



A STUDY TO ASSESS THE EFFECT OF SWADDLING TECHNIQUE FOR PROMOTION OF SLEEP PATTERN AMONG NEWBORN BABIES IN A SELECTED HOSPITAL, ASSAM.

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ABSTRACT

Background: One of the most moving and inspiring events that may happen in a person's life is the birth of a child. After nine months of waiting and planning, the newborn arrives in a whirlwind of excitement. The objective of the study is to assess the effect of swaddling technique for promotion of sleep pattern among newborn babies in a selected hospital, Assam. **Materials and methods:** A quantitative approach using True Experimental pre-test post-test control group design was conducted in Postnatal ward of STHG Civil Hospital, Morigaon, Assam and 60 samples were selected using simple random sampling technique. The data were analysed using descriptive and inferential statistics. **Result:** The study revealed that the pre-test mean value of sleep score was 3.2 with SD 0.76 and the post-test 1st day mean value of sleep score was 3.8 with S.D 0.80. The calculated t_{29} value of 3.16 and ' p ' value of 0.003675 was found to be statistically significant at $p < 0.05$ level. The pre-test mean value of sleep score was 3.2 with SD 0.76 and the post-test 2nd day mean value of sleep score was 4.3 with S.D 0.78. The calculated t_{29} of 5.09 and ' p ' value of 0.0002 was found to be statistically very highly significant at $p < 0.001$ level. This clearly shows that the administration of swaddling technique among newborn babies for increasing their sleep pattern had significant improvement in their 1st and 2nd day of post-test regarding of sleep pattern among new-born

babies in experimental group. **Conclusion:** The study revealed that for experimental group, mean pre-test sleep pattern score was lower than the mean post-test 1st day and 2nd day sleep pattern. Thus, Swaddling technique was effective for promotion of sleep pattern among newborn babies.

KEYWORDS – Effect, Swaddling Technique, Sleep pattern, Term newborn babies.

CHAPTER – I INTRODUCTION BACKGROUND OF THE STUDY

“Babies Are Like Little Hope Bundles, The Future In A Basket”

One of the most moving and inspiring events that may happen in a person’s life is the birth of a child. After nine months of waiting and planning, the new-born arrives in a whirlwind of excitement. The cornerstone for the quality of parenting is providing new-born with the appropriate care, without any physical or mental impairments. New born sleep development is a highly dynamic process occurring in parallel to and in interaction with cognitive and physical growth. Each baby has a different sleep pattern.¹ Sleep develops rapidly during the first few years of life. At birth, new born lacks an established circadian rhythm and hence they sleep across multiple intervals throughout the day and night in short bouts, which may also be due to new born feeding needs.²

Sleep is a necessary function of life. Studies consistently have shown the importance of sleep in its role for cognitive function and developing memories of babies.³ Swaddling was an almost universal child – care practice before the 18th century. In general, swaddled neonates have shown improved neuromuscular development, less physiologic distress, better motor organization, and more self – regulatory ability while awaking 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 (SIDS), which makes it necessary to alert parents to halt swaddling if neonate attempts to turn.⁴

Sleep plays a critical role in their physical and mental development including brain development, physical growth, emotional regulation, immune system, memory consolidation, circadian rhythm. Sleep is essential for newborn babies, and it’s crucial to establish a safe and supportive sleep environment to promote healthy sleep habits.

Romeo M D, Arpaia C, Lala R M, Cordaro G, Gallini F, Vento G, Mercuri E, Chiaretti A (2023) conducted a study to assess the sleep disorders in Low-Risk Preterm Infants and Toddlers. The aims of the present study are to assess the presence of sleep disorders in a population of very preterm infants at 6-36 months who are at low risk of neurological impairments using the Italian version of the sleep disturbance scale for children (SDSC) adapted for this age group. The study comprised 129 usually developing infants and toddlers as well as 217 low-risk preterm new-borns. The SDSC total and factor scores did not differ

between these two baby populations, according to our findings. Low-risk preterm infants and toddlers showed similar incidences of sleep disorders to their term-born peers. 217 preterm infant (104 males and 113 females) that met the inclusion criteria during the study period had a mean gestational age of 27.6 weeks (range: 25–33 weeks). On the Griffiths' Mental Development Scale, every infants reported a score that was within the normal range. The mother of the preterm infants completed the SDSC at an average age of 18 months (range: 6–36 months). The questionnaire was also filled out by the mother of 129 usually developing children (62 male and 67 female) with a median age of 20 months (range 6-36 months). The control group had the same age and gender distribution as the preterm group ($p > 0.05$).³⁶

Ghosh S, (2022) conducted a study to assess the Effectiveness of Nesting and Swaddling on Sleep and Selected Physiological Parameters among Hospitalized Low Birth Weight Neonates in Selected Hospitals in West Bengal. The objective of this study was to assess the effects of nesting and swaddling on sleep. As for physical measures, the results indicated that there was no significant difference between the nesting and swaddling groups and the control group, with the exception of breathing ($f=3.55$, $p<0.034$). With the exception of the first day ($t=1.9292$, $p<0.05$), the results likewise showed a highly significant difference in sleep patterns ($p<0.001$) between the nesting and swaddling group and the control group. Comparing the two scenarios to control, it can be stated that swaddling and nesting might both greatly enhance sleep. By keeping a decent posture, nurses can provide LBW infants with a safe environment. This study has implications for practicing nursing. Similar research with a large sample size for generalization could be done in as a result these findings.³⁰

NEED OF THE STUDY

Newly parents often learn how to swaddle their new born babies from the nurses in the hospital. A thin blanket wrapped snugly around the baby's body can resemble the womb and help soothe the new born. When done correctly, swaddling can be an effective technique to help calm new born babies and promote sleep.⁵ It makes a baby feel like he's back inside the womb or like he is being snuggled close. It has been shown to help many babies sleep better. It can be particularly helpful for babies with neurologic problems. It also can really help some parents get their babies to fall and stay asleep on their backs, which is what we recommend to help prevent sudden infant death syndrome (SIDS).

Some babies have trouble with sleeping on their backs because they startle themselves when awake but that's less likely to happen when they are swaddled. Also, there are some downsides of swaddling if not done properly. Swaddling keeps the legs together and straight which can increase the risk of hip problems and also if the fabric used for swaddling turns loose, it can increase the risk of suffocation.⁶

A study to assess influence of swaddling on sleep and arousal characteristic of healthy infants revealed that swaddling promotes more sustained sleep and reduces the frequency of spontaneous awakenings, whereas induced cortical arousals are elicited by less-intense stimuli. These findings could indicate that, although swaddling favors sleep continuity, it is associated with increased responsiveness to environmental auditory stress.¹⁵

Sleep disorders are classified into dyssomnias, parasomnias, sleep disorder associated with medical and psychiatric disorders and proposed sleep disorders. Only the parasomnias have been studied as such in the newborn period. The parasomnias that occur in this age group are infant sleep apnea, congenital central hypoventilation

syndrome, sudden infant death syndrome, and benign neonatal sleep infant death syndrome and benign neonatal sleep myoclonus.²⁵

Another Quasi experimental study conducted by J.S. Angel Rose (2021) among 60 new born (0-28 days) on the effectiveness of swaddling techniques on promotion of sleep pattern among new born at Ashwin hospital, Coimbatore which revealed that in the experimental group the post-test value of sleep score was 58.07 where as in the control group the post-test value of sleep score was 114.07. The calculated paired, 't' value of $t = 10.03$ was found to be statistically highly significant at $p < 0.05$.⁷

The investigator during her clinical postings has seen that the mothers of the newborn babies are not able to properly swaddle their babies due to their lack of awareness and knowledge. Thus, the investigator has chosen this study in order to create awareness among the mothers regarding the swaddling technique for improving the sleeping pattern of the new born babies.

STATEMENT OF THE PROBLEM

“A study to assess the effect of swaddling technique for promotion of sleep pattern among newborn babies in a selected hospital, Assam”.

OBJECTIVES OF THE STUDY

- 1) To assess the sleep pattern among newborn babies in both the experimental group and control group in a selected hospital, Assam.
- 2) To determine the effect of swaddling technique for promotion of sleep pattern among newborn babies in the experimental group in a selected hospital, Assam.
- 3) To find out the association between the pre-test level score of sleep pattern among newborn babies in both experimental group and control group with their selected demographic variables.

ASSUMPTIONS

The study assumes that-

- Swaddling technique may help in promotion of sleep among newborn babies.
- Mothers may have less knowledge regarding swaddling technique.

OPERATIONAL DEFINITIONS

Assess –

According to Sharma SK, a process of measuring and analysing a performance or product to provide quality, timely feedback for improvement.¹²

In this study, assess refers to the measuring and analysing of the effect of swaddling technique for promotion of sleep pattern among newborn babies in selected hospital, Assam.

Effect –

According to The Britannica Dictionary, a change that result when something is done.²³

In this study, effect refers to the statistical difference between the mean post test scores of the babies in the experimental group who underwent swaddling and the control group who did not undergo swaddling technique.

