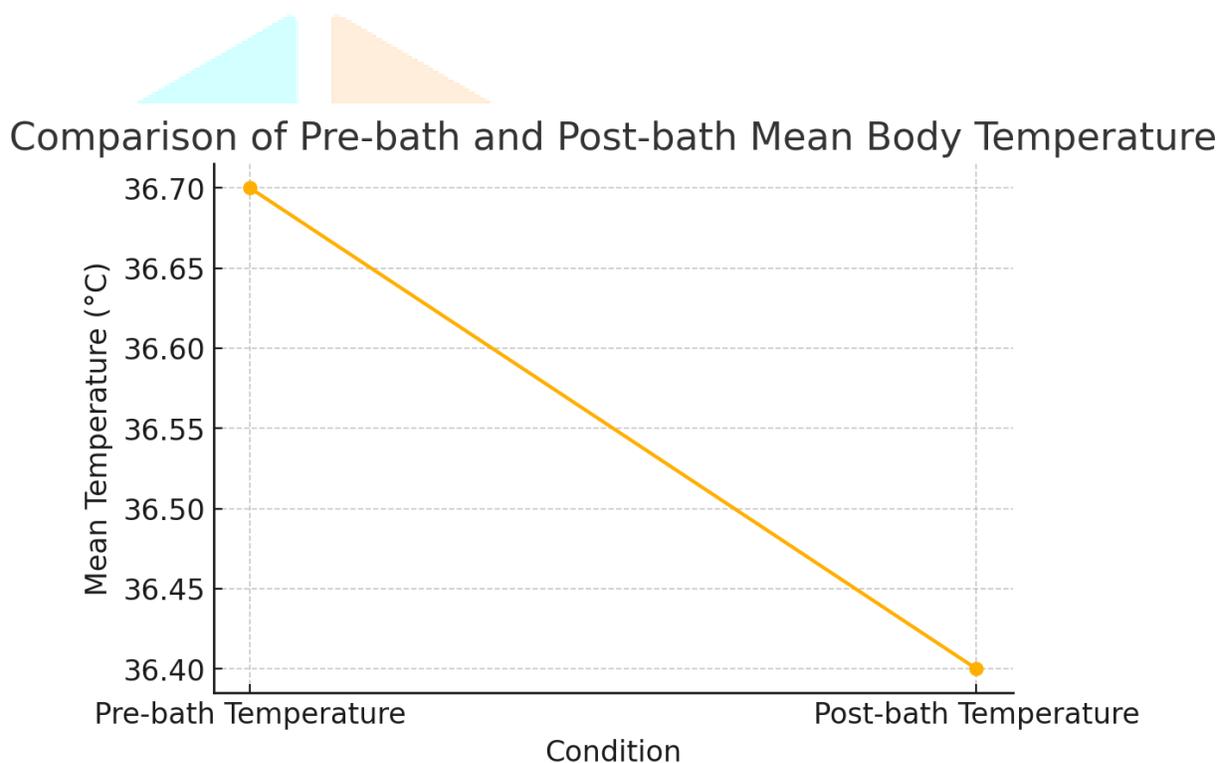
Results

Effect on Body Temperature

The analysis revealed the following changes in newborn body temperature before and after a bath given after 24 hours:

- **Mean pre-bath temperature:** $36.7^{\circ}\text{C} \pm 0.4$
- **Mean post-bath temperature:** $36.4^{\circ}\text{C} \pm 0.3$
- **Table 1: Comparison of Mean Body Temperature Before and After Bath (N = 100)**

Condition	Mean Temperature (°C)	Standard Deviation (SD)
Pre-bath Temperature	36.7	0.4
Post-bath Temperature	36.4	0.3



The **paired t-test** showed a **statistically significant difference (p < 0.05)** between pre-test and post-test temperatures.

However, the temperature remained **within the clinically acceptable neonatal range**, indicating that bathing after 24 hours does **not pose a risk of hypothermia** in healthy term newborns.

Effect on Skin Flora

In this study, skin flora analysis was conducted before and after the newborn’s first bath, which was given after 24 hours of birth. Skin swab samples were collected from the anterior chest area using sterile cotton swabs and cultured in the microbiology laboratory.

Pre-Bath Skin Flora Findings

Before the bath, the newborns showed colonization predominantly with **normal, beneficial skin flora**, which are essential for protecting the skin against pathogenic organisms. The most commonly identified microorganisms were:

- **Staphylococcus epidermidis**

A major component of healthy neonatal skin, known to play a protective role in preventing colonization by harmful bacteria.

- **Corynebacterium spp.**

Part of the natural commensal flora, contributing to maintaining skin pH and barrier integrity.

No pathogenic organisms were observed in the pre-bath cultures, indicating a healthy baseline microbial profile among the study participants.

Post-Bath Skin Flora Findings

Following the bath given after 24 hours, a second skin swab culture was conducted 30 minutes post-bath. The findings were as follows:

- **Slight reduction in normal flora count**

There was a mild decrease in colony-forming units (CFUs) of *Staphylococcus epidermidis* and *Corynebacterium*, which is expected after any cleansing procedure.

However, the reduction was **not significant enough** to compromise the protective microbial barrier.

- **No significant growth of pathogenic organisms**

Importantly, no new pathogenic organisms—such as *Staphylococcus aureus*, *Klebsiella*, *E. coli*, or *Pseudomonas*—were detected in post-bath cultures.

