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Original Research Article

Skill development of father and mother regarding skin care and oil massage of preterm neonates

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ABSTRACT

Background: The skin of pretmature neonates require a special care as it is thin, the pH is low, and they lose more heat and water. Due to the increasing number of preterm births, the stable preterm babies get an early discharge early from the hospital. At home they require meticulous skin care for their survival and both father and mother are equally responsible for providing care to their preterm neonates. Henceforth it is essential to develop an evidence-based protocol and train both father and mother in the care of the preterm neonate

Aim: To develop a protocol and check its effectiveness in skill development of parents (father and mother) regarding skin care and oil massage of their preterm neonates admitted in Neonatal units, Nehru Hospital, PGIMER, Chandigarh

Settings and Design: Neonatal Nursery (NNN), Maternity ward, Nehru Hospital, PGIMER, Chandigarh. A quantitative research approach and operational design were selected.

Material and Methods: The study was conducted on 45 parents of 31 neonates selected using the total enumeration sampling technique. Protocol on the skin, eye, cord care and oil massage of preterm neonates was developed, validated, demonstration, and return demonstration were taken after the pretest. Observational checklists were used to assess the father and mother's skills in three-four consecutive observations.

Results: Data was analyzed using SPSS version 20.0. Maximum 30(97%) mothers became skilled in the third observation; on the other hand, more fathers achieved skill by the fourth observation. Once all the father and mother achieved skill performance of 85-90%. The final return demonstration was taken on their preterm neonate. A significant improvement in skills scores of both fathers' and mothers' was observed within and in between the subsequent observations.

Conclusion: The research shows that there was a significant increase in the skills of father and mother. This shows that the operational study to develop a protocol and check its effectiveness in skill development of parents (father and mother) regarding skin care and oil massage of their preterm neonates was a success.

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1. Introduction

Prematurity has been defined based on gestational age in weeks at birth. The term "prematurity classified into three categories as per WHO: Extremely preterm (<28 weeks), very premature birth (28-32 weeks) and moderate to late preterm (32-37 weeks)." [1]

The organs of the premature infant are underdeveloped. Skin is one of the organs which is also underdeveloped and is very thin. Stratum corneum is formed at 21 weeks of gestation. At 28 weeks, stratum corneum consists of 2-3 cell layers. By 32 weeks of gestation, there are more than 15 layers.[2] At birth, the epidermal thickness of full-term neonates is 43±7 micrometers versus 31±7 micrometers for preterm infants. Exposure to external environments stimulates and accelerate the maturation of the epidermal barrier. Among premature neonates, the process of maturation of skin differs with gestation age. In babies born at <25 weeks of gestation age, it takes 8-10 weeks for the stratum corneum to mature, while in those of >27-28 weeks of gestational age, it reaches full maturity in about ten(10) days.[2]The immature stratum corneum has increased permeability, reduced protective function, increased absorption of applied substances, increased colonization, consequent risk of infection, and increased transepidermal water loss.[3] A recent randomized control trial was conducted in very low birth preterm babies. Application of coconut oil topically twice a day during the first week of life was found to decrease the Transepidermal Water Loss (TEWL) by approximately 46%. Oil massage can promote better growth, reduce fluid requirement, and initial weight loss. Another evidence shows that oil application also promotes weight gain among very low birth weight preterm neonates.[4] Therefore care should be provided to preserve the integrity and quality of a preterm newborn's skin. It is essential to maintain the PH of preterm neonate's skin by using light soap that does not take away PH, reduces insensible water loss, minimizes heat loss, and reduce skin breakdown.[5] Thus umbilical cord should be kept as clean and dry to reduce the risk of infection. Only plain water can be used for cleaning as there is no such evidence that other measures such as cleaning or drying agents, including sprays, cream, or powder, are useful for cord care.[4]Proper care of the nappy area reduces the breakdown of the stratum corneum and maintains skin integrity. Evidence suggests that the incidence of nappy rash may be reduced if nappy is changed frequently during the day and at least once during the night.[6]

Hence meticulous skin care is very important for their survival. On the other hand, due to the hospital's increased burden, the preterm neonates get early discharge. This increases the need for proper knowledge and skills of skin care at home. Both father and mother are equally responsible for the care of preterm neonates as this increases bonding and decreases the burden of the mother. Hence, it is essential to develop the father and mother's skills regarding skin care of preterm neonates. Additionally, the literature review revealed no protocol exists regarding skin care of preterm neonates for the father and mother of preterm neonates.