Swaddling technique –

According to English Dictionary, the practice of wrapping infants in clothing that restricts movement.²⁴

In this study, swaddling technique refers to the wrapping of those newborn babies in the experimental group with a preferably square shaped blanket or a cotton cloth for maintaining the warmth and security and this will be administered only to the experimental group for a period of 2 days.

Sleep pattern –

According to Oxford Learner's Dictionaries, the natural state of rest in which your eyes are closed, your body is not active, and your mind is not conscious.²¹

In this study, sleep pattern refers to the sleep schedule of newborn babies with a minimum of 17-18 hours where, 7- 8 hours spent during day time and minimum 8-9 hours spent during night time, which will be assessed with the help of Anders and Chalemian scoring (Mild Sleep of 0-2, Moderate Sleep of 3-4, Deep of 5-6).

Newborn babies –

According to World Health Organization, a newborn infant, or neonate, is a child under 28 days of age.²²

In this study, newborn babies refers to those babies who are under 1 month of age after birth.

HYPOTHESES

H₁ – There is a significant mean difference between the pre-test and post-test score of sleep pattern among newborn babies in the experimental group.

H₂- There is a significant mean difference in the post-test scores of sleep pattern among newborn babies between the experimental group and the control group.

H₃– There is a significant association between pre-test score of sleep pattern among newborn babies in both experimental group and control group with their selected demographic variables.

NULL HYPOTHESES

H₀₁ -There is no significant mean difference between the pre-test and post-test score of sleep pattern among newborn babies in the experimental group.

H₀₂ -There is no significant mean difference in the post-test scores of sleep pattern among newborn babies between the experimental and the control group.

H₀₃ -There is no significant association between pre-test score of sleep pattern among newborn babies in both experimental group and control group with their selected demographic variables.

DELIMITATION

This study is delimited to –

The newborn babies admitted in Postnatal ward of Swahid Tilak Hemram Gunabhiram (STHG) Civil Hospital, Morigaon, Assam.

CONCEPTUAL FRAMEWORK

The conceptual Framework selected for this study is based on J.W. Kenny's Open System Model. The open system model was formulated in the year 1999. An open system is a system which continuously interacts with its environment. The interaction can take the form of information, energy or matter transfers into or out of the system boundary, depending on the discipline which defines the concept. An open system should be contrasted with the concept of an isolated system which exchanges neither energy and matter nor information with its environment.⁹

This study is undertaken to determine the effect of swaddling technique for promotion of sleep pattern among newborn babies. Pre – test was conducted to assess level of sleep pattern among newborn babies. Input and output are processed by which a system is able to communicate and react with its environment.⁷

The three major aspects of the systems are –

- 1) Input
- 2) Throughput
- 3) Output
- 4) Feedback

Input –

Input is any type of information, energy and matter that enters the systems from environment through its boundaries.⁹ Input can be matter, energy and information from the environment. In this study the environment refers to hospital and refers to the collection of demographic variables from the samples such as age of the baby, sex of the baby, weight of the baby, types of delivery, family history of SIDS.

Throughput –

The throughput is the energy, information or matters which are continuously processed through the system. Throughput is a process that occurs at some point between the input and output process. It enables the input to be transferred in such a way that it can be used readily by the system. In the throughput phase, swaddling is done to assess the sleep pattern among newborn babies in the experimental group and routine care in control group.

Output –

An output is the result of the continuous processing of an energy, information or matter. Output is an energy that is transferred to the environment. After processing the input and throughput, the system returns to the output matter, energy and information in an altered state. In the output phase, the experimental group able to cope up procedure as evidenced by squeezed eyes, quite breathing and no crying whereas in control group not able to cope up as evidenced by crying, vigorous movements.

Feedback –

A Feedback is the information of responses of the environment in the output. Feedback refers to the environment response to the systems, output used the system in adjustment, correction and accommodation to the interaction with the environment. In this study, swaddling was done for newborn babies in the experimental group, whereas swaddling was not done in the control group.⁷

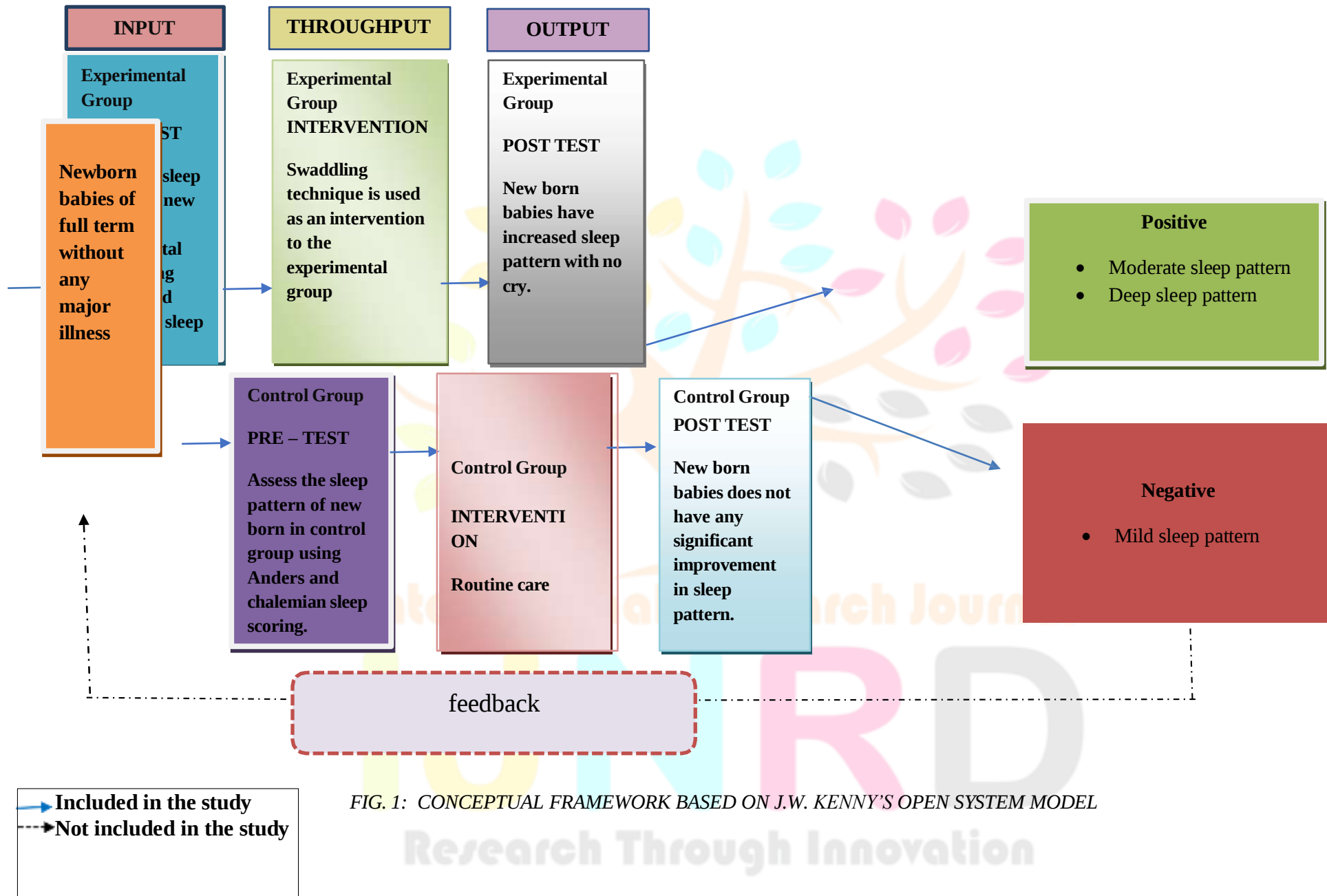


FIG. 1: CONCEPTUAL FRAMEWORK BASED ON J.W. KENNY'S OPEN SYSTEM MODEL

SUMMARY

This chapter deals with the background of study, need of the study, operational definition, conceptual framework, assumption, hypotheses and delimitation.

CHAPTER II

REVIEW OF LITERATURE

A review of literature is a description and analysis of the literature relevant to a particular field or topic. It provides an overview of what work already had been carried out, who are the key researcher who did the that work, which of the questions are already answered regarding a particular area of research interest, what methods and methodologies were used to answer the particular questions and what are the prevailing theories and hypothesis.¹²

The literature review for the current study is organized under the following headings:

SECTION I: Studies related to effect of swaddling technique on sleep pattern among newborn babies.

SECTION II: Studies related to promotion of sleep pattern among newborn babies.

SECTION I: STUDIES RELATED TO EFFECT OF SWADDLING TECHNIQUE ON SLEEP PATTERN AMONG NEWBORN BABIES.

