"ASSESS THE EFFECTIVENESS OF SWADDLING ON PHYSIOLOGICAL AND NEUROBEHAVIORAL PARAMETERS AMONG THE NEONATES ADMITTED AT PRAVARA RURAL HOSPITAL, LONI (BK)"

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Abstract

Background: Swaddling was an almost universal child-care practice before the 18th century. In general, swaddled neonates shown improved neuromuscular development, less physiologic distress, better motor organization, and more self-regulatory ability and arouse less and sleep longer when they are swaddled. It can be helpful in regulating temperature but can also cause hyperthermia when misapplied. Although swaddling promotes the favourable supine position, the combination of swaddling with prone position increases the risk of sudden infant death syndrome, which makes it necessary to warn parents to stop swaddling if infants attempt to turn.

Material and Method: A experimental study was conducted to evaluate the Effect of swaddling on Physiological and Neurobehavioral parameters among the neonates admitted at Pravara Rural Hospital, Loni (Bk). The sample consisted of 15 new-borns of experimental group and 15 new-borns control group; sampling technique used for present study was purposive sampling technique. was used prepared to collect the data. Descriptive Inferential statistics were used to analyse the data according to objectives and hypothesis.

Results: The result of study found that the swaddling is effective to maintain physiological and neurobehavioral parameters in a normal range of neonates. Result of this study also conclude that, swaddling did not have any ill effect on physiological and neurobehavioral parameters. Neonates who received swaddling also did not develop any complications.

Conclusion: The major conclusion drawn from this study is that the swaddling was found to be effective in maintain the physiological and neurobehavioral parameters in a normal state among the neonates. This study concludes that swaddling was beneficial in maintaining the physiological and neurobehavioral parameters in a normal range of neonates than the neonates who did not received swaddling.

Key word: Effectiveness, Swaddling, Physiological parameters, Neurobehavioral parameters, Neonates.

INTRODUCTION

Swaddling, an almost universal child-care practice before the 18th century, is wrapping a neonate tightly with a blanket, pieces of cloth, or bands, to prevent free movement of their limbs. Swaddling has traditionally been thought to offer many benefits to new-born infants. This technique varies considerably, from the European way of wrapping the infant in bands to the swaddling practices of South America and countries of the former Soviet Union of tightly folding blankets or sheets around the baby. Swaddling is of considerable interest, because the use of this practice is widely spread in many different societies. The Holy Bible describes infants winded in cloths, and one of the earliest illustrations of swaddling is of the infant Jesus. Swaddling is used for both full term and preterm neonates, although the technique may need to be different depending on the neonate's age and needs.[1]

In Indian populations, sometimes a cradle or board is used to swaddle the infant on. Research in experimental settings demonstrates that swaddling influences the arousal function and promotes sleep and maintaining the physiological and neurobehavioral parameters to keep in normal range.[2]

Several studies on swaddling have examined the advantages and disadvantages of swaddling term infants. For example, term infants who were swaddled were aroused less while sleeping, slept longer, cried less, and were soothed when in pain. Swaddling can also recreate the fetal in-utero posture. There are also many studies that show the advantages of swaddling preterm infants. Van Sleuwen (2007), did a systematic review on the benefits of swaddling of preterm neonates and found that several studies support the findings that neonate who are swaddled have shown improved neuromuscular development, less physiologic distress, better motor organization, and more self-regulatory ability compared with those who were not swaddled. [3]

If swaddling is done improperly, however, it can pose some risk for babies. Therefore, it is important for parents or caregivers to be educated on proper swaddling practices such as swaddling neonate with their head free, without extra bedding, and preventing unnecessary tightness that can lead to injury around the chest, hips, and knees.[4]

In many countries such as Russia, Turkey, China, Central Asia, and South swaddling is still commonly practiced, and it is becoming increasingly popular in the Netherlands as an intervention for excessive crying in infants. In recent years there has been a resurgence of the use of swaddling in the United Kingdom, United States, and Netherlands because of the favourable effects the practice is having on neonate's behaviour. A few centuries ago swaddling was used in most societies of the north temperate and subarctic regions, in the Mediterranean and Middle East areas, in Asia and South America, and many other parts of the world. In 1971 almost 52% of 139 societies still used some form of infant restraint. In 2003 swaddling was still common in the Middle East. In parts of the world where humidity and temperature are high, such as Africa, swaddling can promote skin infections; as an alternative, children are carried in a sling, often with a minimum of clothing.' Swaddling already began to disappear in Europe before industrialization. One of the reasons for the decrease of swaddling is that in the 20th century it was confined to a few rural societies in eastern Europe.[5]

In this study I will analyse regarding swaddling of neonates that how it is effect on the physiological and neurobehavioral parameters of neonates including a discussion of the preamble of swaddling, information about health issues of neonate face, and the health benefits and risk of swaddling.