Considering the need to develop father and mother's skill on skin care of preterm neonate, the present study was planned.

2. Aim

To develop a protocol and check its effectiveness in skill development of parents (father and mother) regarding skin care and oil massage of their preterm neonates admitted in Neonatal units, Nehru Hospital, PGIMER, Chandigarh

2.1. Research methodology

An operational research study was conducted to develop a protocol and check its effectiveness in parents' skill development (father and mother) regarding skin care and their preterm neonates' oil massage. Data were collected from 10^{th} April to 25^{th} April 2019 through the total enumeration sampling technique, and 45 parents who were willing to study and understand Hindi, English, and Punjabi were included as a sample. Permission was taken from the institute's ethics committee and informed written consent was obtained from participants. Tools, an Interview schedule (Socio-demographic data of father and mother and clinical profile of preterm neonates) and observational checklist to assess father and mother skills regarding skin care and oil massage of preterm neonates were used. Protocol on skin, eye, and cord care of preterm neonates was developed after validation from experts. Data were collected through pretest, demonstration, and return demonstration. In the pretest, data were collected through interviews with father and mother and observation of baseline skills regarding skin, eyes, cord card care and oil massage using an observational checklist. Data were collected through return demonstration on simulators until participants reach skills by more than 85%-90% and final demonstration on the preterm neonates. Descriptive and inferential statistics was used for analysis and interpretation of data. Tables and figures were used for the presentation of data.

3. Results

3.1. Clinical profile of the Preterm neonates

Thirty-one preterm neonates were enrolled; out of 31, three quarter 23(74%) of neonates were more than 15 days old, and few 3(9%) were more than 30 days. More than half 17 (54%) were boys, and less than half 14(45%) were girls. More than half 17(54%) of neonates were born between

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34-36 weeks of gestation. Sixteen neonates (51.6%) were between 1500-2000 gm at birth, and only 4(12%) neonates were more than 2000 gm. Neonates with prematurity, low birth rate, and respiratory distress were 51%, 32%,16%, respectively.

3.2. Socio-demographic profile of father and mother and father

Total 45 parents of 31 babies were included in the study. All 31 mothers participated; however, only 14 fathers could be enrolled due to the reeeason specified in fig 1. The mean age of mothers and fathers was 31.14 ± 5.53 and 27.19 ± 4.086, and half of them were educated up to senior secondary (Table 1). The majority of 28(90.3%) mothers were housewives, and 11(78.6%) of fathers were private employees. Out of 45 subjects, about three quarter 23(74%) of parents were Hindu. Subjects living in a joint family were 19(61.3), whereas 1(3.2%) lived in extended family. About half 15(48%) of parents had more than 3000 rupees per capita income.

The percentage of scores gained on the checklist was divided into five categories (Poor<30%, Fair 31-50%, Good 51-70%, Very good 71-90%, Excellent 91-100%), to assess skill development progress. After each return demonstration, the corrective steps were suggested, and the return demonstrations were taken till all the steps were performed correctly. In the first observation, the majority of 12 (86%) fathers were in the poor category; however, only 21 (68%) of mothers were in this category. Their practices shifted to the excellent category by the fourth observation.

The comparison of mean± SD of fathers and mothers scores during skin care (Table 2) and oil massage (Table 3) showed an ascending pattern with respect to all the 3 observations made. The repeated measure ANOVA showed a significant improvement (p<0.001) in both mothers' and fathers' scores during subsequent observations. T test was used to compare the difference in mean scores of fathers and mothers in each observation. During pre-observation, mothers' scores were significantly higher than the father's scores (p 0.032) in skin care procedure, however, no significant difference was observed in the oil massage procedure. No significant difference was observed in 1^{st} observation, whereas a significant difference was observed in 3^{rd} and 4^{th} observation (p<0.05).

The comparison of mean± SD of time taken by fathers and mothers during skin care of preterm neonate showed an ascending pattern in respect to the 3 observations made. The comparison was made between father and mother observations using repeated measure ANOVA indicates a significant improvement (p<0.001).

