

Effect of Newborn-care Practices for Postnatal Mothers on Occurrence of Selected Health Problems among Their Newborn Infants

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Abstract Newborn care practices by mothers immediately after birth are important determinants of neonatal mortality. To reduce neonatal mortality and morbidity, WHO recommends essential newborn care practices including promotion and support for early initiation of exclusive breastfeeding, thermal protection including promoting skin-to-skin contact, hygienic, umbilical cord, eye care and skin care among others [1]. The aim of this quasi-experimental study was to evaluate the effect of newborn-care practices for postnatal mothers on occurrence of selected health problems among their newborn infants. A total of 50 postnatal primigravida mothers with their newborn infants who attended the postnatal units at El-Manial maternity hospital in Cairo, Egypt, were recruited for this study. The required data was collected through A structured interview questionnaire; newborn follow-up sheet; (were developed by the researchers) and an observation checklist. Results indicated that the mean age of the study sample was 22.54 ± 3.62 years old, 64% of the postnatal mothers was living in rural areas, 60% of the postnatal mothers can read and write, 64% of the postnatal mothers' delivered male newborn, the birth weight of the newborn range was 2-3.75 Kg with a mean of 3.2 ± 0.48 Kg, 76% of the newborn their GA ranged between 37-39 weeks. The results also revealed that a highly statistical significant difference has been found between means of mothers practice as regards eye care, cord care and diaper care pre and post intervention as ($p < 0.0001$). In addition, there were highly statistically significant difference has been found between levels of practice between pre and post – practice as ($p < 0.0001$). Regarding newborn follow-up, the results revealed that the minority of newborns (6%) developed diaper redness, 2% developed eye problem (discharge) and 96% their cord sloughed off before the end of the two weeks while 4% had delayed cord slough off. This study concluded that, mothers who received the newborn-care practices had higher total mean score of practice than before and the majority of them had satisfactory level of practice regarding the care of the newborn infants. The results also concluded that most of newborn infants of the mothers who received the intervention not exposed to the occurrence of diaper rash, eye problems and their cord slough off within expected time.

Keywords: newborn- care practices, selected health problems

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1. Introduction

Childbirth and neonatal period have great emotional effect on families and could be considered as new experiences in life. Newborn care is strongly influenced by mother's social status, health status, and home care practices for mother and newborn as well as maternal and newborn care services. Traditional care practices at home and in the community inevitably affect maternal and newborn health [2]. In 2016, World Health Organization (WHO) estimated that 2.6 million children died in the first month of life from conditions and diseases associated with lack of quality care at birth or skilled care and treatment immediately after birth [1]. Pregnant women and young

children in Egypt face persistent health challenges. In Egypt, Neonatal mortality has been declining more slowly than under-five mortality and now accounts for 52% of all under-five deaths [3,4].

Healthy newborn today, make a healthier nation tomorrow, the role of the mother in creating a healthy nation is eminent and beyond explanation. Among the life span of the childhood period, the neonatal period is very crucial to large extent determines the overall health status of the child and in turn adult life (Egypt Demographic and Health Survey, 2014). Birth is a major challenge to the newborn to negotiate successfully from intrauterine to extra uterine life. The newborn infant is considered to be tiny and powerless, completely dependent on others for life [5].

Neonates are at risk for various health problems, even though they are born with average birth weights. The

morbidity and mortality rates in newborn infants are high, the neonatal mortality rate was 14 deaths per 1,000 births. They need optimal care for improved survival [6]. Neonatal care is highly cost-effective because saving the life of a newborn baby is associated with survival and productivity of the future adult. Although parents are ultimately responsible for this care, nurses usually assume a major care-giving role while the infant is in the nursery [7,8]. Good hygiene by nurses; mothers would reduce the likelihood of cold, dermatitis, herpes, and skin diseases being spread to more sensitive individuals in the family. Newborn babies are also at risk from maternal infection if hygiene is not adequate. The daily cleansing of the infant affords an excellent opportunity for making the observation that necessary during the immediate postnatal period [9].