NEED FOR THE STUDY

Every pregnancy is a precious pregnancy for the mother. The birth of an infant is an event filled with wonder and joy for most of the families. (Jacinth Christy Joy, 2004). new-born babies are not mini – adults because they have anatomical and functional immaturity of various body organs at different stages of life. They rapidly develop life threating medical emergencies due their physiological instability, new-born babies are like flowers, they can rapidly wither following an acute illness but are endowed with tremendous recuperative capabilities and when tended with care, compassion and due concern for their physiological handicaps, they bloom back to life with equal case.[6]

Management is important because neonates have a higher risk of dying before their first birthday and other suffer from neurological and development problems. Good prognosis in

growth and development problems of such babies is purely dependant on the effectiveness of management.[7]

According to Indira Shekar Rao, 2002, survival of neonatal problems can be strengthened by training of personnel involved in health care delivery system, reorientation of medical education and strengthening of the neonatal units. It is universally accepted that improved survival of low birth weight can be successfully achieved by training education others and family members and home-based care. Bang Abhay, 2002 says that more than half of the child death could be prevented if a new module home based neonatal care is tried. Mothers are the natural custodian of the new-born who care for their babies with love, affection and with sense of commitment. They are the one who first notice any change in babies' condition or behaviour. But due to ignorance, they fail in their role and hence arises the need for sum education and support from health personnel. (Jacinth Christy Joy, 2004.) Ravikumar. M and Bhat B.V, 1995 conducted a study to find out early neonatal mortality in a tertiary care hospital and found that early neonatal mortality rate was 26.6/1000 live birth. In their study, they concluded that health education to the mother on new-born care would significantly reduce early neonatal death. According to Helen Yeo, 1992 the needs of the small require carefully management in order to maximize their potential both in present and future. Their needs encompass respiratory status, thermal environment, nutrition's, observation, skin integrity, positioning stimulation, parental environment.[8]

During my experience as nurse, has observed the recurrent readmission of neonatal illnesses due to infection and with other health problems. In observation it is also observed lack of confidence and knowledge in caring for such babies among the mothers and parental anxiety regarding prognosis of the child. The need for early discharge due to unaffordability of the parents, busy ward routine has barred the communication of management of ill neonates to the mother by any mean. The poor parental knowledge on management has resulted in poor child rearing practice, frequent hospitalization and an increase in mortality and morbidity rate. Costly neonatal care at tertiary level and unaffordability of the parents due to poor per capital income has necessitated the urged to prevent rehospitalisation through proper health education programme. Because of these facts I as an investigator sensitized that there is need of study to assess effectiveness of swaddling on physiological and neurobehavioral responses among the neonates to build a healthy life of child.

AIM OF THE STUDY: Assess the effectiveness of Swaddling on physiological and neurobehavioral parameters among the neonates admitted in Pravara Rural Hospital Loni (Bk)

OBJECTIVES:

1. Assess effectiveness of swaddling on physiological and neurobehavioral parameters among neonates.

2. Compare the effectiveness of physiological and neurobehavioral parameters.

3. Associate neurobehavioral parameters with selected demographic variables.

HYPOTHESES

Ho1- There will be no significant effect of swaddling on physiological and neurobehavioral parameters among the neonates.

H1- There will be significant effect of swaddling on physiological and neurobehavioral parameters among the neonates.

H02- There will be no significant association of neurobehavioral parameters with selected demographic variable

H2- There will be significant association of neurobehavioral parameters with selected demographic variable

RESEARCH DESIGN: As the research aimed at assessing the effectiveness of swaddling on physiological and neurobehavioral parameters among neonate the research design used for the study was quasi experimental study where pre-test and post-test design with control group approach.

SUBJECTS AND METHODS

RESEARCH SETTING: The present study was conducted in the PNC ward of Pravara Rural Hospital, Loni

SUBJECTS: The sample size for present study was 30 neonates born at Pravara Rural Hospital, Loni BK.

STATISTICAL ANALYSIS: The data were computerized and verified using the SPSS (statistical package for social science) version 16.0 to perform tabulation and statistical analysis. Qualitative variables were described in frequency and percentages, while quantitative variables were described by mean and standard deviation.

RESULTS The data was analysed and presented in the following sections:

Section A: Description of Socio demographic data of neonate and parents.