Table 1: Socio-demographic profile of Parents. N=45

Variables	Father n = 14 n(%)	Mother n = 31 n(%)
Age (years)		
20-25	2(14.3)	11(35.5)
25-30	6(42.9)	16(51.6)
30-35	2(14.3)	02(6.5)
>35	4 (28.5)	02 (6.5)
Educational status		
Primary and middle class	01(7.1)	08(25.8)
Secondary and senior Secondary	08(57.1)	16(51.6)
Graduation	02(14.3)	02(6.5)
Post-Graduation and above	03(21.4)	05(16.1)
Occupation status		
Private Employee	11(78.6)	01 (3.2)
Labourer /worker	03(21.4)	—
Unemployed/House wife	—	28 (90.3)
Religion		
Hindu	23 (74.2)	
Muslim	02 (6.5)	
Sikh	06 (19.4)	
Type of family		
Nuclear	11 (35.5)	
Joint	19 (61.3)	
Extended	01 (3.2)	
Per capita Income		
<1000	02 (6.5)	
1000-3000	14 (45.2)	
>3000	15 (48.4)	

Mean ± SD Father's age 31.14 ± 5.53(22- 41)
Mother's age 27.19 ± 4.09(20- 36)

4. Discussion

Neonatal skin care has been an important clinical concern for health care providers working in neonatal units in India. Nurses teach skin care to mothers visiting NICU's. However, no protocol exists in India to improve parents' skills on skin care of preterm neonates. Mostly mothers are more concerned and involved in neonates' care. Fathers have less involvement in the care of newborn. They are concerned about their neonates, but they are unable to provide proper care due to lack of knowledge. This is the reason the fathers were involved as in this study. A protocol was developed on the skin care of preterm neonates for the development of the skills of fathers and mothers. This will allow the father to learn and provide skin care with the mother to their neonates. The involvement of fathers decreases the burden of mothers and increases the father-baby bonding. A study conducted by Aibiang P et.al. also

Table 2: Comparison of mean score of father and mother during skin care of preterm neonates

Skin care	Pre Observation	Observation1	Observation 2	Observation 3	F value(df) P value
Father Mean ± SD(Range)	6.50±2.53 (3-11)	17.93±5.26 (6-27)	27.43±3.85 (2-32)	31.57±1.91 (28-31)	282.703 (3) <0.001*
Mother Mean ± SD (Range)	8.71±3.29 (4-16)	20.71±4.98(10-29)	29.35±2.21(23-33)	32.68±0.87 (30-33)	515.774 (3) <0.001*
t value (df) P value	2.223 (43) 0.032*	1.702 (43) 0.096	2.126 (43) 0.039*	2.688 (43) 0.010*	

(*p< 0.05 significant)

Table 3: Comparison of mean score of father and mother during oil massage of preterm neonates

Oil massage	Pre Observation	Observation1	Observation 2	Observation 3	F value (df) P value
Father Mean ± SD (Range)	2.21±1.52 (0-5)	7.50±2.34 (2-11)	10.50±1.74 (7-13)	13.64±1.33 (11-15)	148.189 (3) <0.001*
Mother Mean ± SD (Range)	3.42±2.36(0-10)	8.74±2.58(2-14)	12.23±1.64(2-14)	14.84±0.45(7-14)	269.001 (3) <0.001*
t value (df) P value	1.744 (43) 0.088*	1.535 (43) 0.132	3.196 (43) 0.003*	4.491 (43) 0.000*	

(p< 0.05 significant)

Table 4: Time taken by father and mother during skin care of preterm neonates

Skin care	Pre Observation	Observation 1	Observation 2	Observation 3	F value(df) P value
Father Mean ± SD (Range)	19.57±3.77 (10-25)	14.93±2.36 (10-19)	12.57±1.91 (10-15)	10.57±2.02 (8-15)	54.845 (3) <0.001*
Mother Mean ± SD (Range)	17.74±3.19 (11-25)	14.81± 2.93 (7-20)	11.52 ± 2.12 (7-15)	9.87 ± 1.87 (6-15)	90.785 (3) <0.001*
t value (df) P value	1.475 (43) 0.147	0.137 (43) 0.892	1.588 (43) 0.120	0.894 (43) 0.376	