Bhaisare P, Sawant S, Mahapure D, Modak P, Landge H, Khadse J, Katalkar V (2024) conducted a study to Assess the Effect of Swaddling on Quality of Sleep among Neonate in Selected Hospital. A study conducted with aim to assess the effect of swaddling on quality of sleep among neonate in selected hospital, Pune. This study used a quantitative research approach using a quasi-experimental pre-test-post-test only control research design. The study used a non-probability sampling technique to pick fifty samples. The study was carried out at Dr. D. Y. Patil Hospital & Research Centre (PNC WARD), Pimpri, Pune. Data was collected using demographic variables as well as Anders and Chalemian's sleep scoring. Data were analyzed using descriptive and inferential statistics. The results demonstrate that all of the newborns in the experimental group deep sleep (scoring 5–6). In the control group, 56% of newborns had mild sleep (Score ≤ 2) and 44% had moderate sleep (Score 3–4). The average quality of sleep score among neonates in the experimental group was significantly greater than in the control group.²⁶

Akkoca Z, Yavuz B, Sezgin K A, Bildirici Y (2023) conducted a study to assess the effect of the swaddling method on stress levels in newborns administered nasal CPAP. This study aims to investigate the effects of the swaddling method on the stress levels in newborns receiving nasal continuous positive airway pressure (nCPAP). The research revealed that the NSS mean score following the intervention (3.52 ± 2.57) was less than the pre-intervention score (10.02 ± 2.05) ($p < 0.05$). After the intervention, the babies' mean saliva cortisol levels

(4.99 ± 1.89) were lower than their pre-intervention values (5.51 ± 1.65) ($p < 0.05$). After the intervention, the neonates' mean heart rate was 135.50 ± 14.15 and their respiratory rate was 68.07 ± 10.16 ($p < 0.05$). The mean oxygen saturation of babies did not change before or after the intervention ($p < 0.05$).²⁷

Shelke S, Jaywant S (2023) conducted a study to assess the effect of nesting and swaddling on sleep and physiological parameters of preterm infants. This study aimed to investigate the effect of nesting and swaddling on the sleep duration of premature infants hospitalized in NICUs. As a result, 30 studies in all were located, three of which satisfied the requirements for inclusion. Both quiet sleep and overall sleep were found to be improved by the swaddling and nesting. The infants heart rate, breathing rate, and SPO2 levels were all maintained. It has been found that the preterm infants used less energy because they were in a relaxed state.²⁸

Perez V S, Robleda G, Gich I, Nolla T, Taylor P J, Verd S, Ginovart G (2023) conducted a study to assess the Physiological responses and behavioural organization of very low birth weight infants during swaddled versus traditional weighing. The objective of this study was to enable very low birth weight infants to maintain adequate self-regulation during weighing. In an intensive care nursery, infants were exposed to both swaddled and unswaddled weighing. Two days in consecutively, the weights of Nineteen babies with very low birth weights were recorded. The ALPS- Neo score, heart rate, and respiratory rate were all noted. The stress score significantly increased from 1.26 (pre-weight) to 4.97 (weight measurement) in the control periods, while it significantly decreased from 1.65 (pre-weight) to 0.23 (swaddled-intervention periods. Swaddled-intervention periods. During weight measurement, heart and respiratory rate were significantly lower for swaddled-intervention days when compared to control days. Swaddled weighing has been shown to have a considerable stress – reduction effect, this method can be used as an appropriate weighing procedure in intensive care. There are no patient or public contributions to this research.²⁹

Ghosh S, (2022) conducted a study to assess the Effectiveness of Nesting and Swaddling on Sleep and Selected Physiological Parameters among Hospitalized Low Birth Weight Neonates in Selected Hospitals in West Bengal. The objective of this study was to assess the effects of nesting and swaddling on sleep. As for physical measures, the results indicated that there was no significant difference between the nesting and swaddling groups and the control group, with the exception of breathing ($f=3.55$, $p<0.034$). With the exception of the first day ($t'=1.9292$, $p<0.05$), the results likewise showed a highly significant difference in sleep patterns ($p<0.001$) between the nesting and swaddling group and the control group. Comparing the two scenarios to control, it can be stated that swaddling and nesting might both greatly enhance sleep. By keeping a decent posture, nurses can provide LBW infants with a safe environment. This study has implications for practicing nursing. Similar research with a large sample size for generalization could be done in as a result these findings.³⁰

Vadakkan J A, Prabakaran V (2022) conducted a study to Comparison of the Effect of Nesting and Swaddling on Sleep Duration and Arousal Frequency among Preterm Neonates: A Randomized Clinical Trial. In the NICU of a tertiary care facility, 76 preterm newborns participated in a randomized clinical experiment. The study included newborns based on a random selection process. Direct observation was used to measure the amount of

sleep and the frequency of arousal. An electronic heart monitor was used to measure physiological data. SPSS version 21 was utilized for the analysis of the gathered data. The nesting group sleep for much longer than the swaddling group, with mean (SD) sleep durations of 206.4 (28), 183.1 (34.78) minutes, and respectively. Additionally, there was a lower frequency of awakenings in the nesting group.³¹

Patimah I, Koesendang E, Nurmawan S, Minaf A (2022) conducted a study to assess the effect of polyethylene swaddle in hypothermia prevention among low-birth weight neonates. The objective of this study was to examine the effectiveness of swaddling technique in hypothermia prevention among low-birth weight neonates. This randomized controlled trial was conducted on 40 recent babies (20 controls and 20 interventions), using a pre- and post-test design. The intervention group was swaddled with polyethylene, while the control group was swaddled with cloth. The body temperature was measured using a digital axillary thermometer, and the Mann-Whitney U-test and Wilcoxon test were used to compare the two groups temperature. The intervention group's average temperature improved (Pre 34.8°C, post 36.4°C) compared to the control group (Pre 33.3°C, post 34.9°C). There were significant within-group changes in both groups ($P < 0.05$) although no significant difference was found between the two groups ($P = 0.267$).³²

Rose A S J (2021) conducted a Quasi – experimental study to assess the effectiveness of swaddling technique on promotion of sleep pattern among new-borns at Ashwin hospital, Coimbatore. The objective of this study was to assess the effectiveness of swaddling techniques on promotion of sleep pattern among newborns in the experimental group. A Quasi experimental study was conducted at Aswin Hospital, Coimbatore. 60 new-borns (0-28 days) were selected by non-probability sampling technique of which 30 are experimental group and 30 are control group. Results: For the experimental group, the mean sleep score before testing was 58.87 with a standard deviation of 9.06, and the mean score after testing was 114.07 with a standard deviation of 27.7. The paired, 't' value of t=11.49 that was found to be statistically significant at $p < 0.05$. The pre-test mean sleep score for the control group was 55.23 with a standard deviation of 8.86, and the post-test mean score was 58.07 with a standard deviation of 12.99. The paired 't' value of $t = 1.1$, which was calculated, was determined to be not significant ($p = 0.274$). When the post-test mean value of the sleep score was compared between the experimental and control groups, the experimental group's value was 58.07 with standard deviation of 12.99, whereas the control group's value was 114.07 with standard deviation of 27.69. It was determined that the paired, 't' value of $t = 10.03$ was statistically significant at $p < 0.05$.⁷

Maher G, Elarousy W (2018) conducted a study to assess the Effect of Nested and Swaddled Prone Positioning on Sleep and Physiological Parameters of Low-Birth Weight Neonates. The aim of the study is to determine the effect of nested and swaddled prone positioning on sleep and physiological parameters of Low-Birth Weight Neonates. The 60 low birth weight neonates were selected using convenient sampling, with the first neonate being assigned at random to the control or experimental group. The remaining low birth weight neonates in each group were then selected in alternative. 30 neonates were placed in a swaddled and nested prone position (study group), whereas the remaining 30 were placed in a prone position only (control group). All neonates in both groups had their physiological parameters and sleep state evaluated using an observational checklist for sleep state evaluation. After nesting, the mean heart rate of the neonates was 143.40 ± 14.95 , which was

statistically significant compared to the control group's heart rate of 157.57 ± 15.88 . Additionally, the study group's mean oxygen saturation was higher than the control group's (97.43 ± 1.47 , 95.63). In addition, it was revealed that 43.3% of neonates in the study group and 10% of neonates in the control group were in deep sleep, with statistically significant differences between the two groups.³³

Ali A K, Faezeh J, Kamran M, Sharafat A (2018) conducted a study to assess the Effect of Swaddling in Physiological Changes and Severity of Pain Caused by Blood Sampling in Preterm Infants. The aims of this study was to evaluate the effect of swaddling on reducing the pain associated with venous blood sampling in preterm infants. The results revealed that pain in the swaddling group was significantly reduced compared to that in the control group. In addition, the results revealed that changes in heart rate were less and more stable and returned to the baseline level faster in the swaddling group, while in the control group, the changes were more and did not return to baseline level even after 120 seconds.⁴⁹

Zeynep E, and Suzan Y (2017) conducted a study to assess the effect of swaddling on pain, vital signs, and crying duration during Heel Lance in Newborns. The aimed to determine the effect of swaddling on pain, vital signs, and crying duration during heel lance in the newborn. A total of 54.1% of the experimental group and 48.6% of the control group were girls. For gestational age, 70.3% of the newborns in the experimental group and 56.8% of the control group were 39 weeks, and 54.1% of the experimental group and 67.6% of the control group were at the postnatal age of 24 hours. There were no significant differences between the experimental and control groups in terms of sex, gestational age, postnatal age, and type of birth, which meant that the groups were similar ($p > .05$). When the experimental and control group were examined in terms of duration of heel lance, the procedure was completed in 70.74 ± 10.89 seconds in the experimental group and in 73.46 ± 12.90 seconds in the control group. There was no statistically significant difference between the groups, and they were similar to each other in duration of heel lance ($p > .05$).⁴⁷