Part I. Description of Socio demographic data of neonate

Part II. Description of Socio demographic data of neonate's parent

Section B: Assessment of physiological and neurobehavioral parameters in neonate

Part I. Assessment of physiological parameters of neonates

Part II. Assessment of neurobehavioral parameters of neonates

Section C: Comparison of effectiveness of physiological and neurobehavioral parameters in neonate

Part I. Comparison of effectiveness of physiological parameters in control and experimental group

Part II. Comparison of effectiveness of neurobehavioral parameters in control and experimental group

Section D: Effectiveness of swaddling on neurobehavioral parameters with t test value

Section E: Association of neurobehavioral parameters with selected demographic variables

Section A

Part I: Description of Socio demographic profile of neonate and parents**.**

Description of socio demographic data of new-borns

1. It was found that both control and experimental group were belonging to early neonates (100%) None of them were belongs to late neonates in control and experimental group (0%)

2. It was found in control group, 60% of them were males and (40%) of them were females and in experimental group, (54%) of them were females and (46%) of them were males.

3. It was found in control group majority (100%) of neonates were full term, however in experimental group majority (86%) neonates were belonging to full term gestational period and (7%) neonates were belonging to preterm and post term gestational period

4. It was found that in control group (80%) of neonates were taking mother milk and (20%) of neonates receiving the EBM. However, in experimental group (86%) of neonates were taking mother milk and (14%) of neonates were receiving EBM

5. It shows in control group majority (66%) of neonates were unimmunized up to age, (27%) of them were partially immunized up to age and (7%) of them were fully immunized up to age. In experimental group majority (54%) of neonates were partially immunized up to age, (26%) of them were fully immunized up to age and (20%) of them were unimmunized up to age.

6. It was found in control group majority (53%) of neonates were 2nd child of their mother and (47%) of them were 1st child of their mother. In experimental group, (47%) of neonates were 1st and 2nd child of their mother and (6%) of theme were 3rd child of their mother.

Part II. Description of Socio demographic data of neonate's parent

1. It was found in control group majority (60%) of the mothers had age 18-22 years, (34%) of them had age 27-28 years and (6%) of them had age 23-26 years. In experimental group majority (53%) of the mothers had age 23-26 years, (40%) of them had age 18-22 years and (7%) of them had age 27-30 years.

2. In this study it was found that in both control and experimental group's mother were belongs to married life (100%). None of them were belongs to widow/widower, divorced/separated in control and experimental group (0%)

3. It was found in control group majority (74%) were nuclear types of family and remaining (26%) were belongs to joint family. However, in experimental group majority (60%) were belongs to nuclear family and remaining (40%) were belongs to joint family. So, it interprets that nuclear family neonates were mostly participated in the study.

4. It is found in control (34%) of them had secondary education, (33%) of them had primary education, (20%) of them was illiterate and (13%) of them were graduate/postgraduate. However, in experimental group (33%) of them had secondary education, (27%) of them had primary education, (20%) of them had graduate/postgraduate and (20%) of them were illiterate.

5. It was found that in control group majority (40%) of them was agriculture, (27%) of them were private employee, (26%) of them were any other employees and (7%) of them were some business occupation. In experimental group it was found that (53%) of them were agriculture, (27%) of them had private employee, (13%) of them were had some other occupation and (7%) of them was had business.

Section B: Assessment of physiological and neurobehavioral parameters in neonate of control and experimental group

Part I: Assessment of physiological parameters of neonate

i. Assessment of physiological parameters of neonate in control group of pre-observational value

Table No I

Control group pre-observation value of Physiological Parameters

(n-15)

SN	Control group pre-observation value		
	Physiological Parameters		
1	Temperature		
	Hypothermia	Normal	Hyperthermia
Percent (%)	4.44	95.55	0
2	Heart Rate		
	Bradycardia	Normal	Tachycardia
Percent (%)	0	95.55	4.44
3	Respiration Rate		
	Bradypnea	Normal	Tachypnoea
Percent (%)	8.88	91.11	0
4	SpO$_2$		
	Hypoxemia	Normal	Hyperaemia
Percent (%)	0	100	0
5	Blood Pressure		
	Hypotension	Normal	Hypertension
Percent (%)	4.44	95.55	0

Above table of control group pre-observational value depicts that in Temperature majority were normal (95.55%). In Heart rate majority were normal (95.55%). In respiration rate majority were normal (91.11%). In SpO$_2$ majority were normal (100%) and in Blood Pressure majority were normal (95.11%).

ii. Assessment of physiological parameters of neonate in experimental group of pre-observational value

Table No II

Experimental group pre-observational value of Physiological Parameters

(n-15)

SN	Experimental group pre-observational value		
	Physiological Parameters		
1	Temperature		
	Hypothermia	Normal	Hyperthermia
Percent (%)	0	95.5	4.44
2	Heart Rate		
	Bradycardia	Normal	Tachycardia
Percent (%)	2.22	97.77	0
3	Respiration Rate		
	Bradypnea	Normal	Tachypnoea
Percent (%)	2.22	97.44	0
4	SpO$_2$		
	Hypoxemia	Normal	Hyperaemia
Percent (%)	0	100	0
5	Blood Pressure		
	Hypotension	Normal	Hypertension
Percent (%)	8.88	91.11	0

Above table of control group pre-observational value depicts that in Temperature majority were normal (95.5%). In Heart rate majority were normal (97.77%). In respiration rate majority were normal (97.44%). In SpO$_2$ majority were normal (100%) and in Blood Pressure majority were normal (91.11%).