Newborn care practices by mothers immediately after birth are important determinants of neonatal mortality. To reduce neonatal mortality and morbidity, WHO recommends essential newborn care practices including promotion and support for early initiation of exclusive breastfeeding, thermal protection including promoting skin-to-skin contact, hygienic, umbilical cord, eye care and skin care among others [1]. The neonatal nurse plays an imperative role in disease prevention and health promotion. Education programs with effective teaching strategies motivate mothers to follow healthy practices in day-to-day life. The educative role of the nurse needs to be emphasized. Furthermore, newborn health is directly linked to maternal health and hence improving birth outcomes depends on also improving maternal health care during pregnancy through antenatal care, skilled delivery, and the postpartum period by providing postpartum care. Improvements in maternal health care will help reduce newborn deaths [10].

1.1. Significance of the Study

In Egypt, the neonatal mortality rate was 14 deaths per 1,000 births. Children who die within the first 28 days of birth suffer from conditions and diseases associated with lack of quality care at birth or skilled care and treatment immediately after birth [6]. Mother's education of newborn-care practices and the enhancement of the role of nurse can lead to improvements of the mother's outcome and process of care during postnatal period. However, there is a dearth of literature regarding newborn-care practices among postnatal mothers in Egypt, and most newborn-care practices such as eye care, cord care, and diaper care are performed by their care givers. This study therefore aimed to describe the essential newborn care practices among postnatal mothers in order to inform policy and development of feasible and sustainable maternal and child health-based interventions that can improve the survival of newborn.

1.2. Aim of the Study

The study aimed to evaluate the effect of newborn-care practices for postnatal mothers on occurrence of selected health problems among their newborn infants.

1.3. The Research Hypotheses

To achieve the aim of the current study the following research hypotheses were formulated:

H1. Postnatal mothers who received the newborn- care practices will have higher mean score of practice than before.

H2. Newborn infants of postnatal mothers who received the newborn- care practices will be exposed to less health problems.

1.4. Operational Definition

Newborn- care practices: newborn care practices in the current study means: eye care, cord care, and diaper care.

Health problems: it means health problems of newborn infants related to their eyes, cord, and diaper area.

2. Subjects and Methods

Research design and setting: one-group pre-posttest quasi-experimental design was used in the current study, which was carried out in the postnatal units at El-Manial maternity hospital in Cairo, Egypt. It is a university affiliated to Cairo University hospitals providing free health care to maternity as well as gynecological clients, being large university hospital in a metropolitan city.

Subjects: A non-probability purposive sample of 50 mothers participated in the current study sample according to the inclusion criteria postnatal primigravida mothers with their newborn infants, can read and write. Exclusion criteria: Mothers who delivered a premature or died newborn were excluded, also, mother whose neonate has significant congenital anomalies and newborns delivered with eye, cord or skin disorders were also excluded, or mothers attended a previous similar training.

Tools for data collection: Three tools were used for data collection. A structured interview questionnaire; newborn follow-up sheet; (were developed by the researchers based on an extensive review of relevant literature) and an observation checklist.

- A semi-structured Interview Questionnaire: it included mother's personal data as age, educational level, and residence. And new born characteristics as gestational age, gender, and birth weight.

- Newborn Follow-up Sheet: It was concerned with follow-up to detect the occurrence of the selected health problems in the cord, eye or diaper area and also time of slough off the cord after two weeks from interventions.

- An observation checklist: three observational checklists for newborn-care practices were adopted from *Hockenberry and Wilson* [11] These were for eye care (9 items), cord care (12 items), diaper care for males (20 items), and diaper care for females (23 items) .Each step was to be checked as "correct" or "incorrect" these were scored one and zero respectively. The scores of each checklist and for total practices were summed-up and converted into percent scores. And then categorized as following: the total score of practice less than 50% was considered as unsatisfactory while score of 50% and more of practice was considered as satisfactory level.

2.1. Validity and Reliability

The tools were thoroughly reviewed by three experts in pediatric nursing and maternal & newborn health nursing for content validation. As per their opinions, no modifications were required. Reliability of the tools was performed to confirm its consistency. The reliability coefficients' alpha between questions was 0.71.

2.2. Pilot Study

A pilot study was carried out on 5 mothers representing 10% of the total sample to test study tools in terms of their clarity, applicability and time required to fill. Since no modifications were done, these mothers were included in the sample.

2.3. Procedure

Upon obtaining official permission from director of El-Manial maternity hospital in Cairo, Egypt, data were collected through four phases: assessment, planning, implementation, and evaluation & follow-up phases.

