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Original Research Article

A Comparison of the Effects of Skin-to-Skin Contact Versus Conventional Method on Newborn Body Temperature

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Abstract: *Neonatal thermal protection remains a significant global issue and a challenge for medical professionals. Maintaining the newborn in a natural thermal environment is essential by keeping them on their mother's belly for as long as possible.* ***Objective:*** *The current study aimed to compare the change in newborns mean body temperature after skin-to-skin contact and conventional* ***Method:*** *Materials and method: The current randomised control trial study was carried out at the gynecology and Obstetrics department Sheikh Zayed Hospital and college Rahim Yar Khan over three months from December 16, 2024 to March 16, 2025 after taking permission from the ethical board of the institute. Non-probability consecutive sampling was employed, and the sample size was calculated using the WHO sample size calculator. The sample consisted of 120 participants, divided into two groups of 60 each. Using the lottery approach, the mothers were split into two groups: Group B (skin-to-skin contact) and Group A (baby warmer group). In Group A, the newborns were dried and covered with a warm towel within ten minutes of birth. The infant was kept in a radiant warmer for at least an hour. In Group B, within 10 minutes after birth, the newborns were placed on the mother's chest, preserving skin-to-skin contact. Using a digital thermometer, the principal investigator used data collection procedures to monitor the newborn's axillary body temperature at 15, 30, and 60 minutes after birth. SPSS version 26.0 was used to analyse the data. A p-value of ≤ 0.05 was considered statistically significant.* ***Results:*** *Compared to the A group, participants in the B group were younger. In both groups, the most prevalent age group was 25 to 31 years. The average length of stay in the hospital was 6.5 ± 1.5 hours. The average length of hospital stay using the conventional method was 6.5 ± 1.5 hours, while the average length of skin-to-skin mother contact was 6.7 ± 1.8 hours. Patients' health responses were determined to be 15 (25%) in the Conventional Approach group and 36 (60%) in the Skin-to-Skin Mother-Contact group. After 60 minutes, a statistically significant mean temperature difference was observed between the two groups (p = 0.001); however, no significant mean temperature difference was found after 30 or 15 minutes (p > 0.05).* ***Conclusion:*** *The current study concluded that Skin-to-skin contact should be encouraged and maintained, as it helps lower the risk of hypothermia. It is inexpensive, simple, and promotes bonding between mothers and children.*

Keywords: Skin-to-skin contact; Conventional method: Newborn; Body temperature.

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Introduction

For an infant to survive and be healthy, the first few days after birth are critical. The baby is introduced to an unfamiliar environment after birth, which differs from the conditions of the uterus. Consequently, it is crucial to maintain thermal stability and provide warmth. Maintaining a newborn's body temperature at a normal level is critical to ensure proper physiological functioning (1, 2). The baby's temperature decreased rapidly because the environment changed rapidly throughout pregnancy and after delivery. A neonate that has been delivered loses heat in four main ways: convection, conduction, radiation, and evaporation. To lower neonatal morbidity and death, policies that support a newborn's normal body temperature must be put in place (3, 4). According to research, a statistically significant temperature difference is observed after one hour. Neonatal thermal protection is still a global problem and a difficulty for medical professionals, even with technological advancements that reduce the danger of postpartum hypothermia and offer warmth (5). However, the primary mechanisms of heat loss from the newborn body are conduction and evaporation of amniotic fluid. As a result, neonates rapidly deplete their glucose stores, experience hypoglycemia, respiratory distress, and metabolic acidosis as a prolonged compensatory mechanism (6). Thus, it is essential to maintain the newborn in a natural thermal environment by keeping him close to his mother's body for as long as possible, swaddling him tightly, and covering his head to prevent heat loss (7). Other approaches to keep the baby warm and encourage early bonding include drying them off rapidly, placing them on the mother's bare breast or belly and covering them with a warm sheet until the placenta is delivered or the episiotomy is fixed (7). A newborn may be hypothermic even at room temperature, or 30°C, as heat loss is typically made worse by ambient air (8). Health organizations have extensively recommended skin-to-skin contact (SSC) between the mother and her newborn infant shortly after birth as a beneficial technique for both mother and baby (9). The complex nature of local healthcare procedures, cultural variations, and varying environmental conditions may suggest that findings from overseas research do not readily apply to our situation. With this in mind, research must be conducted in our area to provide medical specialists with data specific to our situation. Therefore, the current study compared the change in newborns' mean body temperature after skin-to-skin contact with the conventional method.