Part II. Assessment of neurobehavioral parameters of neonate.

i. Assessment of neurobehavioral parameters of neonate in control group of pre-observational value system wise

Table No III

Control group pre-observational value of neurobehavioral parameters (Autonomic System)

(n-15)

Neurobehavioral Parameters	Control group pre-observational value		
	Score		
	0	**1**	**2**
Tremulousness	15	0	0
Startle	15	0	0
Cost of Attention	0	15	0
Liability of Skin Colour	15	0	0
Percentage (%)	75	25	0

Above table depicts that under autonomic system in control group pre-observational value majority (75%) were with no neurobehavioral response (Score 0), (25%) were with average behavioural response (Score 1) and none of them were under normal behavioural response (Score 2).

Table No IV

Control group pre-observational value neurobehavioral parameters (Motor system)

(n-15)

Neurobehavioral Parameters	Control group pre-observational value		
	Score		
	0	**1**	**2**
Sucking	9	6	0
Rooting	0	15	0
Palmer Grasp	1	14	0
Planter Grasp	13	2	0
Standing	15	0	0
Stepping	15	0	0
Incurvation	15	0	0
Crawling	15	0	0
Motor Tone	15	0	0
Motor Maturity	15	0	0
Pull to Sit	15	0	0

Percentage (%)	77.53	22.47	0

Above table depicts that under motor system in control group pre-observational value majority (77.53%) were with no neurobehavioral response (Score 0), (22.47%) were with average behavioural response (Score 1) and none of them were under normal behavioural response (Score 2).

Table No V

Control group pre-observational value of neurobehavioral parameters (State System)

(n-15)

Neurobehavioral Parameters	Control group pre-observational value		
	Score		
	0	**1**	**2**
Habituation	15	0	0
Liability of State	15	0	0
Peak of Excitement	15	0	0
Rapidity to Build Up	15	0	0
General Irritability	15	0	0
Self-Quieting	15	0	0
Hand to Mouth	15	0	0
Consoability	15	0	0
Percentage (%)	100	0	0

Above table depicts that under state system in control group pre-observational value majority (100%) were with no neurobehavioral response (Score 0), (0%) were with average behavioural response (Score 1) and normal behavioural response (Score 2).

Table No VI

Control group pre-observational value of neurobehavioral parameters (Social System)

(n-15)

Neurobehavioral Parameters	Control group pre-observational value		
	Score		
	0	**1**	**2**
Visual Orientation	15	0	0
Auditory Orientation	15	0	0
Alertness	15	0	0
Facial Expression	15	0	0
Percentage (%)	100	0	0

Above table depicts that under social system in control group pre-observational value majority (100%) were with no neurobehavioral response (Score 0), (0%) were with average behavioural response (Score 1) and normal behavioural response (Score 2).

ii. Assessment of neurobehavioral parameters of neonate in experimental group of pre-observational value system wise

Table No VII

Experimental group pre-observational value of neurobehavioral parameters (Autonomic System)
(n-15)

Neurobehavioral Parameters	Experimental group pre-observational value		
	Score		
	0	1	2
Tremulousness	6	9	0
Startle	6	9	0
Cost of Attention	1	14	0
Liability of Skin Colour	0	15	0
Percentage (%)	21.66	78.33	0

Above table depicts that under autonomic system in experimental group pre-observational value majority (78.33%) were with average neurobehavioral response (Score 1), (21.66%) were with no behavioural response (Score 0) and (0%) were with normal behavioural response (Score 2).

Table No VIII

Experimental group pre-observational value of neurobehavioral parameters (Motor system)
(n-15)

Neurobehavioral Parameters	Experimental group pre-observational value		
	Score		
	0	1	2
Sucking	1	13	1
Rooting	0	15	0
Palmer Grasp	0	11	4
Planter Grasp	11	4	0
Standing	15	0	0
Stepping	15	0	0
Incurvation	15	0	0
Crawling	15	0	0
Motor Tone	6	9	0
Motor Maturity	4	11	0
Pull to Sit	15	0	0
Percentage (%)	58.73	38.13	3

Above table depicts that under motor system in experimental group pre-observational value majority (58.73%) were with no neurobehavioral response (Score 0), (38.13%) were with average behavioural response (Score 1) and (3%) were with normal behavioural response (Score 2).