Assessment phase: the practices were delivered through the following four sessions: **First session**, the researchers met with the postnatal mothers and their newborn infants in the postnatal units at El-Manial maternity hospital for a clear and simple explanation of the aim and nature of the study. Those who fulfilled the eligibility criteria and gave their written consent were participated in the study sample. Each mother was asked to carry out the newborn care practices (eye care, cord care, and diaper care) as a pretest and was observed using the corresponding checklists.

Planning phase: during this phase, the researchers prepared and designed teaching materials in simple Arabic language based on pertinent literature review; it included the steps of newborn care practices with illustrated pictures to facilitate teaching of practices.

Implementation phase: Each mother was informed about the importance of the newborn care- practices under the current study. Steps of eye care and cord care were explained with teaching materials and demonstrated by the researchers and re-demonstration were carried out by each mother individually on a small doll. The researchers observed each mother, and reassured the mother if any mistakes were committed, and discussed it took about 20 to 30 mints. **Second sessions**, the researchers explained the importance and demonstrate the steps of diaper care used the teaching materials. Re- demonstration was carried out by each mother on small doll if any mistakes were observed and discussed by the researchers; it took about 20 to 50 mints.

Evaluation & follow-up phase: **Third session**, the effect of the newborn-care on mothers' practice was assessed immediately after the implementation phase (post- observational checklist) it took about 30 to 45 mints, **Fourth session** as well as two weeks later (follow-up). These were done using the newborn follow up sheet it took about 20 to 30 mints. The field work was carried out from the beginning of July to the end of December 2017.

2.4. Ethical Considerations

Ethical approval was obtained from the research ethical committee of the Faculty of Nursing, Cairo University.

Then official permission was granted from director of El-Manial maternity hospital in Cairo, Egypt, to facilitate data collection process. The researchers explained the aim of the study to the mothers and informed them that the information obtained will be confidential, their participation was in a voluntary base and they have the rights to refuse and/or withdraw at any time without providing a reason and without any effect on the mothers and their newborn routine care. A written Informed consent was taken from women to obtain their acceptance to participate in the research.

2.5. Statistical Analysis

Data entry and statistical analysis were done using SPSS 20.0 statistical software package. Descriptive statistics included frequencies and percentages for qualitative variables, and means and standard deviations for quantitative variables, one's descriptive statistics and frequencies were run to examine normality and determine if any skewness or kurtosis occurred. Assessment of normality was made through histogram; 95% confident interval (CI). Parametric and non-parametric inferential statistics as (paired t-test, two related sample test and Chi-square test) were used. For all of the statistical tests done, the threshold of significance was fixed at the 5% level (P-value). A p-value > 0.05 indicates non-significant results and a p-value <0.05 indicates a significant result. The smaller the p-value obtained, the more significant is the result.

3. Data Analysis and Finding

The aim of the current study was to evaluate the effect of newborn-care practices for postnatal mothers on occurrence of selected health problems among their newborn infants. Finding of this quasi experimental study will be presented in four main sections: description of the sample, pre and post-practice of the postnatal mothers, follow-up of the newborn health problems after two weeks, and relations among variables.

Section I: Description of the Sample

Description of the sample personnel characteristic includes age of the postnatal mothers, residence, and educational level. The age of the sample range was 18-34 year with a mean of 22.54 ± 3.62 years old, 16% of the sample in the age group < 20 years, 58 % was in the age group 20<25 years, 18% in the age group 25<30, while, only 8% was in the age group ≥ 30 years, 64% of the postnatal mothers was living in rural areas while, 36% living in urban area,. In relation to level of education, 60% of the postnatal mothers can read and write, 36% of the postnatal mothers had primary school education, and 4% of the postnatal mothers received secondary school education.

Regarding newborn characteristics, includes newborn gender, gestational age (GA) and birth weight. Sixty four percent of the postnatal mothers' delivered male newborn while, 36% delivered female newborn. In relation to newborn gestational age, 76% of the newborn their GA ranged between 37-39 weeks and, 24% of them ranged between 40-42wks with a mean of 38.7 ± 1.5 weeks. The

birth weight of the newborn range was 2-3.75 Kg with a mean of 3.2±0.48 Kg.

Section II: Pre and post-practice of the postnatal mothers

This section covers three main parts; eye care, cord care, and diaper care.

As shown in Table 1, the majority of postnatal mothers had incorrect practice of eye care before the intervention. At the post intervention, there were statistically significant improvements in all steps of this procedure; the vast

majority percentage of postnatal mothers (96%) had correct practice. In total, pre-intervention the mean score was 1.54 ± 2.12 out of 9 compared to 8.8±0.94 post intervention.