* P value less than 0.05 is significant

included the fathers in baby handling and clothing.[7] The age of fathers in their study was 24-29 years, and they were educated up to senior secondary and were private employees, in the current study the education and work profile was the same, whereas the age of fathers was 22-41 years. On the other hand, most of the mothers' age was 25-30 years and were educated up to senior secondary and were housewives. Similarly, Ayse G. 2012 also reported the same age, education, and work profile of mothers who participated in neonates' skin care.[8]

Aibiang P et al. also reported that 72 first-time fathers participated in the neonate's clothing and handling,[7] whereas only 14 fathers participated in the present study. Seventeen fathers didn't participate, the reason attribute to this are typical view of half of the fathers that this is not a job of the father and the mother/grandmother only performs it. On the other hand, one-third of fathers were busy in hospital work, and few were not available due to their work.

Additionally, Navkiran (2013) conducted a study to develope the skills of nurses. The study consists of pretest, demonstration and consecutive 4 observations.[9] Similarly, the present study includes pretest, demonstration first, second, third and fourth observations. Comparably Sagar S, (2014) conducted a study to develop caregivers' skills on colostomy care by demonstration and 5 consecutive observations were made.[10] All authors used checklists to assess the skill.[7,9,10] Similarly, in the current study observation checklist was used to ensure the correct steps followed by fathers and mothers during pretest to 4^{th} observations of their return demonstrations. These checklists prepared to ensure that each subject follows each step. Each correct step was scored until the achievement of 100% score to ascertain adequate, appropriate, and complete fathers and mothers' training.

Sagar S (2016), Navkiran (2013) and Prakash O (2016) studies showed gradual increase in skill scores of the participants.[9–11] Similarly, in the present study, participants also improved skill scores during subsequent observations (p< 001). In the Navkiran's et al. study, performance was divided in different categories i.e. poor, fair, good, very good, excellent. Similarly, in the present study, performance skill score were categorized into poor (<30%), fair (31-50%), good (51-70%), very good (71-90%), and excellent (91-100%). Both studies show the increase in performance score from poor to excellent by pretest to fourth observation.

In the present study, the simulator was used for pre-observation, demonstration and return demonstration of fathers and mothers till they achieved >85-90% skill scores—final demonstration conducted on their preterm neonates. The simulator was used to minimize the

unnecessary exposure, risk of infection and hypothermia to neonates. Similarly, JB Cooper conducted a study to develop clinical education and training skills and proper skill development in clinical educators by using a mannequin simulator.[12] Additionally, Rajesh A (2010) conducted a study on training and simulation for patient safety among healthcare professionals.[13]

Navkiran's study shows the gradual increase in the subjects' mean scores throughout the subsequent observations with significant $p<0.001$.[9] Similarly, in the present study, during pre- observation mothers' scores were significantly higher than the father's $p<0.032$ and similar trend was seen during observation 3^{rd} and 4^{th} Comparison was made between the observation of father and mother using repetitive measure ANOVA and significant improvement $p<0.001$ was seen.

The study results show that with pretest, demonstration, and returns demonstration the fathers and mothers were able to develop skin care skills. In the net shell, it can be concluded that the introduction of protocol and training of father and mother of preterm neonates for use of skin care can increase the use of the protocol in units.

The majority mothers and fathers had poor skills regarding preterm neonates' skin care in first observation. The planned demonstrations and return demonstrations were successful in enhancing the skills of mothers and fathers in skin care of preterm neonates. It is essential to develop the skills of mothers and fathers as they play a vital role in providing care to their neonates, this will make them more skilful at providing better care to their preterm neonates. The result shows a significant improvement ($p<0.01$) between the observations of father and mother, and also during observations, mothers shows significantly higher ($p<0.032$, $p<0.039$ and $p<0.010$) than the father. The observation during skin care is essential and vital, so there is a need to on-going evaluation and refinement of such guidelines regularly

5. Recommendation

The protocol on skin care of preterm neonate by mother and father should be included in the nursing practice and curriculum. Special clinics should be arranged for counseling the parents for skin care. Workshop and In-service education program should be planned related to neonates' skin care through which the nurses can learn about facts, importance, and protocol of skin care and further use that knowledge to parents.

6. Conflicts of Interest

All contributing authors declare no conflicts of interest.

7. Source of Funding

None.

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