Table No IX

Experimental group pre-observational value of neurobehavioral parameters (State System)

(n-15)

Neurobehavioral Parameters	Experimental group pre-observational value		
	Score		
	0	1	2
Habituation	4	11	0
Liability of State	15	0	0
Peak of Excitement	3	12	0
Rapidity to Build Up	15	0	0
General Irritability	2	13	0
Self-Quieting	7	8	0
Hand to Mouth	0	15	0
Consoability	0	15	0
Percentage (%)	38.33	61.66	0

Above table depicts that under state system in experimental group pre-observational value majority (61.66%) were with average neurobehavioral response (Score 1), (38.33%) were with no behavioural response (Score 1) and (0%) were with

Table No X

Experimental group pre-observational value neurobehavioral parameters (Social System)

(n-15)

Neurobehavioral Parameters	Experimental group pre-observational value		
	Score		
	0	1	2
Visual Orientation	8	7	0
Auditory Orientation	3	12	0
Alertness	0	15	0
Facial Expression	3	12	0
Percentage (%)	23.33	76.66	0

Above table depicts that under social system in experimental group pre-observational value majority (76.66%) were with average neurobehavioral response (Score 1), (23.33%) were with no neurobehavioral response (Score 0) and (0%) were with normal neurobehavioral response (Score 2).

Section C: Comparison of effectiveness of post observational value of physiological and neurobehavioral parameters in neonate

Part I. Comparison of effectiveness of post observational value of physiological parameters in control and experimental group

Table No XI

Control group post observational value and Experimental group post observational value of Physiological Parameters

(n-30)

SN	Control group post observational value			Experimental group post observational value		
	Physiological Parameters			**Physiological Parameters**		
1	Temperature			Temperature		
	Hypothermia	Normal	Hyperthermia	Hypothermia	Normal	Hyperthermia
(%)	13	80	6.66	0	100	0
2	Heart Rate			Heart Rate		
	Bradycardia	Normal	Tachycardia	Bradycardia	Normal	Tachycardia
(%)	0	86.66	13.33	0	88.88	11.11
3	Respiration Rate			Respiration Rate		
	Bradypnea	Normal	Tachypnoea	Bradypnea	Normal	Tachypnoea
(%)	13	86.66	1.22	4.44	93.33	2.22
4	SpO_2			SpO_2		
	Hypoxemia	Normal	Hyperoxemia	Hypoxemia	Normal	Hyperoxemia
(%)	0	100	0	0	100	0
5	Blood Pressure			Blood Pressure		
	Hypotension	Normal	Hypertension	Hypotension	Normal	Hypertension
(%)	15	77.77	6.66	2.22	97.77	0

Above table depicts that in temperature under control group post-test value normality is significantly increased from 80% to 100% in experimental group post-test.

In heart rate control group normality post-test value (86.66%) has slightly increased to (88.88%) in experimental group post test

In respiration rate control group normality post-test value (86.66%) has significantly increases to (93.33%) in experimental group post-test.

In SpO_2both control and experimental group post-test value are same (100%). There is no any change in normality value.

In Blood Pressure control group normality post-test value (77.77%) has significantly increased to (97.77%) in experimental post-test value.

So, it interprets that swaddling is more effective in experimental group to keep physiological parameters in normal range.

Part II. Comparison of effectiveness of post observational value of neurobehavioral parameters in control and experimental group system wise

Table no XII

Control Group post observational value and Experimental Group post observational value of neurobehavioral parameters (Autonomic System)

Neurobehavioral Parameters	Control Group post observational value			Experimental Group post observational value		
	Score			Score		
	0	1	2	0	1	2
Tremulousness	0	15	0	0	0	15
Startle	0	15	0	0	1	14
Cost of Attention	0	7	8	0	1	14
Liability of Skin Colour	0	11	4	0	0	15
Percentage (%)	0	80	20	0	3.33	96.66

Above table depicts that under autonomic system in control group post observational value majority (80%) were with average neurobehavioral response (score 1), (20%) were with normal neurobehavioral response (Score 2), (0%) were with no neurobehavioral response (Score 0)

In experimental group post observational value majority (96.66%) were with normal neurobehavioral response (Score 1), (3.33%) were with average neurobehavioral response (Score 1), (0%) were with no neurobehavioral response (Score 0)

So, it interprets that in Autonomic system swaddling is effective to maintain the neurobehavioral parameters in normal level.