Concerning mother's percentage of cord care, Table 2 shows that, the most of mothers had incorrect practice in almost steps of cord care before the intervention, while the majority of them had correct practice after the intervention. In total, pre- intervention the mean score was 1.7±1.6 out of 12 compared to 11.04±2.46 post intervention.

Table 1. Percentage distribution of postnatal mothers pre and post- practice regarding eye care (N=50)

Steps	Pre-practice				Post-practice				Chi-square	
	Correct		Incorrect		Correct		Incorrect		X ²	P
	No	%	No	%	No	%	No	%		
Wash hands with soap & water	13	26	37	74	50	100	00	00	11.52	<0.001
Prepare the equipment at the child bedside.	13	26	37	74	50	100	00	00	11.52	<0.001
Check water temperature by wrist/elbow joint.	14	28	36	72	48	96	2	4	42.32	<0.001
Wipe each eye with the moist sponge from the inner to outer aspect.	2	4	48	96	50	100	00	00	45.32	<0.001
Beginning with the far eye, then the near.	2	4	48	96	50	100	00	00	45.32	<0.001
Dry gently each one.	11	22	39	78	48	96	2	4	15.68	<0.001
Apply antiseptic eye drops as ordered.	5	10	45	90	48	96	2	4	32.0	<0.001
Remove equipment.	11	22	39	78	48	96	2	4	15.68	<0.001
Wash hands with soap & water.	8	16	42	84	50	100	00	00	23.12	<0.001
Mean± SD	1.54 ± 2.12				8.8±0.94					

Table 2. Percentage distribution of postnatal mothers pre and post- practice regarding cord care (N=50)

Steps	Pre-practice				Post-practice				Chi-square	
	Correct		Incorrect		Correct		Incorrect		X ²	P
	No	%	No	%	No	%	No	%		
Wash hands	14	28	36	72	50	100	00	00	9.68	0.002
Prepare the equipment at the child bedside.	3	6	47	94	50	100	00	00	38.72	<0.001
Place new born in supine position.	28	56	22	44	50	100	00	00	0.720	0.396
Inspect the cord closely during the first 24 hrs.(2 arteries & 1 big vein)	1	2	49	98	44	88	6	12	46.08	<0.001
Observe for bleeding, signs of infection as redness, bad odor, discharge and inflammation.	1	2	49	98	44	88	6	12	46.08	<0.001
Clean area at base in circular motion with alcohol cotton ball	1	2	49	98	44	88	6	12	46.08	<0.001
Put dry gauze around base of cord.	5	10	45	90	44	88	6	12	32.00	<0.001
Wipe the top of the cord in circular motion with alcohol cotton ball.	4	8	46	92	44	88	6	12	35.28	<0.001
Squeeze cotton with alcohol over the tip of the cord.	4	8	46	92	44	88	6	12	35.28	<0.001
Remove circular gauze.	4	8	46	92	46	92	4	8	35.28	<0.001
Remove all equipment.	13	26	37	74	46	92	4	8	35.28	<0.001
Wash hands.	9	18	41	82	48	96	2	4	42.32	<0.001
Mean± SD	1.7±1.6				11.04±2.46					

Table 3. Percentage distribution of postnatal mothers pre and post-practice with female new born regarding diaper care (N=38)

Steps	Pre-practice				Post-practice				Chi-square	
	Correct		Incorrect		Correct		Incorrect		X ²	P
	No	%	No	%	No	%	No	%		
Wash hands with soap and water.	18	47.4	20	52.6	38	100	00	00	0.105	0.746
Prepare all needed equipment's (clean diaper, zinc oxide, warm water, wash clothes)	00	00	38	100	36	94.7	2	5.3	30.42	<0.001
Check the water temperature by wrist or elbow joint.	11	28.9	27	71.1	38	100	00	00	6.737	0.007
Put the baby on a mat.	9	23.7	29	76.3	38	100	00	00	10.526	<0.001
Wipe off the feces with the corner of the unclean diaper.	5	13.2	33	86.8	36	94.7	2	5.3	20.632	<0.001
Fold the diaper down under the baby's legs.	13	34.2	25	65.8	38	100	00	00	3.789	0.052
Wipe away feces with a clean cotton or wash cloth.	4	10.5	34	89.5	36	94.7	2	5.3	23.68	<0.001
Using a moist baby clean wash cloth in one direction from up to down, far to near.	4	10.5	34	89.5	36	94.7	2	5.3	23.68	<0.001
Clean With clean cotton or wash cloth inside all the creases at the top of her legs.	6	15.8	32	84.2	36	94.7	2	5.3	17.789	<0.001
Wiping down ward and away from the baby.	6	15.8	32	84.2	30	100	00	00	17.789	<0.001