These findings show that bathing after 24 hours **does not disrupt the normal skin flora in a harmful way** and maintains the protective microbial balance.

Interpretation

The mild decrease in commensal flora is considered **physiologically normal** after bathing. Since no harmful bacteria were detected post-bath, the procedure is **safe and does not predispose newborns to infection**.

This supports WHO recommendations that bathing after 24 hours helps preserve vernix and healthy microbial colonization compared to early bathing (<24 hours).

Association Between Demographic Variables and Skin Flora

Demographic variables analyzed included:

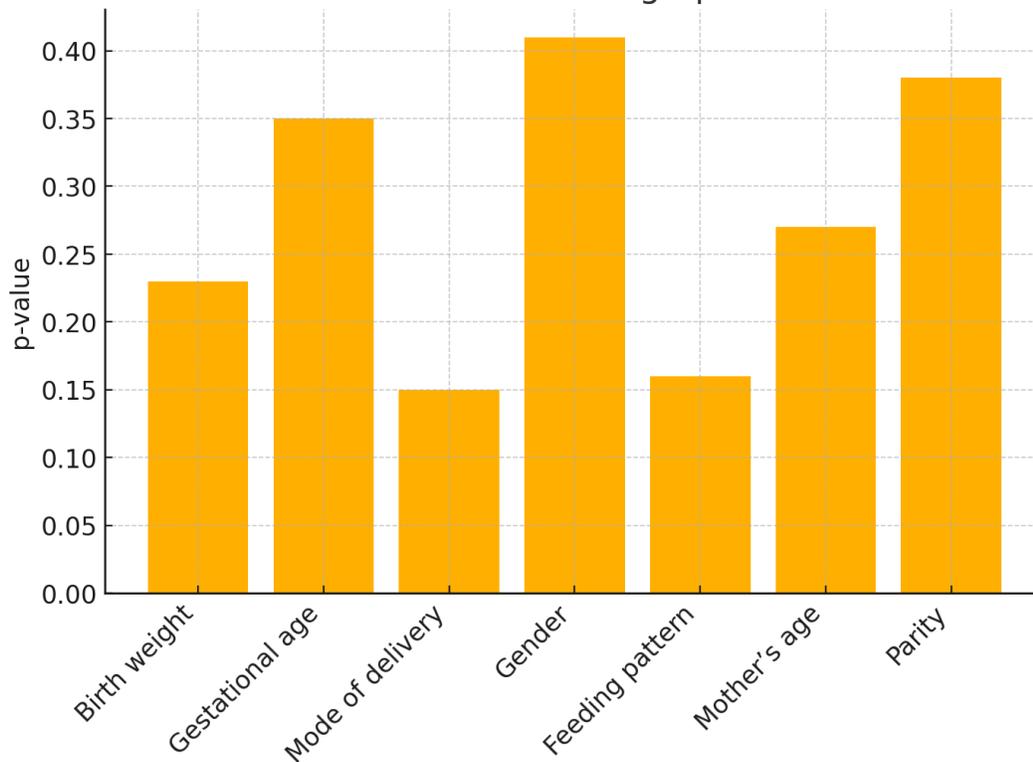
- Birth weight
- Gestational age
- Mode of delivery
- Gender
- Feeding pattern
- Mother's age
- Parity

Using the **chi-square test**, the study found that:

Table: Association Between Demographic Variables and Skin Flora (Chi-square Test Results)

Demographic Variable	Chi-square Value	p-value
Birth weight	1.42	0.23
Gestational age	0.87	0.35
Mode of delivery	2.11	0.15
Gender	0.65	0.41
Feeding pattern	1.98	0.16
Mother's age	1.23	0.27
Parity	0.92	0.38

p-values for Association Between Demographic Variables and Skin Flora



Interpretation:

All p-values are *greater than 0.05*, indicating **no significant association** between demographic variables and post-bath skin flora.

There was no statistically significant association

between any demographic variables and:

- Post-bath body temperature
- Post-bath skin flora composition

($p > 0.05$ for all variables)

This indicates that newborn characteristics do **not influence** the effect of bath on body temperature or skin flora.

Discussion

The findings demonstrate that bathing newborns after 24 hours results in only a mild reduction in body temperature, which remains within normal neonatal limits. This aligns with WHO recommendations that delayed bathing supports thermoregulation. The presence of vernix and maturity of skin after 24 hours protect the newborn from drastic warming loss.

Skin flora analysis showed that normal beneficial bacteria remained dominant even after bathing, indicating that a bath given after 24 hours does not significantly disrupt microbial balance. These findings support controlled bathing practices while maintaining skin integrity and infection prevention.

Conclusion

Bathing newborns after 24 hours of birth is safe and does not cause harmful drops in temperature or negative changes in skin flora. The study emphasizes the importance of implementing evidence-based newborn care practices in hospital settings.

Implications for Nursing Practice

- Nurses should educate mothers on delayed bathing benefits.
- Hospital protocols must align with WHO guidelines.
- Regular monitoring of temperature should follow newborn bathing.

Recommendations

- Replication with larger, multi-center samples.
- Comparative studies between early (<24 hours) and delayed bathing (>24 hours).
- Molecular analysis of skin flora for deeper insights.

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