Table No XIII

Control Group Post observational value and Experimental Group post observational value of neurobehavioral parameters (Motor system)

Neurobehavioral Parameters	Control Group Post observational value			Experimental Group post observational value		
	Score			Score		
	0	1	2	0	1	2
Sucking	0	15	0	0	0	15
Rooting	0	4	11	0	0	15
Palmer Grasp	0	1	14	0	0	15
Planter Grasp	0	15	0	1	7	7
Standing	15	0	0	15	0	0
Stepping	15	0	0	15	0	0
Incurvation	5	10	0	0	15	0
Crawling	3	12	0	0	15	0
Motor Tone	0	14	1	0	3	12
Motor Maturity	0	14	1	0	0	15
Pull to Sit	15	0	0	15	0	0
Percentage (%)	32.06	51.51	16.36	27.87	24.24	47.86

Above table depicts that under motor system in control group post observational value majority (51.51%) were with average neurobehavioral response (score 1), (32.06%) were with no neurobehavioral response (Score 0), (16%) were with normal neurobehavioral response (Score 2)

In experimental group post observational value majority (47.86%) were with normal neurobehavioral response (Score 2), (27.87%) were with no neurobehavioral response (Score 0), (24.24%) were with average neurobehavioral response (Score 1)

So, it interprets that in motor system swaddling is effective to maintain the neurobehavioral parameters in normal level.

Table No XIV

Control Group Post observational value and Experimental Group Post observational value of neurobehavioral parameters (State system)

(n-30)

Neurobehavioral Parameters	Control Group Post observational value			Experimental Group Post observational value		
	Score			Score		
	0	1	2	0	1	2
Habituation	0	15	0	0	0	15
Liability of State	15	0	0	15	0	0
Peak of Excitement	0	15	0	0	0	15
Rapidity to Build Up	0	15	0	0	12	3
General Irritability	0	15	0	0	0	15
Self-Quieting	2	13	0	0	3	12
Hand to Mouth	0	7	8	0	0	15
Consoability	1	14	0	0	0	15
Percentage (%)	15	78.33	6.66	12.5	12.5	75

Above table depicts that under state system in control group post observational value majority (78/.33%) were with average neurobehavioral response (score 1), (15%) were with no neurobehavioral response (Score 0), (6.66%) were with normal neurobehavioral response (Score 2)

In experimental group post observational value majority (75%) were with normal neurobehavioral response (Score 2), (12.5%) both were with no neurobehavioral response (Score 0) and average neurobehavioral response (Score 1)

So, it interprets that in state system swaddling is effective to maintain the neurobehavioral parameters in normal level.

Table No XV

Control Group Post observational value and Experimental Group Post observational value of neurobehavioral parameters (Social system)

Neurobehavioral Parameters	Control Group Post observational value			Experimental Group Post observational value		
	Score			Score		
	0	1	2	0	1	2
Visual Orientation	0	15	0	0	0	15
Auditory Orientation	0	15	0	0	0	15
Alertness	0	15	0	0	0	15
Facial Expression	0	15	0	0	0	15
Percentage (%)	0	100	0	0	0	100

Above table depicts that under social system in control group post observational value majority (100%) were with average neurobehavioral response (score 1), (0%) were with no neurobehavioral response (Score 0), and with normal neurobehavioral response (Score 2)

In experimental group post observational value majority (100%) were with normal neurobehavioral response (Score 2), (0%) were with no neurobehavioral response (Score 0), (24.24%) and with average neurobehavioral response (Score 1)

So, it interprets that in social system swaddling is effective to maintain the neurobehavioral parameters in normal level.

Section D: Effectiveness of swaddling on neurobehavioral parameters

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Table No XVI

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Effectiveness of swaddling on neurobehavioral parameters with t test value

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(n=30)

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SN	Parameters	t calculated	Significant or not
1	Neurobehavioral parameters	5.445	Significant

(df=28)   **Table value 2.048**   (P > 0.05)

Above table depicts that the t test value of post observation value of control group was computed with post observation value of experimental group. The value of experimental group in post-test was significantly higher for neurobehavioral parameters. It indicates there is statistical effectiveness of swaddling on neurobehavioral parameters and swaddling is effective in maintaining normal neurobehavioral parameters in neonates.

Section E: Association of neurobehavioral parameters with selected demographic variables

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Table no. XVII

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Association of neurobehavioral parameters with selected demographic variables chi-squared test

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(n=30)

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SN	Demographic variable	χ^2 calculated	Significant or not
1	Age of neonates	11.26	Significant
2	Gender	4.83	Non-Significant
3	Period of Gestation	8.27	Significant

(df =2)   **Table value 5.99**   (P > 0.05)

This table depicts that demographic variables like Age of neonates and Period of gestation are significant and Gender is non-significant with neurobehavioral parameters.