Abdeyazdan1 Z, Ghahfarokhi M M, Ghazavi Z, Mohammadizadeh M (2016) conducted a study to assess the Effects of nesting and swaddling on the sleep duration of premature infants hospitalized in neonatal intensive care units. This study aimed to investigate the effect of nesting and swaddling on the sleep duration of premature infants hospitalized in NICUs. In a crossover clinical trial, 42 preterm infants who met the inclusion criteria were enrolled. They were divided into two groups – nest- swaddle and swaddle - nest at randomly assigned. Prechti's criteria and observation were used to assess the status of sleep. Next, the durations of quiet sleep time (QST) and total sleep time (TST) were noted. Repeated measure analysis of variance, was used to analyze the data. In both groups, the mean TST and QST values during the nesting and swaddling periods were significantly higher than in the control period ($p < 0.001$). Mean values of TST and QST in the swaddling period were higher than in the nesting period in both groups, However, these differences were not significant ($P = 0.245$).³⁴

Paran M, Edraki M, Montaseri S, Nejad R M (2016) conducted a study to Comparing the Effects of Swaddle and Conventional Bathing Methods on Behavioral Responses in Preterm Neonates. A randomized clinical trial including 50 preterm newborns admitted to the NICU was carried out for this investigation. Neonates who fulfilled the requirements for inclusion were randomized at random to be placed in the experimental and control

groups. Swaddle bathing was given to the newborns in the experimental group, whereas traditional bathing was given to the infants in the control

group. The newborns' faces were captured on close-up video while they were bathing in order to document the behavioral reactions. The independent samples t-test, Mann-Whitney U test, and chi-squared test were used to evaluate the data. The results demonstrated that the occurrence rates of such behaviors as facial grimace ($p < 0.001$), mouthing/yawning movements ($p < 0.001$), tongue extension ($p = 0.017$), eyes open ($p = 0.027$), and fussing/crying ($p < 0.001$) were significantly lower in the experimental group than those in the control group. In addition, the percentage of eyes closed was higher in the experimental group, compared to the control group ($p = 0.006$).³⁵

Shunmuga. P. C (2014) conducted a post – test only non-equivalent control group quasi -experimental study to assess the effectiveness of swaddling technique on pain level during invasive procedure among new-borns admitted in selected hospitals at Madurai. The conceptual framework of the study was based on Ludwig Von Bertalanffy's General system Theory, and the experimental approach and post-test only non-equivalent control group quasi experimental design were used. The study's population consisted of new-born the age of 1-14 days who had undergone invasive surgeries at Govt. Rajaji Hospital in Madurai. Sample size 60 were randomly assigned to the experimental and control groups using the convenience sampling method. Data collection tool consist of demographic profile of the child and standardized pain assessment scale, NFCS- Neonatal Facial Coding System. The results revealed that throughout the invasive procedures, the experimental group's mean post-test pain score (4.06) was significantly lower than the control group's mean post-test pain score (6.2). the study showed that the swaddling technique was highly effective in reducing pain in new-born during invasive procedures.¹⁴

Franco. P, Seret. N, H. V. N. J, Scaillet. S, Groswasser. J, Kahn. A. (2013) conducted a study to assess Influence of swaddling on sleep and arousal characteristic of healthy infants. Swaddling is a traditional method of baby care. It has been observed to promote sleep and reduce crying among irritable infants. The physiological impacts of swaddling on an infant's sleep-wake patterns are not well studies. Design: Sixteen healthy infants, with a median age of 10 weeks (range: 6-16), were subjected to polygraphic recording while lying supine as usual. The baby was first observed being swaddled and then not. Results show that while swaddling encourages longer stretches of sleep and lessens the frequency of spontaneous awakenings, less intense stimuli are necessary to cause induced cortical arousals. These results may suggest that swaddling promotes sleep continuity but also increases sensitivity to auditory stress in the surroundings.¹⁵

Claudia M. G, Kathleen A. H, and Bradley T. T (2009) conducted a study to assess the Spontaneous Arousals in Supine Infants While Swaddled and Unswaddled During Rapid Eye Movement and Quiet Sleep. The aimed to Supine sleep is recommended for infants to decrease the risk of sudden infant death syndrome, but many parents report that their infants seem uncomfortable supine. The results show that Twenty-six infants had QS during unswaddled and swaddled periods. Twenty-two infants had REM sleep during both periods. The average study duration was 107 ± 7 minutes (range: 58–178 minutes). No infants escaped from the swaddle despite increased motor activity when awake. The frequency of sighs per hour was unchanged when swaddled during

both QS and REM sleep. The frequency of startles was decreased with swaddling during QS ($P < .02$) and REM sleep ($P < .005$ and 5). The frequency of behavioral arousals was decreased with swaddling during QS ($P < .001$) but not REM sleep. The progression of sighs to startles was decreased in both QS and REM sleep by swaddling ($P < .003$ and 0.0004). The progression of startles to full arousal was decreased with swaddling in QS but not REM sleep ($P < .006$). The percentage of brief arousals was statistically increased during swaddled compared with unswaddled periods in REM sleep ($P < .05$). The average sleep duration while swaddled was increased in REM sleep ($P < .0005$). There was no difference in duration between the periods in QS ($P > .05$).⁴⁸

SECTION II: STUDIES RELATED TO PROMOTION OF SLEEP PATTERN AMONG NEWBORN BABIES.

Romeo M D, Arpaia C, Lala R M, Cordaro G, Gallini F, Vento G, Mercuri E, Chiaretti A (2023) conducted a study to assess the sleep disorders in Low-Risk Preterm Infants and Toddlers. The aims of the present study are to assess the presence of sleep disorders in a population of very preterm infants at 6-36 months who are at low risk of neurological impairments using the Italian version of the sleep disturbance scale for children (SDSC) adapted for this age group. The study comprised 129 usually developing infants and toddlers as well as 217 low-risk preterm new-borns. The SDSC total and factor scores did not differ between these two baby populations, according to our findings. Low-risk preterm infants and toddlers showed similar incidences of sleep disorders to their term-born peers. 217 preterm infant (104 males and 113 females) that met the inclusion criteria during the study period had a mean gestational age of 27.6 weeks (range: 25–33 weeks). On the Griffiths' Mental Development Scale, every infants reported a score that was within the normal range. The mother of the preterm infants completed the SDSC at an average age of 18 months (range: 6–36 months). The questionnaire was also filled out by the mother of 129 usually developing children (62 male and 67 female) with a median age of 20 months (range 6-36 months). The control group had the same age and gender distribution as the preterm group ($p > 0.05$).³⁶

Dixley A, Ball L H (2023) conducted a study to assess the impact of swaddling upon breastfeeding. The aim of this research is to review the known impacts of swaddling on breastfeeding babies and their mothers, as there have only been two recent studies on the outcomes of swaddling that have reported infant feed-type. We evaluate the research on swaddling in terms of how it affects the physiology and behavior of breastfeeding babies both immediately after birth and as infancy progresses. Infants who are swaddled immediately after delivery had a delayed start to breastfeeding, less successful sucking at the breast, lower intake of breast milk, and increased weight loss than un-swaddled infants. Swaddling visually obscures feeding cues and reduces crying, thereby eliminating two key feeding prompts typically used by parents/carers.³⁷

Cırd G, Şahin E N, Zararsız E G, İsmailoğulları S, Kondolot M (2022) conducted a study to assess the Sleep Patterns of Infants and Effects of Sleep Training: Longitudinal Single Center Experience from Turkey. The aim of this study to determine the sleep habits during infancy and to evaluate the effectiveness of sleep training. There were 127 healthy newborns in this long-term study. Infants were followed up at well-child visits from the

third to the eighteenth month after being randomly allocated to either the intervention group (IG) $n = 33$ or the control group (CG) $n = 94$. The IG received face-to-face sleep instruction during the third month and then at following follow-ups. Every visit, families in both groups completed a comprehensive questionnaire. There was no evidence of bed sharing in the IG. In the IG, rocking was less common throughout each period; however, the difference became statistically significant only at the sixth month ($p=0.006$). The frequency of sleeping in the supine position compared to the side position was higher in the IG than CG at the 3rd, 6th and 9th months ($p=0.013$, $p=0.005$, $p=0.003$; respectively). At 9 and 12 months, bedtime was earlier and the amount of time it took the IG compared to the CG to go asleep following night awakenings ($p=0.009$, $p=0.018$; $p<0.001$, $p=0.002$; respectively).³⁸