Methodology

The current randomised controlled trial study was conducted at the Gynecology and Obstetrics Department of Sheikh Zayed Hospital and College, Rim Yar Khan, over three months from December 16, 2024 to March 16, 2025 , after obtaining permission from the institute's ethics board. Non-probability consecutive sampling was used, and the sample size was calculated using the WHO sample size calculator with the following parameters. The anticipated mean body temperature of newborns with the conventional and skin-to-skin methods was 1.0°F ± 0.3°F and 0.4°F ± 0.4°F, respectively. Confidence Level = 90%, Power 80%. the sample size was 120(60 in each group.) Babies born with an

Apgar score of >6, and Primigravida and multigravida with no history or medical record of antenatal complications. Admitted at term for spontaneous vaginal delivery. Mothers with a single pregnancy. Newborn with birth weight between 2000 and 4000 g. (The newborn's weight was measured immediately after birth using a digital pediatric weighing scale available at the Department of Gynecology and Obstetrics.)Women awaiting delivery were given informed consent to participate in the study. Mothers who show signs of fetal distress during labour. Mothers who required caesarean section or instrumental delivery. Newborns who needed any resuscitation for survival. Infants with meconial amniotic fluid and without respiratory effort. Babies with congenital anomalies. Mothers having an upper or lower respiratory tract infection.

The attending obstetricians identified mothers and newborns who met the inclusion criteria. Samples were collected at the Gynaecology and Obstetrics Department's Labour Room. Basic demographic information was recorded, including the mother's age, level of education, gravidity, and parity. We recorded the newborn's weight at birth, sex, delivery method, and Apgar score in the first minute of life. Using the lottery approach, the mothers were split into two groups: Group B (skin-to-skin contact) and Group A (baby warmer group). In Group A, the newborns were dried and covered with a warm towel within ten minutes of birth. For at least an hour, the infant was kept in a radiant warmer.. In Group B, within 10 minutes after birth, the newborns were placed on the mother's chest, preserving skin-to-skin contact. The baby was dried with a warm cloth while still conversing with the mother. The baby was covered with a blanket, leaving only the head exposed. With the mother in a semi-reclined posture, the infant was kept in SSC for at least an hour. Using a digital thermometer, the principal investigator used data collection procedures to monitor the newborn's axillary body temperature at 15, 30, and 60 minutes after birth.

SPSS version 26.0 was used to analyse the data. The primary outcome was calculated as the difference between the newborn's baseline axillary body temperature and the temperature measured one hour postpartum. Numeric variables, such as age, week of gestation, APGAR score, parity, and temperature variations, were provided as mean ± standard deviation (SD) for normally distributed data and median (IQR) for non-normally distributed data. Normality of data was assessed using the Shapiro-Wilk test. For the primary outcome (temperature change), an independent t-test (or Mann-Whitney U test if the data is non-normal) was used to compare the mean changes between the two groups. Categorical variables, such as parity and sex, were presented as frequencies and percentages. Potential effect modifiers, including age, gender, gravidity, parity, and mode of delivery, stratified data. Post-stratification t-tests were used to assess the effect of these potential confounding variables on the outcome. A p-value of ≤ 0.05 was considered statistically significant.

Results

In the current study, a total of 120 women were enrolled, equally divided into Group A and Group B. The mean age of the study population was 25.6 ± 6.0 years. Participants in Group A had a mean age of 26.5 ± 5.0 years, whereas those in Group B were 24.8 ± 4.7 years. Compared to the A group, participants in the B group were younger. Both groups' most prevalent age group was 25-31 years, as presented in Table 1. In group B, 31 (51.66%) of the participants had a gravida of 1 to 6 children, whereas in group A, 30 (50%) of the individuals had this condition, as shown in Table 2. When comparing group "B" to group "A," it was found that 28 (46.66%) of the patients had parity between 1 and 4 children, as presented in Table 3. The average length of stay in the hospital was 6.5 ± 1.5 hours. The average length of hospital stay using the conventional method was 6.5 ± 1.5 hours, while the average length of skin-to-skin mother contact was 6.7 ± 1.8 hours. Patients' health responses were determined to be 15 (25%) in the Conventional Approach group and 36 (60%) in the Skin-to-Skin Mother Contact group, as presented in Table 4. In group A, maternal response was observed in 15 individuals (25%), compared to 36 individuals (60%) in group B (Table 5). After 60 minutes, a statistically significant mean temperature difference was observed between the two groups ($p = 0.001$). However, no significant mean temperature difference was found after 15 or 30 minutes ($p > 0.05$), as shown in Table 6.

Table 1. Distribution of Age in the Two Groups

Age groups in years	Skin to skin mother contact N=60	Conventional Approach N=60
18 to 24	20(33.3%)	16(26.66%)
25 to 31	26(43.33.66%)	30(50%)
32 or above	14(23.33%)	15(25%)
Mean standard deviation	28.6 ± 5.3	26.9 ± 4.8

Table 2. Gravida Distribution by Group

Gravida	Skin to skin mother contact N=60	Conventional Approach N=60
PG	17(28.33%)	18(30%)
1 to 6	30(50%)	31(51.66%)
7 to 10	13(21.66%)	11(18.33%)

Table 3. Parity distribution by group

Parity	Skin to skin mother contact N=60	Conventional Approach N=60
Zero	15(25%)	17(28.66%)
1 to 4	28(46.66%)	28(46.66%)
5 to 8	17(28.66%)	15(25%)