Steps	Pre-practice				Post-practice				Chi-square	
	Correct		Incorrect		Correct		Incorrect		X ²	P
	No	%	No	%	No	%	No	%		
Lift her legs up with a finger gently between her ankles	8	21.1	30	78.9	36	94.7	2	5.3	12.737	<0.001
Wipe the vulva, labia from up to down.	10	26.3	28	73.7	36	94.7	2	5.3	8.526	<0.001
Squeeze clean water to clean thoroughly all creases from front to back.	4	10.5	34	89.5	38	100	00	00	23.684	<0.001
Wipe anus then buttocks until completely cleaned.	4	10.5	34	89.5	36	94.7	2	5.3	23.684	<0.001
Dry anus & buttocks thoroughly.	8	21.1	30	78.9	38	100	00	00	12.737	<0.001
Remove the unclean diaper.	10	26.3	28	73.7	38	100	00	00	8.526	0.004
Place the new clean diaper under the infant's buttocks and sides in between his legs.	12	31.5	26	68.5	38	100	00	00	5.158	0.023
Apply zinc oxide ointment or baby lotion.	6	15.8	32	84.2	38	100	00	00	17.789	<0.001
Bring diaper up over abdomen, place front part of diaper next to baby's skin bring back of diaper over front tuck it.	2	5.3	36	94.7	38	100	00	00	30.421	<0.001
Being careful to place your finger between the baby legs and the diaper.	8	21.1	30	73.9	38	100	00	00	12.737	<0.001
Fold diaper so that it does not cover the cord stump	8	21.1	30	73.9	38	100	00	00	12.737	<0.001
Close the new diaper.	12	31.5	26	68.5	38	100	00	00	10.526	<0.001
Clean, return equipment's.	10	26.3	28	73.7	38	100	00	00	8.526	0.004
Mean± SD	4.71±5.47				22.63±0.82					

Table 4. Percentage distribution of postnatal mothers pre and post-practice with male new born regarding diaper care (n=12)

Steps	Pre-practice				Post-practice				Chi-square	
	Correct		Incorrect		Correct		Incorrect		X ²	P
	No	%	No	%	No	%	No	%		
Wash hands with soap and water.	4	33.3	8	66.7	12	100	00	00	1.333	0.248
Prepare all needed equipment's (clean diaper, zinc oxide, warm water, wash clothes)	4	33.3	8	66.7	10	83.3	2	16.7	1.333	0.248
Check the water temperature by wrist or elbow joint.	4	33.3	8	66.7	12	100	00	00	1.333	0.248
Put the baby on a mat.	2	16.7	10	83.3	12	100	00	00	5.33	0.021
Wipe off the feces with the corner of the unclean diaper.	8	66.7	4	33.3	12	100	00	00	1.333	0.248
Fold the diaper down under the baby's legs.	4	33.3	8	66.7	12	100	00	100	1.333	0.248
Clean his penis squeeze clean water over head of the penis, wiping away from the body	2	16.7	10	83.3	12	100	00	00	5.33	0.021
Pull the fore-skin back gently for uncircumcised boy, clean it then replace the retracted skin.	2	16.7	10	83.3	12	100	00	00	5.33	0.021
Clean scrotum using wash cloth & warm water and dry it well.	00	00	12	100	10	83.3	2	16.7	5.33	0.021
Squeeze clean water to clean thoroughly all creases from front to back.	2	16.7	10	83.3	12	100	00	00	5.33	0.021
Wipe anus then buttocks until completely cleaned.	00	00	12	100	10	83.3	2	16.7	5.33	0.021
Dry anus & buttocks thoroughly.	2	16.7	10	83.3	10	83.3	2	16.7	5.33	0.021
Remove the unclean diaper.	2	16.7	10	83.3	12	100	00	00	5.33	0.021
Place the new clean diaper under the infant's buttocks and sides in between his legs.	2	16.7	10	83.3	12	100	00	00	5.33	0.021
Apply zinc oxide ointment or baby lotion.	00	00	12	100	10	83.3	2	16.7	5.33	0.021
Bring diaper up over abdomen, place front part of diaper next to baby's skin bring back of diaper over front tuck it.	2	16.7	10	83.3	12	100	00	00	5.33	0.021
Being careful to place your finger between the baby legs and the diaper.	00	00	12	100	10	83.3	2	16.7	5.33	0.021
Fold diaper so that it does not cover the cord stump	00	00	12	100	10	83.3	2	16.7	5.33	0.021
Close the new diaper.	4	33.3	8	66.7	12	100	00	00	1.333	0.248
Clean, return equipment's.	2	16.7	10	83.3	12	100	00	00	5.33	0.021
Mean± SD	3.25±1.65				19.33±1.15					