Madhushika H G N, Bandara G D T R V W (2021) conducted a study to assessment of the sleeping pattern in healthy infants. The objective of this study to assess the sleep pattern, sleep habits and parental reporting of sleep problems and to examine the factors affecting sleep in a group of healthy infants in Sri Lanka. Two hundred and fifty parent / baby pairs participated in this descriptive cross-sectional study. The age groups for the sample were as follows: one month, three months, six months, nine months, and twelve months. An interviewer-administered sleeping questionnaire and a sleeping chart were used to record the sleeping hours of newborns and gather data from parents and caregivers at well-baby clinics in specific public health midwife (PHM) districts. SPSS version 25 was used to analyze the data. Infants slept for an average of 6.09 hours during the day, 8.47 hours during the night, and 14.26 hours for the whole month. When the infants were 12 months old, their mean sleep duration throughout the day, night, and overall was 2.57 hours, 8.33 hours, and 10.87 hours, respectively. Approximately 12% of babies had total sleep durations not in agreement with the National Sleep Foundation (NSF) 2015 recommendations. Although total sleep bouts decreased with age, 6 months old babies had more sleep bouts than 3 months old babies. Approximately 26.4% of infants were reported to have sleep problems. There was no significant difference in overall sleep time between female and male babies.³⁹

KR B K R, Rashmi B, Maya R (2021) conducted a study to assess the Evaluation of Sleep Patterns and Practices in Healthy Indian Infants. The study aimed of this article was to evaluate sleep patterns and practices in healthy Indian infants. The results revealed that the average bedtime was 21:45 p.m., mean total sleep time 11.65 (± 1.59) hours, night sleep time 8.58 (± 1.70) hours and day sleep time 3.06 (± 1.59) hours. The mean number of awakenings was 3.32 (± 1.57). 43.6% of the babies slept on their back and 88% of the babies slept in their parents' bed. 45.6% of the babies needed to be fed, 31.6% rocked, and 15.2% held to sleep. 41.6% of the parents perceived their baby to be having a sleep problem. The babies whose parents perceived no sleep problems, slept longer at night ($p < 0.001$), had lesser night awakenings ($p < 0.001$) and lesser nocturnal wakefulness ($p < 0.001$) compared to those with a serious to small sleep problem.⁴⁶

K M, Selvam V, Diwakar K, R R V (2018) conducted a study to assess the Effect of nesting on sleep pattern among preterm infants admitted in NICU. This study aimed to investigate the effect of nesting on sleep pattern of infants hospitalized in NICU. Preterm infants are born before 37 weeks of gestation. Their organs are underdeveloped, particularly the brain. Sleep has an important function in baby brain development and

maturation. This crossover clinical research was carried out at a tertiary Neonatal Intensive Care Unit (NICU). Twenty-one preterm infants who met the inclusion criteria were enrolled. They were randomly assigned to two groups: nest and standard procedure. The Neonatal Sleep Assessment Scale was used to assess sleep state. The duration of Total Sleep Time per cycle (TST), as well as the duration of each stage, such as quiet sleep, active sleep, and indeterminate sleep, were recorded and analyzed using the paired t-test. Duration of Total Sleep Time per cycle (TST) and duration of each stage were significantly higher among preterm with nesting than usual procedure of care ($p < 0.001$). Duration of sleep time in each stages shows, duration of active sleep is significantly reduced (34.76) with nesting as compared to routine care (39.55) although which is not significant ($t = 1.134$, $P = 0.270$) there is significant increase in quiet sleep (63.62 ± 17.957) with nesting than with routine care and indeterminate sleep time was increased with nesting as compared with sleep in routine care which is highly significant ($t = 4.570$, $p < 0.001$), ($t = 2.297$, $p = 0.003$) at 0.05 level of significance. The results of this study support the use of nesting aids in increase sleep and duration of quiet sleep and aids in stability of physiological parameters. As a result, using nesting for preterm infants is recommended to improve infant's sleep quality in the NICU.⁴⁰

Nathalie S L, Mavilde d L G P, Ariane F M A, Marta J A, Miriam H T, Eliana M P (2015) conducted a study to assess the Polysomnography assessment of sleep and wakefulness in premature newborns. The aims to describe the total sleep time and its stages, total wake time, heart rate values and oxygen saturation shown by premature infants, and the influence of the periods of the day on sleep and physiological parameters. The results show that the newborns remained asleep for 59.6% of the day, predominantly in quiet sleep, with a higher mean heart rate during wakefulness ($p < 0.001$). No difference was found between the variables related to sleep, physiological parameters and periods of the day, but in the morning a predominance of quiet sleep was observed ($p = 0.002$).⁵⁰

Galland C B, Taylor J B, Elder E D, Herbison P (2011) conducted a study to assess the Normal sleep patterns in infants and children. This is a systematic review of the scientific literature with regard to normal sleep patterns in infants and children (0-12 years). The review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. From questionnaire or diary data from 34 eligible studies, mean and variability data were retrieved for sleep duration, number of night waking, sleep latency, longest sleep period overnight, and number of daytime naps. Within age ranges and groups, meta-analysis was carried out. In addition, best-fit equations for the sleep variables in relation to age were estimated using fractional polynomial regression models. In addition, fractional polynomial regression models were used to estimate best-fit equations for the sleep variables in relation to age. Reference values (means) and ranges (± 1.96 SD) for sleep duration (hours) were: infant, 12.8 (9.7-15.9); toddler/preschool, 11.9 (9.9-13.8); and child, 9.2 (7.6-10.8). The best-fit ($R^2 = 0.89$) equation for hours over the 0-12 year age range was $10.49 - 5.56 [(age/10)^{0.5} - 0.71]$. Meta-regression showed predominantly Asian countries had significantly shorter sleep (1 h less over the 0-12 year range) compared to studies from Caucasian/non-Asian countries. Night waking data provided 4 age-bands up to 2 years ranging from 0 to 3.4 wakes per night for infants (0-2 months), to 0-2.5 per night (1-2 year old's). Sleep latency data were sparse but

estimated to be stable across 0-6 years.⁴¹

Marco C, Agostino A, Furio B (2004) conducted a study to assess the Analysis of Sleep-Stage Characteristics in Full-Term Newborns by Means of Spectral and Fractal Parameters. The aims of this studied the behavior of the fractal dimension during each of the neonatal electroencephalogram (EEG) sleep phases and during the awake state, comparing the results with those of the classical spectral parameters and with zero crossing values. The results revealed that Fractal analysis showed that where rhythmic and regular activity are present, as during quiet sleep, the fractal dimension is low and rises when bioelectric activity is more variable and complex, reaching its maximum value during wakefulness. The discriminative value of this parameter was similar to that of some spectral bands.⁵¹

SUMMARY

This chapter dealt with the review of literature under two sections that was studies related to effect of swaddling technique on sleep pattern among newborn babies and studies related to promotion of sleep pattern among newborn babies.

CHAPTER III

RESEARCH METHODOLOGY

Research methods are the technique researcher use to structure a study and together analyse information relevant to the research question.

In this study, the research method includes: research approach, research design, variables, setting, population, sample and sampling technique, tools (validity and reliability), plan for pilot study, plan for data collection and plan for data analysis.

RESEARCH APPROACH

According to Polit and Beck (1999), “Research approach is a set of orderly, systemic, controlled procedure for acquiring dependable, empirical and typically quantitative information”.¹³

In order to achieve the objectives of the study, a **quantitative approach** was adopted to assess the effect of swaddling technique for promotion of sleep pattern among newborn babies in a selected hospital, Assam.

RESEARCH DESIGN

Research design can be defined as a blueprint to conduct a research study, which involves the description of research approach, study setting, sampling size, sampling technique, tools and method of data collection and analysis to answer specific research questions or for testing research hypotheses.¹²

The study design selected for this study was **True - Experimental pre-test post-test control group design.**

The study design is depicted as below

Group	Pre -Test	Intervention	Post Test
Experimental Group	O1	X	O2
Control Group	O1	-	O2

Table 1: Schematic representation of research design

KEYS:

X – Intervention (swaddling technique for a period of 2 days)

O1 – Pre - test sleep score of experimental and control group was assessed prior to introduction of the intervention with the help of Anders and Chalmian sleep scoring. -

O2 – Post - test sleep score of experimental and control group which was assessed every day for a period of 2 days with the help of Anders and Chalmian sleep scoring. -

VARIABLES

Variables are attributes or characteristics that have more than one value. Variables are qualities, quantities, properties or characteristics of people, thing or situation that changes or vary.¹²

The variables identified in this study –

Dependent Variable – Sleep Pattern among newborn babies.

Independent Variable – Swaddling Technique among newborn babies.

Demographic Variable – Age, Sex, Weight, Types of delivery, Family history of SIDS.

STUDY SETTING

Research setting is the physical, social, or experimental context within which research is conducted. In a research paper, describing this setting accurately is crucial since the results and their interpretation may depend heavily on it.¹⁷

Pilot study - Marwari Maternity Hospital, Assam Main Study - STHG Civil Hospital Morigaon, Assam

STUDY POPULATION

A population is the entire aggregation of all cases in which a researcher is interested. The population criteria establish the target population and the accessible population.⁴²

In this study, population refers to term newborn babies where target population refers to term newborn babies (below 1month) whereas accessible population refers to term newborn babies (below 1month) admitted in postnatal ward of STHG Civil Hospital, Morigaon, Assam.

SAMPLE

A sample is a subset of population, which are the most basic units about which data are collected.⁴³

In this study, the sample comprises of the term newborn babies (below 1month) in a selected hospital, Assam and who fulfill the inclusion criteria.

