Article

Effect of Nesting on Sleep Quality among Newborn at Selected Villages, Puducherry

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Abstract: BACKGROUND OF THE STUDY: Babies born before their due dates are physiologically unstable and physically underdeveloped. Environmental stimuli are intolerable to them. They frequently lack proper muscular tone and run the danger of acquiring an aberrant posture since they are immature. Premature newborns benefit from nesting because it helps them stay in place, feel comfortable, and have postural, behavioral, and physiological stability. Sleep plays a critical role in a newborn's neurological development. newborns hospitalized to the neonatal intensive care unit (NICU) experience a lot of monitor noise, which interferes with their sleep. There are numerous non-pharmacological ways to lengthen a newborn's sleep, such as covering the infant in white cotton cloth and placing them in a nest constructed out of rolled cotton bed sheets. The impact of these two positions was assessed in this study.

Objectives: To assess the effectiveness of nesting on sleep quality among newborn with selected demographic and sleep variables.

Materials and Methods: Quasi experimental one group pre-test – post research design was used to conduct this study. A total of 60 samples were selected by using probability sample random technique (computer generated random number). Data was collected with structured demographic and sleep variables with structured sleep assessment checklist. Nesting intervention was given to the newborn. The collected data were analysed based on the mentioned objectives using descriptive and inferential statistics.

RESULTS AND DISCUSSION: Results shows that there was no significant association between the pre-test level of sleep quality among newborn with their selected demographic variables.

CONCLUSION: Newborns who were nested showed improvement in their sleep duration and reduction in number of wake-ups. In order to increase neonates' sleep time, a nesting posture is a cheap, safe, and efficient technique that can be applied widely in NICUs and settings with limited resources. Since nesting lengthens preterm newborns' sleep duration, it might be prioritized in the NICU.

KEYWORDS: Nesting, newborns, sleep quality, sleep pattern

INTRODUCTION

Preterm babies are physically immature and physiologically unstable. They cannot tolerate environmental stimuli. Due to immaturity, they often lack adequate muscle tone and are at the risk of developing an abnormal posture. Nesting helps maintain position, promote comfort and provide physiological, behavioural and postural stability to premature babies.[1] Sleep contributes a pivotal part in neurological improvement of newborns. New-borns admitted to neonatal intensive care unit (NICU) perceive many sounds of monitors and this disturb their rest period. To enhance the sleep duration of neonates many non-pharmacological methods are available like placing newborn in a nest made with rolled cotton bed sheet and wrapping the baby with white cotton cloth. In this research, effect of these two positions were assessed.[2]

Childbirth is more than an event that makes woman a mother. Human Birth is an experience that is shared by every single member of the human race. The birth experience indelibly imprints itself in the lives of both the mother who is giving birth and the baby who is being born.[3] The neonatal period is the most dramatic physiologic changes that occur

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during human life. The transitional period of the newborn is a critical time for humans to adapt to life outside the womb. The loss of the low-pressure placenta and its ability to facilitate gas exchange, circulation, and waste management for the foetus creates a need for physiologic adaptation. Premature birth significantly has physiologic changes [4]. A newborn or neonate, is a child under 28 days of age, neonatal period is characterized by transition to extra uterine life and exquisitely rapid growth and development. This is the phase in life with the greatest risk of mortality as well as maximum potential for long term physical and neurocognitive development (UNICEF, 2018) [5]. Newborn sleep development is highly a dynamic process occurring in parallel to and in interaction with cognitive and physical growth. Sleep develops rapidly during the first few years of life. At birth, newborn lack an established circadian rhythm and hence sleep across multiple intervals throughout the day and night in short bouts, which may also be due to infants feeding needs. Each baby has a different sleep pattern.[6]

According to UNICEF, the current birth rate in 2023 is 17.64 births per 1000 people, a 1.15% decline from 2022. Globally 2.4 million children died in the first month of life in the year 2020. There are approximately 6700 newborn deaths every day, amounting to 47% of all child deaths under the age of 5 years, up from 40% in 1990. With the birth of 25 million children each year, India accounts for nearly one fifth of the world's annual child births[5]. According to Stanford Medicine, the average new born sleeps more in the day and night, waking up only for feed every few hours. It's often hard for new parents to know how long and how often a newborn should sleep. Unfortunately, there is no set schedule at first, and many newborns have their days and nights confused. They think they are supposed to be awake at night and sleep during the day. According to Dr. Jyotsna Deshpande, Pankaj Rajguru, the newborn have so many adjustment problems soon after the delivery. When they were in mother's womb, the temperature is maintained and the flexed position provides much comfort to the baby. After delivery, there is an alteration in the posture. [7]