So, there is significant association between neurobehavioral parameters with selected demographic variable

DISCUSSION

Section A: Description of socio demographic data of neonates

High percentage experimental group and control group all (100%) of new-borns were belongs to early neonates (fig No. 1) It was sink with the study conducted by Priya S Megha S. who also noted that majority (86%) group includes neonates belong early neonates.[9]

Majority (60%) of neonates were male and 40% were female in control and experimental group majority (54%) were female and (46%) were male. (fig No .2) It was supported by Christopher D, that among the samples of his study (55%) were male and (45%) were female in control group.[10]

High percentage (86%) were belongs to full term gestational period and (7%) were belongs preterm gestational period in control group, in experimental group all (100%) of new-born's belongs to full term gestational period, and none of them were belongs post term gestational period (fig No. 3). It was correlated with study conducted by Sudesh S, Giris S who also found that (95%) in the group of 37-41 week of gestational age.[11]

Major in control (80%) of new-born's belongs to taking mother milk and (20%) belongs to taking EBM, in experimental group (86%) of new-born's belongs to taking mother milk and (14%) of them were belongs to taking EBM (Fig No. 4). It was sink with the study conducted by Hauck FR who also found majority (90%) in study with mother milk taking neonates.[12]

In control group majority (66%) of new-born's immunization status is incomplete up to the age, (27%) then (7%) were having complete and partially complete immunization status and (7%) of new-born's immunization status is complete up to the age, in experimental group majority (54%) were belong to partially complete immunization status (26%) were complete and (20%) were incomplete up to the age (Fig. 5) It was sink with the study conducted by Deep B, Surya B who noted majority (55%) of new-born's immunization status is in complete up to the age because of the rural community setting of the study.[13]

In control group majority (53%) of neonate were with 2nd no of birth order and (47%) of neonate were with 1st no of birth order is there. In 3rd no of birth order there is no neonates in this study. In experimental group (53%) of neonates were with 2nd no of birth order and (47%) of neonates were with 1st no of birth order (fig No 6). It was correlated with the study conducted by Karbasi SA, GolestanM, Fallah R et al. who noted that majority (50%) of were with 1st no of birth order in experimental group.[14]

In both control and experimental group majority (60%) of mothers of neonates belong to 18-22 years of age (Fig. No. 7). It was correlated with the study conducted by Karbasi SA, Golestan, M, Fallah R et al. who noted that majority (74%) of mothers of neonates belong to 18-22 years of age[14]

In both control and experimental group (100%) of mothers were married (Fig. No. 8). Similarly, B.V.van Sleumen and MP. L Hoir also found that majority (100%) of mothers were married in his study at turkisthan country.[15]

Higher percentage (74%) of new-borns belong to nuclear family while in experimental group (60%) of new-borns belong to nuclear family (Fig. No. 9). It was contradictory with the study conducted by Saeadi R, Ghorbani Z, Shapouri A who found that majority (91%) of new-borns belong to nuclear type of family because of variability of the population under study.[16]

In both control and experimental group (20%) of new-born parents were illiterate and in control group 33% of parents had primary education, in experimental group (27%) of parents had primary (Fig. No. 10). Similarly, Kumar J, Upadhyay A, Dwivedi AK et al. also found that majority (35%) of new-born's parent were illiterate in control group because of rural setting of the study.[17]

Majority (53%) of new-born's parents were doing agriculture in control group and (40%) parents doing agriculture in experimental group. Similarly, Kumar J, Upadhyay A, Dwivedi AK et al. also found that majority (55%) of new-born's parent were doing agriculture because of rural setting of the study.[17]

Section B: Assessments of swaddling on physiological and neurobehavioral parameters among the neonates.

I. Assessments of swaddling on physiological parameters among neonates

Total percentage in control group pre observational value under normal range for temperature were (95.55%) and in abnormal range were (4.44%), for heart rate normal (95.55%)and abnormal (4.44%), for respiration rate normal (91.11%) and abnormal (8.11%), for SpO$_2$ normal (100%) and for blood pressure it was (95.55%) and abnormal (4.44%) (Table No 1).This was similarly coincidental with the study done by Narangerel G, Pollock J, Manaseki-Holland S, Henderson J.. In this study found that in control group for temperature (5%) of neonates were in hypothermia, for respiration (10%) of neonates were in bradypnea for heart rate (8%) of neonates were in bradycardia abnormal condition. So, there is similarity in the both two study in assessment physiological parameters.[18]

II. Effectiveness of swaddling on neurobehavioral parameters among the neonates

In control group neurobehavioral response under autonomic system were absent (75%) (Score 0), neurobehavioral response under motor system was absent (77.53%) (Score 0), neurobehavioral response under state system was (100%) (Score 0), neurobehavioral response under social system was absent (100%) (Score 0) (Table No. VI). It was similarly correlated with the findings of the study performed by Pitre S who noted that the neurobehavioral responses were absent such as Orientation, range of state, regulation of state, & autonomic stability at follow-up. Habituation & reflex were absent in control group.[16]