Table 3 demonstrates that the most of postnatal mothers had incorrect practice before the intervention, while the majority of them had correct practice after the intervention; there were statistically significant improvements in all steps of this procedure reaching 100% for more than one step. In total, pre- practice the mean score was 4.71±5.47 out of 23 compared to 22.63±0.82 post practice.

Table 4 illustrates that the most of postnatal mothers had incorrect practice before the intervention, while the

vast majority of them had correct practice after the intervention; there were statistically significant improvements in all steps of this procedure reaching 100% for more than one the step. In total, pre-practice the mean score is 3.25±1.65 out of 20 compared to 19.33±1.15 post practice.

Table 5 reveals that a highly statistical significant difference has been found between means of mothers practice as regards eye care, cord care and diaper care pre and post intervention as (p<0.0001).

Table 5. Comparison between mean of practices regarding the three selected new born care pre and post -practice

Newborn care practice	Pre-practice	Post-practice	Paired t-test	
	Mean± SD	Mean± SD	t	p-value
Eye care	1.54 ± 2.12	8.8±0.94	22.745	<0.0001
Cord care	1.7±1.6	11.04±2.46	22.367	<0.0001
Diaper care among female new born	4.71±5.47	22.63±0.82	19.217	<0.0001
Diaper care among male new born	3.25±1.65	19.33±1.15	21.069	<0.0001

Table 6. Comparison between level of postnatal mothers practices regarding the new born care in pre and post -practice

Newborn care practice	Level of practice								Two related sample test	
	Pre-practice				Pre-practice				z	p-value
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory			
	No.	%	No.	%	No.	%	No.	%		
Eye care	7	14	43	86	50	100	0	00	6.557	<0.0001
Cord care	1	2	49	98	46	92	4	8	6.708	<0.0001
Diaper care among female new born (n=38)	6	15.8	32	84.2	38	76	0	00	5.657	<0.0001
Diaper care among male new born (n=12)	0	00	12	100	12	100	0	00	3.464	<0.0001

Table 6 demonstrates a statistically significant increase in the percentage of mothers having total satisfactory practice of eye care from 14% before to 100 % after the intervention. Concerning cord care, a statistically significant increase in the percentage of mothers having total satisfactory practice from 2% before to 92 % after the intervention. Regarding diaper care among female newborns, a statistically significant improvements in the percentage of mothers having total satisfactory practice from 15.8% before to 76 % after the intervention while total satisfactory practice, for diaper care among male newborn from 00.0% before to 100 % after the intervention, there were highly statistically significant difference has been found between levels of practice between pre and post – practice as (p<0.0001).

Section III: Follow-up of the newborn after two weeks

Table 7 indicates the minority of newborns (6%) developed diaper redness, 2% developed eye problem (discharge) and 96% their cord sloughed off before the end of the two weeks while 4% had delayed cord slough off.

Table 7. Newborns selected health problems after two weeks from intervention (n=50)

Selected health problems	Present		Not present	
	No.	%	No.	%
Diaper redness (rash)	3	6	47	94
Eye problem (discharge)	1	2	49	98
Delay cord slough off	4	4	46	96

Section IV: Relations among variables

Using correlation analysis results indicated that there was no significant relation between postnatal mother’s personnel characteristics as age, residence & educational level and occurrence of newborn selected health problems (r = 0.123, 0.014, & 0.047 respectively) (p = 0.361, 0.923, & 0.745 respectively). Also, there was no statistically significant relation between postnatal mother’s residence, educational level and total mean score of practice (r = 0.016 & 0.090 respectively) (p = 0.913 & 0.536 respectively). On the other hand, there was a significant

correlation between mother’s age and total mean score of practice (r =-0.305 & p = 0.031). Regarding newborn characteristics and occurrence of newborn selected health problems, the results revealed no significant relation between newborn gender, gestational age, birth weight and occurrence of newborn selected health problems (r = 0.014, 0.105 & 0.039 respectively) (p = 0.923, 0.469 & 0.790 respectively).