The striking difference exists between the intrauterine environment and the external environment. Observing the needs of the babies, Danielle Salducci, a pediatric physiotherapist, started to design and make nest which would enable newborns to make movements similar to those made inside their mothers womb. According to Mohammad A Khan, Hamdan Al-Jahdali (2023) Sleep deprivation affects the stability of behavioural and cognitive deficit. Sleep can be promoted by controlling the external environmental stimuli. There are various methods by which sleep can be promoted. Nesting is one type of developmental care. As evident from the above literature, the nesting may help to improve sleep duration and sleep organization and maintain quality of sleep among newborn. In India nursing research looks for cost effective care for least privileged, not much of studies are done on sleep pattern. With the extensive review of literature, the researcher found that the newborn have an disturbed sleep pattern due to the external and the internal stimuli, hence the study was undertaken to confirm the effect of nesting among newborn.[8]

OBJECTIVES
- To assess the pre-test and post-test level of sleep quality among newborn
- To evaluate the effectiveness of nesting on sleep quality among newborn
- To find out the association between the pre-test level of sleep quality among newborns with selected demographic and sleep variables.

HYPOTHESIS
H1: There is a significant difference in the pre-test and post-test level of sleep quality among newborn with the implementation of nesting.
H2: There is a significant association between the pre-test level of sleep quality among newborns with selected demographic and sleep variables.

MATERIALS AND METHODS
Simple random method with computerized random technique was adopted for this study, 60 samples were selected. Participants were explained about the study and informed consent was obtained. The data collection was started after obtaining the permission from the institutional review committee (ICON–IRC 2021-2022-007). The data was collected over a period of four weeks from 17.07.2023 to 31.08.2023. A pre-test was conducted with structured demographic and sleep variables and quality of sleep was assessed by using the Structured sleep assessment checklist. The nesting intervention for the newborn was provided. Nesting is administered for newborn from the age group of 8th day of life to 28th day of life. This technique helps to improve the sleep of newborn. The post test was conducted on the 7th day of the intervention by using the same structured questionnaire. The data was collected for a period of one month.

RESULTS
From the present study, nesting of sleep quality among newborn on the pre-test was effective. Majority of newborn 43(71.7%) had Average, 13(21.6%) had bad and 4(6.7%) had good level of sleep quality and the mean and standard deviation of the level of sleep quality among newborn is 12 ± 2. In post-test, majority of newborn 36(60%) had excellent and 24(40%) had good level of sleep quality and the mean and standard deviation of the level of sleep quality among newborn is 20.93 ± 2.284. The t test value of 23.31 indicates a statistically significant difference in the effectiveness of nesting on newborns' sleep quality, whereas the p value is less than 0.001.

STable 1: Frequency and percentage wise distribution of demographic and sleep variables among newborn.

(N=60)

SL. NO	DEMOGRAPHIC AND SLEEP VARIABLES	FREQUENCY (n)	PERCENTAGE (%)
1	**Age of the child**		
	8 – 14 days	27	45
	15 – 21 days	17	28.3
	22 - 28 days	16	26.7
2	**Gender**		
	Male	26	43.3
	Female	34	56.7
3	**Religion**		
	Hindu	27	45
	Christian	26	43.3
	Muslim	7	11.7
	Others	0	0
4	**Type of family**		
	Nuclear family	21	35
	Joint family	23	38.3
	Single parent family	16	26.7
5	**Current weight of the baby**		
	2.5 kg - 3 kg	11	18.3
	3 – 3.5 kg	38	63.4
	3.5 - 4 kg	11	18.3
6	**Type of delivery**		
	Spontaneous vaginal delivery(SVD)	23	38.3
	LSCS	28	46.7
	Other method	9	15
7	**What type of feeding your baby take?**		
	Breast feeding	44	73.3
	Expressed feeding	10	16.7
	Both	6	10
8	**Income of the parents**		
	Below Rs.5000 /month	18	30