The number of objects that must be chosen from the universe in order to form a sample is known as the sample size. The study's objectives, available resources, respondent, sampling strategy and demographic characteristics, and method of sampling were taken into consideration for determining the sample size.

If the population size is unknown but a lot, the population proportion is known then we have to use Cochran sample size calculation formula.⁴⁵

Sample size calculation was used by using Cochran Formula,

$$n = \frac{p(1-p)z^2}{e^2}$$

where,

n = sample size

p = population proportion

z = z value at significance level or reliability level (for significance level at 95% z = 1.96)

e = accepting error (e= 0.05)

SAMPLE SIZE

Sample size is the number of item to be selected from the universe to constitute a sample.⁴⁴

In this study, the sample size consisted of 60 term newborn babies (experimental group– 30 and control group – 30) and 60 newborn babies who had no major illness.

SAMPLING TECHNIQUE

Sampling technique is a process of selecting a portion of the population to obtain data regarding a problem.⁴⁴

In this study, purposive sampling technique was used for selection of sample.

DESCRIPTION OF THE TOOL

The tool was consist of the following sections:

SECTION A:

DEMOGRAPHIC VARIABLES

It consists of demographic data of the babies which includes: Age of the baby, Sex of the baby, Weight of the baby and Types of delivery, Family history of SIDS.

SECTION B:

ANDERS AND CHALEMIAN SLEEP SCORING

This Tool Has 6 Items Actions Monitored Include:

- 1.**No Fussy-cry (FC):** Vigorous diffuse motor activity and varying intensities of vocalization (crying).
- 2.**No Wakeful activity (WA):** Frequent spurts of diffuse motor activity, open eyes, and occasional grunts and whimpers.
- 3.**No Alert inactivity (AI):** Occasional directed motor actions and wide-open eyes that pursued targets.
- 4.**Not Drowsy (DR):** Relative immobility, absence of focused attention, and opening and closing of the eyelids.
- 5.**Active/REM Sleep (AR):** Rapid eye movements, facial grimacing, writhing body movements, isolated limb twitches, and irregular respiration.
- 6.**Quiet NREM sleep (QS):** Absence of eye movements and body movements except for an occasional startle or burst of non - nutritive sucking, and the presence of regular respiration.⁷

ACTION POINTS

Did not occur - 0 Occurred - 1 **INTERPRETATION**

- Minimum score: 0
- Maximum score for full term new born: 6
- Mild Sleep - 0 – 2
- Moderate Sleep - 3 – 4
- Deep Sleep - 5 – 6

VALIDITY

Validity refers to the degree to which an instrument measures what it is supposed to be measuring.¹⁶

The tools along with content validity were given to 7 (seven) experts at different field.

The expert was 3 (Three) from the Child Health Nursing and 4 (four) Doctors from Pediatric medicine.

The tool was validated in terms of adequacy, relevancy and appropriateness. On each item was 80-100% agreement.

Modification was made on the basis of recommendation; suggestion of the expert and final tools was in corporate with their suggestion of the experts and final tools were reframed as per recommendation

RELIABILITY

It is the degree of consistency and accuracy with which an instrument measures the attributes for which it is designed to measure.¹²

The reliability of the tool was measured by inter-rater method in Anders and Chalemian scales.

ETHICAL CONSIDERATION

The ethical permission for data collection was taken from the following:

The ethical permission was taken from the institutional ethical committee of Assam down town University.

Administrative permission was obtained from Dean, Faculty of Nursing, Assam down town University, Guwahati.

Formal permission for data collection was taken from concerned hospital authority.

Informed consent was taken from the mother of the participants and confidentiality was maintained.

PILOT STUDY

Pilot study is a smaller version of a proposed study conducted to develop and refine the methodology such as treatment, instruments or data collection process to be used in the large study.⁴⁴

The study was conducted from 05/12/23 to 16/12/23 on 20 subjects using purposive sampling technique. The researcher conducted the pilot study in Marwari Maternity Hospital, Assam with 20 newborn babies. The samples were selected and the demographic variables were collected. The study finding revealed that obtained 't' value for effect of swaddling technique for promotion of sleep pattern among newborn babies was 10.3 on 1st day of post -test and 2.32 on 2nd day of post-test which was found to be significant at $p < 0.05$ level of significance. The Pilot study result showed that it was feasible to conduct the study. Findings showed that Swaddling technique was effective for promotion of sleep pattern among newborn babies. The pilot study finding was found to be feasible to conduct main study.

PROCEDURE FOR DATA COLLECTION MAIN STUDY

Setting: Swahid Tilak Hemram Gunabhiram Civil Hospital, (STHG) Morigaon, Assam.

Date: 14th February 2024 – 16th March 2024 after a formal permission from the higher authority of the hospital.

Sample size: 60 samples (Experimental group - 30 and Control group – 30) was collected by using non probability purposive sampling technique.

DATA COLLECTION

The study was conducted from 14/02/24 to 16/03/24 after the researcher obtained Ethical Clearance Certificate from the Ethical Clearance Committee of Assam Down town University, Panikhaiti, Guwahati, Assam. A prior permission was obtained from the Medical Superintendent of the selected Hospital. The study was conducted on 60 samples selected using purposive sampling technique. Further consent was taken from the parent of the participants who allowed their babies to be included in the main Study. The pre-test was conducted on first day to assess the sleep pattern which involved observation of sleep pattern among newborn babies for 24 hours using Anders and Chalemian scales scoring both for the experimental and control group. On 2nd day, intervention was implemented i.e., swaddling technique within 5mins. After administration of intervention, the 1st day post-test was conducted on the same day for 24 hours to note the changes in sleep pattern among newborn babies using the same tool. The 2nd day post-test was conducted in the similar manner as the 1st day of post- test.

PLAN FOR DATA ANALYSIS

Based on the objectives and hypotheses, the obtained data were analyzed by using both descriptive and inferential statistics. The plan for data analysis were as follows-

Descriptive statistics

- Demographic data were analysed in terms of frequency and percentage

Inferential statistics

- Chi-square test were used to determine the association between the pre-test level score of sleep pattern among newborn babies in both experimental group and control group with their selected demographic variables.

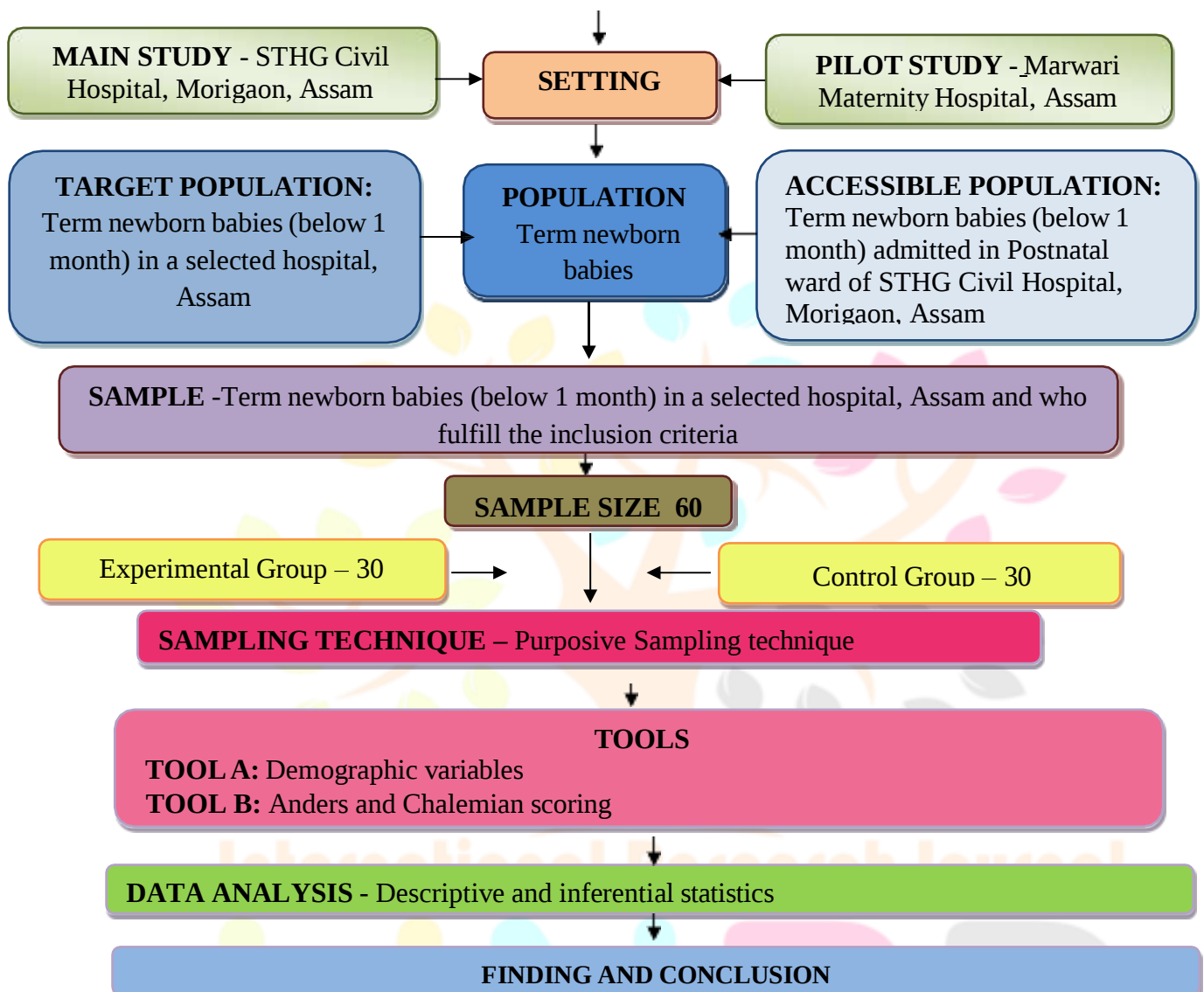


Fig. 2: SCHEMATIC REPRESENTATION FOR RESEARCH METHODOLOGY SUMMARY

The chapter dealt with the research methodology that was adopted for this study. A quantitative approach with True Experimental pre-test post-test control group design was adopted for the study. The sampling technique to be used was simple random sampling technique. It also includes variables of the study, setting of the study, population, sample size, development and description of tool, content validity and tool reliability. The pilot study was conducted in Marwari Maternity Hospital, Assam and Main Study was conducted in STHG Civil Hospital, Morigaon, Assam.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF THE DATA