Section C: Comparison of assessment of physiological and neurobehavioral parameters among the neonates

I. Comparison of assessment of physiological parameters among the neonates

In experimental group temperature normal range was (100%) from heart rate normal range was (88%) and abnormal range was (11.11%) for respiration rate normal range was 93.33% and abnormal range was (6.66%) for SpO$_2$ normal range was (100%) and for blood pressure it was (97.77%) and abnormal was (2.22%) (Table No I). This was similarly coincidental with the study findings of The Benefits of

Swaddling on Infants performed by Nycole De La Torre who noted that in his experimental group temperature, heart rate, respiration rate these physiological parameters were mostly effective to maintain in normal level after swaddling.[19]

II. Comparison of assessment of neurobehavioral parameters among the neonates

In experimental group neurobehavioral response under autonomic system were present (96.66%) (Score 2) (Table II), neurobehavioral response under motor system was present (47.86%) (Score 2) (Table III), neurobehavioral response under state system was (75%) (Score 2) (Table IV), neurobehavioral response under social system was absent (100%) (Score 2) (Table No. V). It was similarly correlate with the findings of study The Benefits of Swaddling on Infants performed by Nycole De La Torre who noted that improvement in all lustres such as Orientation, range of state, regulation of state, & autonomic stability at follow-up. Habituation & reflex cluster showed improvement after the swaddling.[19]

Section D: Effectiveness of swaddling on neurobehavioral parameters with t test value (Testing of hypotheses)

Paired' test was calculated to analyse the effectiveness of swaddling on neurobehavioral parameters response of the neonates. A significant difference was found between neurobehavioral parameters of control and experimental group ('t' value 5.445) (Table No. I). It was consistent with the study of Mathai S, Fernande A who found calculated 't' value was 8.04 indicating effectiveness of swaddling on neurobehavioral parameters of neonates.[20]

Section E: Association of selected demographic variables with neurobehavioral parameters among neonates

The findings of the chi square test revealed that there was statistically significant association between age of neonate in days ($\chi 2 =11.26$), Period of gestation ($\chi 2=8.27$) and neurobehavioral parameters of the neonates (Table No. I). These findings were similar with the findings of the study conducted by Zahra, Balian who found significant association between age of neonate ($\chi 2=12.25$) and period of gestation ($\chi 2=8.68$).[21]

CONCLUSION

The major conclusion drawn from this study is that the swaddling was found to be effective in maintaining normal physiological and neurobehavioral parameters among neonates. Findings of this study also conclude that, swaddling did not have any ill effect on maintenance physiological and neurobehavioral parameters. Neonates who received swaddling also did not develop any complications

Implications for Nursing:

The findings of the study are significant and relevant in the area of nursing profession. The implication of this study could be discussed under nursing practice, nursing education, nursing administration and nursing research.

Nursing practice

The role of nurses is constantly changing. These changes are the result of evolving concepts of wellness and illness. Today the emphasis has broadened to include the promotion of health and prevention of illness. Nurses play an important role in comprehensive assessment of the neonatal care and associated problems which can minimize the risk of low birth weight. Nurses must have adequate preparation and training on swaddling which will help them to reduce the risk of low birth weight among neonates.

Nurses themselves need to be equipped with advanced knowledge to become involved in providing necessary services. An implication for nursing practices derived from this study is that swaddling will help in maintaining physiological and neurobehavioral parameters in normal range.

Nursing education:

The practical knowledge of nurses depends on the education they receive. So, the nursing education should prepare the nurses to realize their responsibility as a nurse educator.

To enhance the knowledge on management of physiological and neurobehavioral parameters among neonates, it is an important aspect of basic education programs in nursing. The primary task of nursing education would be to intervene in hospital in-patient and out-patient departments, rehabilitation centres. Nurse educators will emphasize on evidence-based practices while imparting nursing knowledge to nursing students.

Nursing research:

Extensive research studies can be undertaken in different fields to quantify the magnitude of deficiency of knowledge regarding swaddling on physiological and neurobehavioral parameters among neonates. Evidence-based nursing care can be implemented based on the research findings. Study results will provide clues to nursing researcher for further studies

RECOMMENDATION:

Based on the findings of the study following recommendation have been made for the study:

1. The study can be replicated with larger sample to generalize the findings.

2. A study could be conducted in different hospital to find the effectiveness of swaddling on physiological and neurobehavioral parameters among neonates.

3. A study may be conducted to find out the effectiveness of swaddling and KMC in experimental and control group.

4. A comparative study may be conducted on effectiveness of swaddling on changes in weight and behavioural responses among low birth weight new-born's in Urban and Rural areas.

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