	Rs. 5001- 10,000 /month	20	33.3
	Above Rs.10, 000 /month	22	36.7
	SLEEP VARIABLES		
9	**Sleeping arrangement**		
	Cradle	33	55
	Bed	17	28.3
	Floor	10	16.7
10	**Which position does your baby sleep most of the time**		
	Supine	25	41.7
	Lateral	24	40
	Both	11	18.3
11	**How does your baby fall asleep?**		
	While feeding	35	58.3
	Being rocked	18	30
	On lap	7	11.7
12	**Sleeping environment of the baby**		
	Room	31	51.7
	Hall	24	40
	Both	5	8.3
13	**How much time does your baby spend in sleep during day time**		
	Less than 5 hours	16	26.7
	5- 8 hours	34	56.7
	8- 12 hours	10	16.6
14	**How much time does your baby spend in sleep during night time**		
	Less than 5 hours	16	26.7
	5- 8 hours	15	25
	8- 12 hours	29	48.3
15	**Average number of night waking's per night**		
	Less than 3	10	16.7
	3- 5 times	32	53.3
	More than 5 times	18	30
16	**Duration of feed**		
	Less than 10 minutes	16	26.7

11 – 20 minutes	28	46.6
21 – 30 minutes	16	26.7

According to the frequency and percentage distribution of demographic and sleep variables among newborn, 27(45%) were in the age group of 8 – 14 days, 34(56.7%) were female Newborn. In considering the religion 27(45%) were Hindus, regarding the type of family 23(38.3%) of the Newborns were in Nuclear family. Considering the current weight of the child 38(63.4%) were in 3 – 3.5 kg. In regards to the type of delivery 28(46.7%) were LSCS. Regarding the type of feeding 44(73.3%) newborns were breastfed. Regarding income 22(36.7%) earn above Rs.20, 000 /month, 33 people (55%) were in cradle in regard to sleeping circumstances, 25 (41.7%) of the neonates spent most of their time sleeping in the supine position, 35 (58.3%) of the babies fall asleep while breastfeeding. The baby's sleeping environment was taken into consideration when using thirty-one (51.7%) rooms. The infant slept for five to eight hours during the day 34 times (56.7%). Considering sleep patterns, 29 individuals (48.0%) slept 8–12 hours at night. 32 (53.3%) people woke up three to five times a night on average. The duration of feed 28 (46.6%) was from 11 to 20 minutes.

Table 2: Frequency and percentage wise distribution of pre-test and post-test level of sleep quality among newborn.

(N=60)

LEVEL OF SLEEP QUALITY	PRE-TEST		POST TEST	
	n	%	n	%
Excellent	0	0	36	60
Good	4	6.7	24	40
Average	43	71.7	0	0
Bad	13	21.6	0	0
Worst	0	0	0	0
Mean **Standard deviation**	12 ± 2		20.93 ± 2.284	

The above table shows the frequency and percentage wise distribution of pre-test and post-test level of sleep quality among newborn. In pre-test, majority of newborn 43(71.7%) had average, 13(21.6%) had bad and 4(6.7%) had good level of sleep quality and the mean and standard deviation of the level of sleep quality among newborn is 12 ± 2. In post-test, majority of newborn 36(60%) had excellent and 24(40%) had good level of sleep quality and the mean and standard deviation of the level of sleep quality among newborn is 20.93 ± 2.284.

Table 3: Effectiveness of nesting on sleep quality among newborn.

(N=60)

Effectiveness of sleep quality among newborns	MEAN	STANDARD DEVIATON	MEAN DIFFERENCE	't' VALUE	'p' VALUE
Pre-test	12	2			**0.000****
Post-test	20.93	2.284	8.93	23.31	**HS**

*****-p < 0.001 highly significant , NS-Non Significant.*

The above table shows that the mean score of effectiveness of nesting on sleep quality among newborn in the pre-test was 12 ± 2 and the mean score in the post- test was 20.93 ± 2.284. p value shows < 0.001 and t test value = 23.31 statistically highly significant difference of effectiveness of nesting on sleep quality among Newborn. Hence Hypothesis H1 was accepted.