4. Discussion

The current study the researchers attempted to investigate the effect of newborn-care practices for postnatal mothers. The study findings indicate inadequate practices among postnatal mothers related to newborns care after delivery in pre intervention results, while after the implementation of selected newborn care practices to these mothers proved to be effective in improving their practice, with no health problems among their newborns. This leads to acceptance of the set research hypotheses.

Regarding description of the sample, the results of the current study indicated that, The age of the mothers range was 18-34 year with a mean of 22.54± 3.62 years old, more than half of mothers was living in rural area while, more than one third living in urban area. In relation to level of education, more than half of mothers can read and write, one third had primary education, and the minority of mothers received secondary education. A recent study by Bhandari and Paudyal [12] assessed knowledge and practice of postnatal mothers on newborn care at hospital setting showed that majority of group belong to 20-27 years of age, and minority belong to age of 35 years and above. More than half of respondents reside at rural areas. Regarding educational status near half (46.7 %) of respondents have studied up to higher-Secondary level and minority (2.7 %) have got no education.

Regarding newborn characteristics, includes newborn gender, gestational age (GA) and birth weight. Nearly two thirds of the postnatal mothers’ delivered male newborn while, thirty six percent delivered female newborn. The birth weight of the newborn, majority weighed was 2-3.75 Kg. The study results were supported by Mohini

and Shetty [13] assessed the knowledge of mothers on home based neonatal care at selected area of rural Bangalore and reported that based on the gender of the newborn infants, Male new born infants were 59% and females were 41 %. The birth weight of newborn infants, majority weighed 2- 2.9kg and 16.8% weighed 3 to 4 kg.

It is noticed also that, the majority of the newborn their gestational age ranged 37-39 weeks and, 24% of them ranged between 40-42wks. In the same context, a study conducted by Tegene Andargie, Nega and Yimam [14] studied clinics in mother and child health newborn care practice and associated factors among mothers who gave birth within one year in Mandura District, Northwest Ethiopia and mentioned that most of the newborn gestational age had 37 weeks or more.

As regards to eye care, the majority of mothers had incorrect performance of eye care before the intervention. At the post intervention, there were statistically significant improvements in almost all steps of this procedure. On the same line, Kudachi, Prabhu and Angolkar [15] evaluate the impact of health education on knowledge of newborn care in India and reported that knowledge of newborn care as eye care, cord care, breast feeding among primigravida women increased significantly after providing health education.

Concerning mother's performance of cord care, the most of mothers had incorrect performance before the intervention, while the majority of them had correct performance after the intervention. The researchers attributed this result to lack of mothers preparation during prenatal period. Similar studies done by Shrestha, Gautam, and Silwal [16] who studied knowledge and practice of postnatal mother in newborn care reported poor cord care practices before the intervention and great improvement after intervention.

Concerning diaper care, it is noticed also that the most of mothers had incorrect performance before the intervention, while the majority of them had correct performance after the intervention. The study results were supported by Bala, Devi and Gomathi [17] who studied the effectiveness of an instructional teaching program on the knowledge of postnatal mothers regarding newborn care, and found that the overall knowledge regarding diaper care increased post intervention.

Also, the results revealed that a highly statistically significant difference has been found between means of mothers performance pre and post intervention as ($p < 0.0001$). These findings are matched with Senarath, Fernando, and Rodrigo [18] who studied the effect of training for care providers on practice of essential newborn care in hospitals in Sri Lanka and resulted in the proportion with any undesirable health events (as forgetting hand washing before handling the newborn) has declined from 32 to 21 per 223 newborns in the intervention group ($p > .05$) and from 20 to 17 per 223 newborns in the control group ($p > .05$).

Moreover, these findings are in agreement with that found by the study done by Peter Waiswa, Peterson, Tomson, and Pariyo [19] studied poor newborn care practices - a population based survey in eastern Uganda and the results concluded that to improve newborn survival, newborn care should be integrated into the current maternal and child interventions, and should be

implemented at both community and health facility level as part of a universal coverage strategy.