This chapter deals with the analysis and interpretation of data collected to assess the effect of swaddling technique for promotion of sleep pattern among newborn babies in a selected hospital, Assam.

Analysis is the method of organizing, sorting and scrutinizing data in such a way that research question can be answered or meaningful inferences can be drawn.¹²

Analysis and interpretation of data for the present data collected from the newborn babies in a selected hospital, Assam for assess the effect of swaddling technique for promotion of sleep pattern among newborn babies in a selected hospital, Assam.

OBJECTIVES OF THE STUDY

- 1) To assess the sleep pattern among newborn babies in both the experimental and control group in a selected hospital, Assam.
- 2) To determine the effect of swaddling technique for promotion of sleep pattern among newborn babies in the experimental group in a selected hospital, Assam.
- 3) To find out the association between the pre-test level score of sleep pattern among newborn babies in both experimental group and control group with their selected demographic variables.

HYPOTHESES

H₁ – There is significant mean difference between the pre-test and post-test score of sleep pattern among newborn babies in the experimental group.

H₂ - There is significant mean difference in the post-test scores of sleep pattern among newborn babies between the experimental and the control group.

H₃– There is significant association between pre-test score of sleep pattern among newborn babies in both experimental group and control group with their selected demographic variables.

NULL HYPOTHESES

H₀₁ -There is no significant mean difference between the pre-test and post-test score of sleep pattern among newborn babies in the experimental group.

H₀₂ - There is no significant mean difference in the post-test scores of sleep pattern among newborn babies

between the experimental and the control group.

H₀₃ - There is no significant association between pre-test score of sleep pattern among newborn babies in both experimental group and control group with their selected demographic variables.

PRESENTATION OF DATA

The data collected from 60 newborn babies (below 1 month) were organized and presented for analysis according to the objective of the study under the following section:

SECTION I: This section deals with the frequency and percentage distribution of Demographic Variables of newborn babies in both experimental group and control group.

SECTION II: This section deals with the frequency and percentage distribution of the effect of swaddling technique for promotion of sleep pattern among newborn babies in a selected hospital, Assam.

SECTION III: This section deals with the effect of swaddling technique for promotion of sleep pattern among newborn babies in experimental group in a selected hospital, Assam.

SECTION IV: This section deals with Compare the post-test scores of sleep pattern among newborn babies between the experimental group and the control group.

SECTION V: This section deals with the association between the pre-test level score of sleep pattern among newborn babies in both experimental group and control group with their selected demographic variables.

SECTION I: THIS SECTION DEALS WITH THE FREQUENCY AND PERCENTAGE DISTRIBUTION OF DEMOGRAPHIC VARIABLES OF NEWBORN BABIES.

The sample of the study consisted of 60 participants among newborn babies admitted in postnatal ward, Morigoan, Assam. In this section the data were analysed by using descriptive statistics and presented in terms of frequency and percentage distribution.

Table 2: Frequency and percentage distribution of newborn babies according to their sex of the baby, weight of the baby, type of delivery and family history of SIDS-

N=60

SL. No	Demographic Variables	Frequency (f)	Percentage (%)
1	Sex of the baby		
	a.Male	35	58.3
	b.Female	25	41.7
2	Weight of the baby		
	a.<2.5kg	10	16.7
	b.>2.5kg	50	83.3
3	Type of delivery		
	a.Normal	25	41.7
	b.Caesarean	35	58.3

4	Family history of SIDS		
	a. Yes	10	16.7
	b.No	50	83.3

Table 2 Data analysis shows that out of 60 newborn babies, most of the sample were male i.e., 35 (58.3%) and female i.e., 25 (41.7%), majority samples were >2.5kg i.e., 50 (83.3%) and <2.5kg i.e., 10 (16.7%), majority samples were caesarean i.e., 35 (58.3%) and normal delivery i.e., 25 (41.7%), majority samples have no family history of SIDS i.e., 50 (83.3%) and yes family history of SIDS i.e., 10 (16.7%).