Table 4: Association between the pre-test level of sleep quality among newborns in nesting with demographic variables and sleep variables.

(N=60)

SL		PRE-TEST LEVEL OF SLEEP	Chi-

No	DEMOGRAPHIC AND SLEEP VARIABLES	Good		Average		Bad		square X^2 and P-Value
		n	%	n	%	n	%	
1	**Age of the child**							X^2=5.28
	8 – 14 days	1	25	21	48.8	5	38.4	Df=4
	15 – 21 days	3	75	10	23.3	4	30.8	p =0.25
	22 - 28 days	0	0	12	27.9	4	30.8	NS
2	**Gender**							X^2=2.87
	Male	3	75	16	37.2	7	53.8	Df=2
	Female	1	25	27	62.8	6	46.2	p =0.237 NS
3	**Religion**							X^2=3.89
	Hindu	2	50	17	39.5	8	61.5	Df=4
	Christian	1	25	20	46.5	5	38.5	p =0.42
	Muslim	1	25	6	14	0	0	NS
	Others	0	0	0	0	0	0	
4	**Type of family**							X^2=3.5
	Nuclear family	0	0	15	34.9	6	46.2	Df=4
	Joint family	3	75	16	37.2	4	30.7	p =0.468
	Single parent family	1	25	12	27.9	3	23.1	NS
5	**Current weight of the baby**							X^2=1.76
	2.5 kg - 3 kg	1	25	8	18.6	2	15.4	Df=4
	3 – 3.5 kg	2	50	26	60.5	10	76.9	p =0.77
	3.5 - 4 kg	1	25	9	20.9	1	7.7	NS
6	**Type of delivery**							X^2=1.93
	Spontaneous vaginal delivery	1	25	16	37.2	6	46.2	Df=4
	LSCS	3	75	20	46.5	5	38.5	p =0.74
	Other method	0	0	7	16.3	2	15.3	NS
7	**What type of feeding your baby take?**							X^2=1.5
	Breast feeding	2	50	32	74.4	10	76.9	Df=4
	Expressed feeding	1	25	7	16.3	2	15.4	p =0.82
	Both	1	25	4	9.3	1	7.7	NS
8	**Income of the parents**							X^2=3.25
	Below Rs.5000 /month	0	0	14	32.6	4	30.8	Df=4
	Rs. 5001- 10,000 /month	1	25	14	32.6	5	38.4	p =0.516
	Above Rs.10, 000 /month	3	75	15	34.4	4	30.8	NS
	SLEEP VARIABLES							
9	**Sleeping arrangement**							X^2=4.11
	Cradle	4	100	22	51.2	7	53.8	Df=4
	Bed	0	0	14	32.6	3	23.1	p =0.391

	Floor	0	0	7	16.2	3	23.1	NS	
10	**Which position does your baby sleep most of the time**							X²=2.46	
	Supine	2	50	19	44.2	4	30.8	Df=4	
	Lateral	2	50	15	34.9	7	53.8	p =0.652	
	Both	0	0	9	20.9	2	15.4	NS	
11	**How does your baby fall asleep?**							X²=1.93	
	While feeding	2	50	24	55.8	9	69.2	Df=4	
	Being rocked	2	50	13	30.2	3	23.1	p =0.74	
	On lap	0	0	6	14	1	7.7	NS	
12	**Sleeping environment of the baby**							X²=2.51	
	Room	1	25	24	55.8	6	46.2	Df=4	
	Hall	2	50	16	37.2	6	46.2	p =0.64	
	Both	1	25	3	7	1	7.6	NS	
13	**How much time does your baby spend in sleep during day time**							X²=8.02	
	Less than 5 hours	0	0	14	32.6	2	15.4	Df=4	
	5- 8 hours	3	75	25	58.1	6	46.2	p =0.09	
	8- 12 hours	1	25	4	9.3	5	38.4	NS	
14	**How much time does your baby spend in sleep during night time**							X²=0.66	
	Less than 5 hours	1	25	11	25.6	4	30.8	Df=4	
	5- 8 hours	1	25	10	23.3	4	30.8	p =0.955	
	8- 12 hours	2	50	22	51.1	5	38.4	NS	
15	**Average number of night waking's per night**							X²=3.51	
	Less than 3	1	25	7	16.3	2	15.4	Df=4	
	3- 5 times	3	75	24	55.8	5	38.5	p =0.47	
	More than 5 times	0	0	12	27.9	6	46.1	NS	
16	**Duration of feed**							X²=0.207	
	Less than 10 minutes	1	25	11	25.6	4	30.8	Df=4	
	11 – 20 minutes	2	50	20	46.5	6	46.1	p =0.99	
	21 – 30 minutes	1	25	12	27.9	3	23.1	NS	