Table 4. Group-by-group distribution of health responses

Personal response	Skin to skin mother contact N=60	Conventional Approach N=60
No response	15(25%)	17(28.66%)
Dislike	7(11.66%)	28(46.66%)
Like	36(60%)	15(25.0%)

Table 5. Mother's response distribution by groups

Personal response	Skin to skin mother contact N=60	Conventional Approach N=60
No response	15(25%)	17(28.66%)
Dislike	7(11.66%)	28(46.66%)
Like	36(60%)	15(25%)

Table 6. Temperature comparison by group at various points in time

Temperature in Fahrenheit	Skin-to-skin mother contact (N=60)	Conventional Approach (N=60)	Mean Difference	P Value
	Mean ± Standard Deviation	Mean ± Standard Deviation		
After 15 minutes	98.2 ± 1.0	97.3 ± 1.1	0.123	0.566
After 30 minutes	97.8 ± 0.9	97.6 ± 1.0	-0.231	0.257
After 60 minutes	98.3 ± 0.6	97.8 ± 0.9	-0.515	0.001

Discussion

Since a child lacks a shivering mechanism that prevents them from producing heat, maintaining body temperature is one of their most critical needs after birth. This causes its temperature to drop quickly (10). The standard treatment for preventing hypothermia nowadays involves placing the baby beneath a warmer, which separates the mother from the infant. Encouraging a strong bond between the mother and child is one of the nurse's most crucial responsibilities. To perform this duty and treat hypothermia, nurses employ a practical and effective technique known as skin-to-skin contact between the mother and the infant (11). The World Health Organization recommends that skin-to-skin contact between mothers and newborns be practiced regardless of age, birth weight, and clinical status; however, only 32% of American hospitals permit skin-to-skin contact between mothers and newborns for at least two hours after delivery. The typical approach is to place the baby under radiant heating in the operating room and nursery (12). The purpose of this study was to get opinions from Pakistani medical professionals. Despite the study's encouraging findings on skin-to-skin contact (SSC) between mothers and their newborns, Pakistan and other low-income nations do not often utilise this technique. No research has elucidated the causes. Numerous newly published studies have demonstrated the multiple advantages of skin-to-skin contact shortly after birth, including the release of oxytocin in the mother's blood, which promotes quicker placenta evacuation and less uterine hemorrhage (13, 14). Additional advantages for newborns include heart rate control, improved oxygen saturation resulting from SSC, and stabilisation of the newborn's body temperature and respiration (14). The natural procedure to begin breastfeeding shortly after delivery is called Skin Contact (SSC). It is a new, simple, widely accessible, and easily replicable method that helps mothers naturally initiate breastfeeding (15). The human newborn baby, like all mammals, has the innate capacity to crawl over their mother's tummy to locate her breast for nursing as soon as they are born, a skill that was first observed in Sweden in 1987 (14). A newborn is often active just after delivery before entering a deep slumber phase. When relaxation and recuperation are necessary, it is the ideal time to latch onto the breast (16). Long-term breastfeeding success is positively impacted by the first latch-on, which is crucial. Its primary advantages include significantly decreasing childhood mortality, morbidity, and malnutrition. Early initiation within the first hour after delivery can prevent 22% of infant mortality in underdeveloped nations (17). In the current study, the average length of hospital stay using the conventional method was 6.5 ± 1.5 hours, while the average length of skin-to-skin mother contact was 6.7 ± 1.8 hours. Participants' health responses were determined to be 25% in the Conventional Approach group and 60% in the skin-to-skin mother Contact group**.** In group A, the mother's response was observed in 25% of individuals, in contrast to 60% in group B. The findings of our study are consistent with those of Irum, Sadia, et al. (18). This study revealed a statistically significant mean temperature difference between the two groups after 60 minutes ($p = 0.001$). However, there was no significant mean temperature difference after 1 or 5 minutes ($p > 0.05$). These findings are consistent with those of a previous study. Due to the excessive workload in our setting, this study may aid in developing novel procedures for regulating a newborn's body temperature. Because it is a simple, very efficient, and time-saving procedure, allowing mother and infant skin-to-skin contact can prevent many newborns from suffering from hypothermia.

Conclusion

The current study concluded that Skin-to-skin contact should be encouraged and maintained, as it lowers the risk of hypothermia. It is inexpensive, simple, and promotes bonding between mothers and children.

Declarations

Data Availability statement
All data generated or analysed during the study are included in the manuscript.
Ethics approval and consent to participate
Approved by the department concerned. (IRBEC-TVCNB-24)

Consent for publication
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Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

YB
Manuscript drafting, Study Design,
SMK
Review of Literature, Data entry, Data analysis, and drafting an article.
SA (PGR)
Conception of Study, Development of Research Methodology Design, Study Design, manuscript review, and critical input.

All authors reviewed the results and approved the final manuscript version. They are also accountable for the integrity of the study.

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