In this present study, significant improvement was found between means of mother's performance pre and post intervention related to the selected newborn care which is supported by study conducted in tertiary care hospital of Udupi district by Castalino, Nayak and D'Souza [20] evaluate knowledge and practices of postnatal mothers on new-born care and concluded that, comparing knowledge with practice regarding newborn care, practice looks better in many areas.

As regards total satisfactory performance, there were highly statistically significant difference has been found between levels of practice between pre and post – practice. This findings goes in line with Thairu and Pelto [21] who studied newborn care practices in Pemba Island (Tanzania) and their implications for newborn health and survival, illustrated that eighty percent of study participants had good knowledge on essential new born care and more than ninety percent had the good practice of essential new born care.

Regarding to development of newborns health problems after two weeks from intervention, the results showed that almost all of the newborn did not developed diaper or eye complication, These findings were very close to that is reported by Friedlander, Eichenfield, Leyden, Shu, and Spellman [22], who evaluated diaper dermatitis and provided optimal management strategies. They investigated the incidence rate, treatment practices, and the significance of etiologic factors associated with diaper dermatitis. Based on their findings, the authors agreed that diaper dermatitis could be managed better by keeping the diaper area dry and the skin intact, changing diapers frequently, cleansing gently, and using barrier protection. In addition, Adalat, Wall, and Goodyear [23] who explored the current practices related to the prevention and treatment of diaper complication specially dermatitis investigating 532 diaper-wearing patients in a large U.K. district general hospital, concluded that to help prevent diaper complication, the researchers recommended the following: parental education and support, a gentle cleansing routine, frequent diaper changes, and a thick application of barrier cream.

This study indicates the minority of newborns developed diaper redness, eye discharge; this could explained by that the postnatal mothers, may provide more attention to the selected newborn care practices also they had no delayed cord slough off. Moreover, empirical evidence and previously cited research literatures about umbilical cord antiseptics for preventing sepsis and death among newborns by Imdad et al., [24] who studied application of antiseptics on umbilical cord for preventing sepsis and death among newborns recommended that maintenance of clean and dry cord care will help in early slough off the cord and prevent infection. Additionally WHO [25] recommends the application of topical antiseptics to the cord stump where the risk of infection is high . In relation to timing of cord slough off, the results showed that almost all of the newborn their cord sloughed off before the end of the two weeks, These findings were very close to that is reported by Guala et al., [26] who compared different cord-care practices in full-term healthy newborns, and found that the time of umbilical cord separation, using alcohol, to be 14 ± 6 days. Generally

speaking, there is an urgent need to educate mothers and train health care providers including traditional birth attendants on newborn care.

Results indicated that there was no statistically significant relation between postnatal mother's residence, educational level and total mean score of practice. On the same line, Bhandari and Paudyal [12] assessed knowledge and practice of postnatal mothers on newborn care at hospital Setting and reported that there is no any association between practice about newborn care and education of the mothers . The proportions of practice of mothers residing in urban and rural are not significantly different.

Results revealed that, more than half of the study sample in the middle age (20<25) and there was a significant relation between mother's age and total mean score of practice. The study results were supported by Mohini and Shetty [13] and stated that good knowledge, attitude, and practice were associated with middle age postnatal mothers and the researcher recommended to provide comprehensive training related to newborn care to young mothers.

The results revealed that no significant relation between newborn gender, gestational age, birth weight and occurrence of newborn selected health problems. In the same context, a study conducted by Amolo , Irimu and Njai [27] assessed Knowledge of postnatal mothers on essential newborn care practices at the Kenyatta National Hospital and found that no association between newborn's gender ,age, weight and their health problems .

5. Conclusion and Recommendation

The current study results concluded that mothers who received the newborn-care practices had higher total mean score of practice than before and the majority of them had satisfactory level of practice regarding the care of the newborn infants. The results also concluded that most of newborn infants of the mothers who received the intervention not exposed to the occurrence of diaper rash, eye problems and their cord slough off within expected time. Postnatal mothers can gain skills related to newborn care through simple education associated with practical training. Therefore, educational intervention regarding neonatal care is required during the period of antenatal visit. The effect of such selected newborn care practices on the incidence of newborn morbidity needs further research.

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