*-p < 0.05 significant, *-p < 0.001highly significant, NS-Non significant

The above table shows that there was no significant association found in the pre-test level of sleep quality among newborns with demographic variables and sleep variables respectively. Hence Hypothesis H2 was rejected.

DISCUSSION

The objective of the study is to assess the effectiveness of nesting on sleep quality among newborn with selected demographic and sleep variables. The findings of the study were discussed with references to the objective assumption stated. In this section, the major findings of the present study have been discussed with the reference to the result obtained by the other researcher.

According to the study's findings, the majority of newborns—43, or 71.7%—had average sleep quality on the pre-test, followed by 13 with poor sleep quality (21.6%) and 4 with high sleep quality (6.7%). The majority of newborns had excellent sleep quality in 36 cases (60%) and good sleep quality in 24 cases (40%) according to the post-test results. The results of this study showed the effectiveness of nesting on newborns' sleep quality varied with the mean score in the post-test being 20.93 ± 2.284 and the p-value being less than 0.001 and the t-value being 23.31. The newborns' pre-test score was 12 ± 2. Consequently, Hypothesis H1 was accepted. The present study shows that there was no significant association between the pre-test level of sleep quality among newborn in nesting with their selected demographic variables and sleep variables.

The study was supported by Angel Rose (2021) on effectiveness of swaddling techniques on promotion of sleep pattern among newborns at Ashwin hospital, Coimbatore. The result reveals that based on the duration of sleep cycle, the scores were classified under three groups; mild sleep, moderate sleep, deep sleep based on the Anders and Chalemian Sleep Scoring. In Pre-test; deep sleep 0 (0%), moderate sleep 12 (40%) and Mild sleep 18 (60%). In Post-test; deep sleep 15 (50%), moderate sleep 13 (43.3%) and mild sleep 2 (6.7%) in the experimental group. Hence there was a significant difference between the pre-test and post- test level of sleep quality after swaddling technique.[9]

Mony K. et al. (2018) provided support for the aforementioned study on the impact of nesting on sleep patterns in preterm infants admitted to NICUs at certain hospitals in Kerala. The duration of sleep in each stage is as follows: active sleep duration was significantly lower (34.76) with nesting than with routine care (39.55); quiet sleep duration was significantly higher (63.62 ± 17.957) with nesting than with routine care, but this difference was not significant (t=1.134, P=0.270); and indeterminate sleep duration was significantly higher with nesting than with routine care.[10]

Karamjeet Kaur et al. (2022) carried out a similar study in a selected hospital in New Delhi to evaluate the impact of nesting on the physiological parameters and posture of preterm babies. The findings show that the physiological parameters of heart rate, respiratory rate, and oxygen saturation do not significantly correlate with the chosen demographic characteristics, such as the mode of delivery, maternal complications, the mother's unhealthy habits, the gestational period, the age of the preterm baby, and birth weight.[11]

CONCLUSION:

The present study aimed to assess the effectiveness of nesting on sleep quality among newborn at selected villages, Puducherry concludes that the nesting was statistically highly significant in enhancing the sleep quality among newborn at selected villages.

RECOMMENDATIONS

- A similar kind of study can be conducted for a large group to strengthen the findings.
- Similar study can be conducted at different settings among newborns.
- A study can be done to assess the knowledge, attitude and practice of non- pharmacological management of increasing newborns sleep pattern among the staff nurses in the pediatric setting of the hospital.
- A comparative study can be conducted to assess the sleep quality and other non – pharmacological techniques which promotes the sleep pattern among newborns.

Conflict of Interest

The authors have declared that no competing interests exist.

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