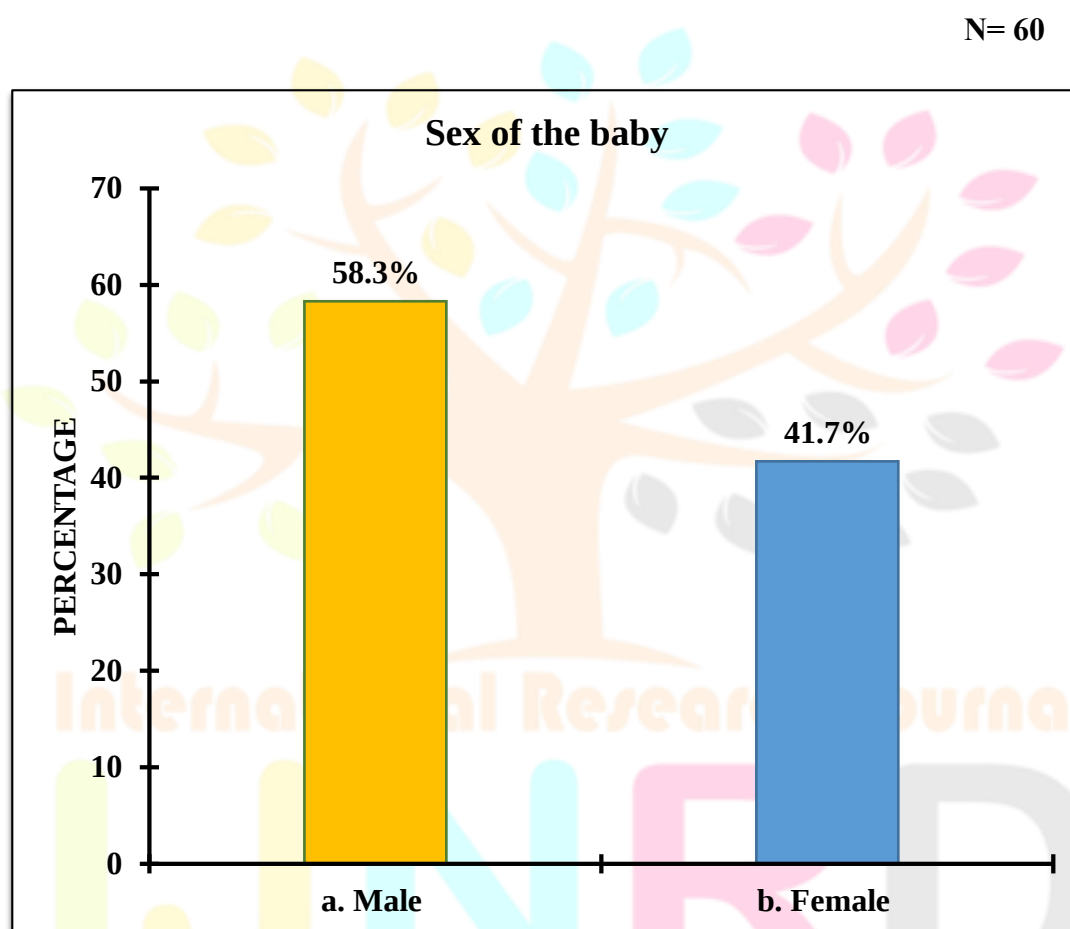


Figure 3.1: Bar diagram showing percentage distribution of sex of the baby

N= 60

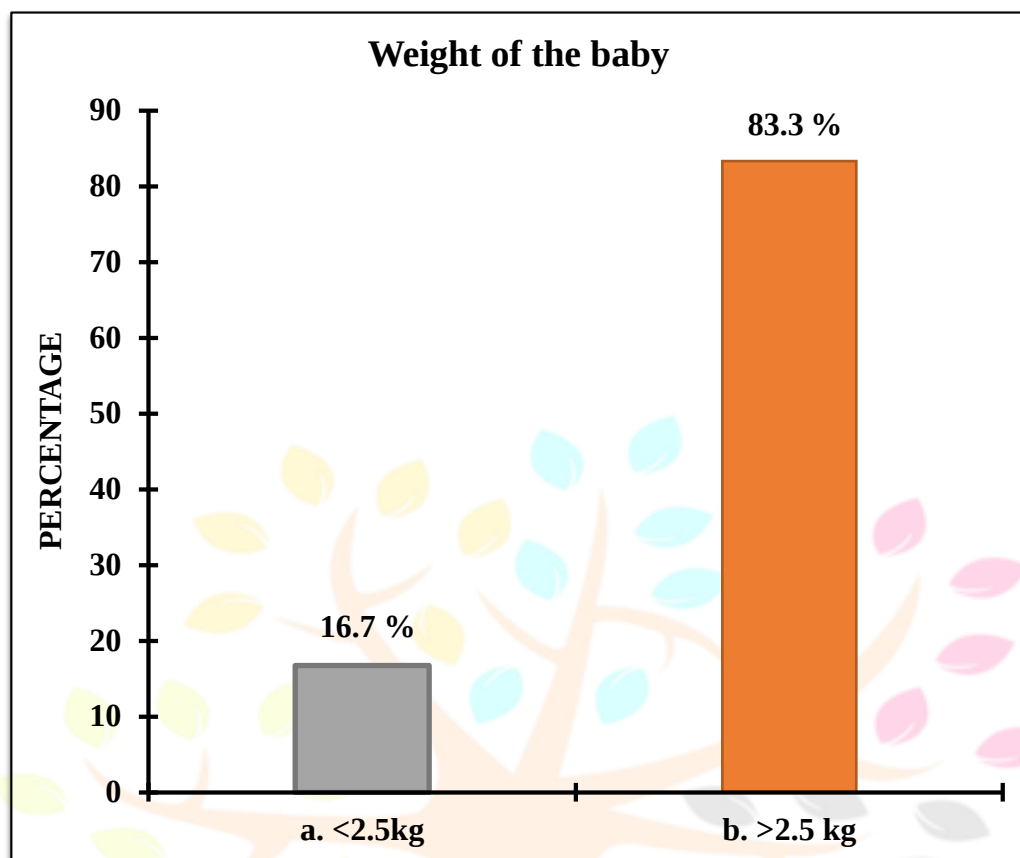


Figure 3.2: Bar diagram showing percentage distribution of weight of the newborn babies

N= 60

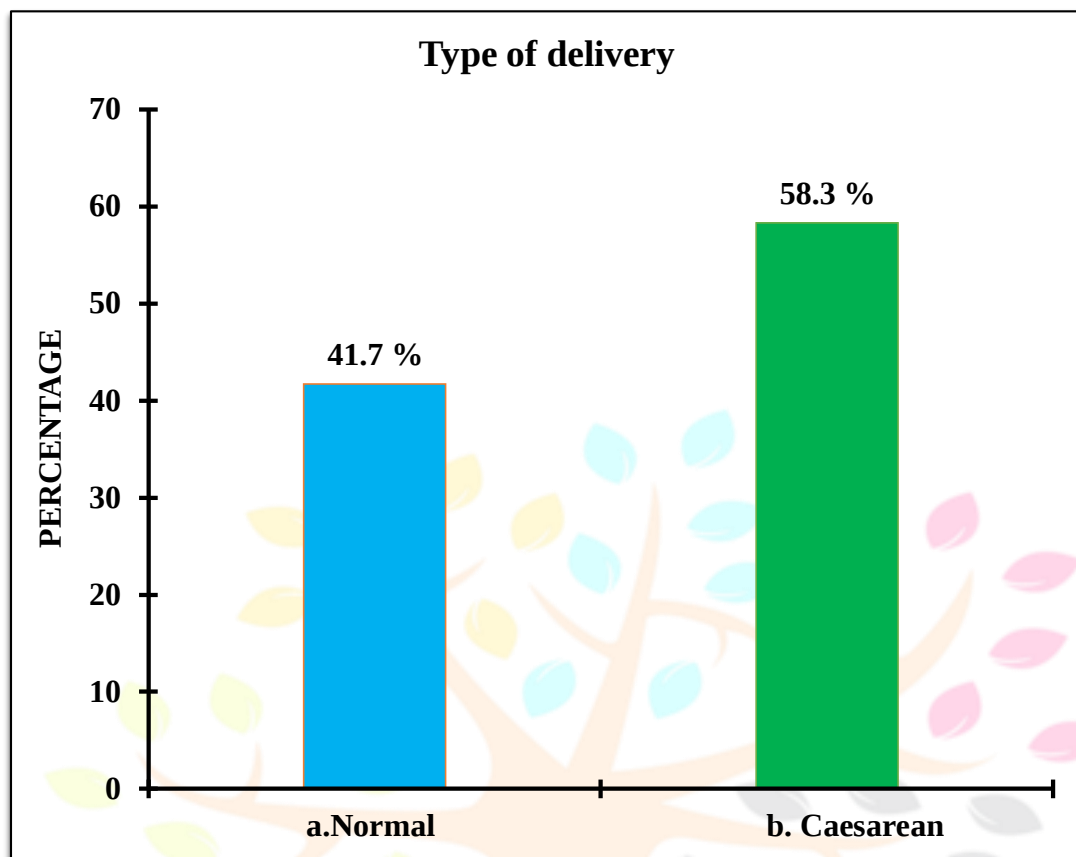


Figure 3.3: Bar diagram showing percentage distribution of type of delivery of newborn babies

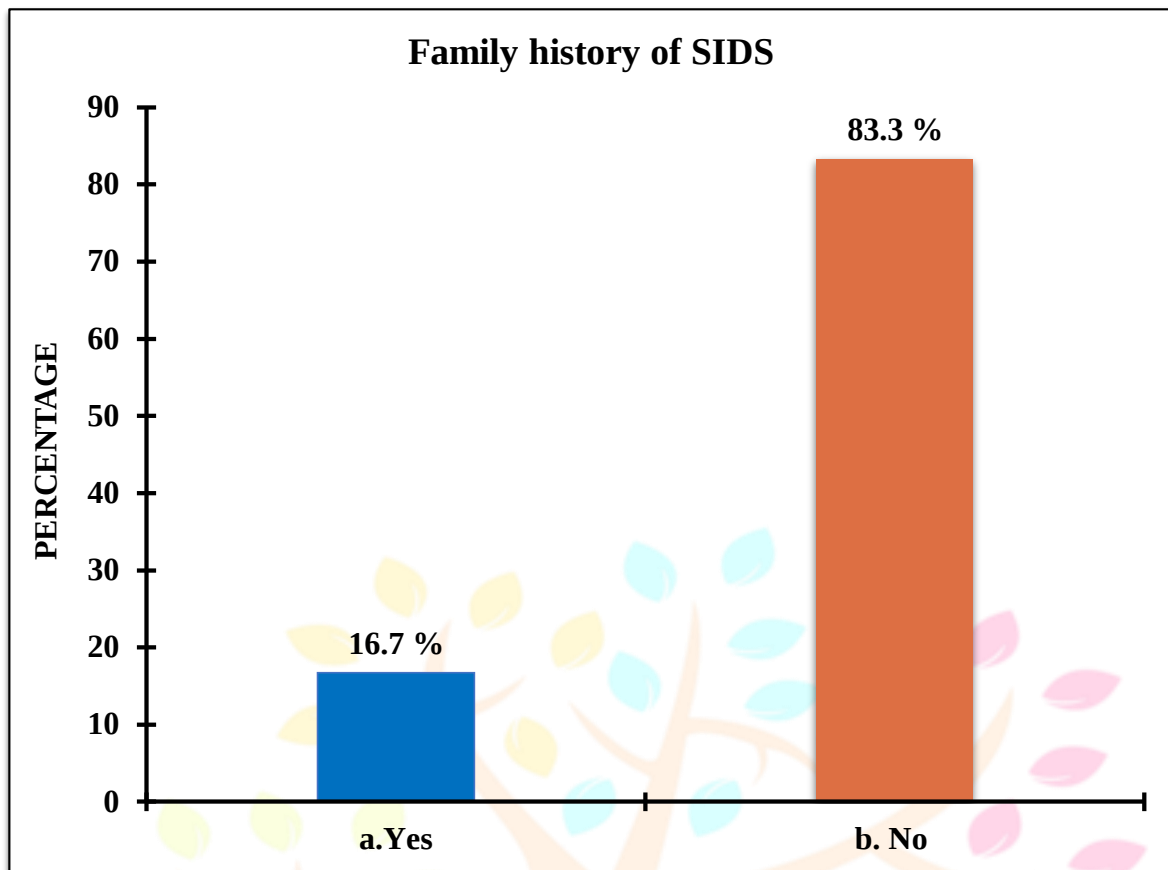


Figure 3.4: Bar diagram showing percentage distribution of having family history of SIDS

SECTION II: THIS SECTION DEALS WITH THE FREQUENCY AND PERCENTAGE DISTRIBUTION OF THE EFFECT OF SWADDLING TECHNIQUE FOR PROMOTION OF SLEEP PATTERN AMONG NEWBORN BABIES IN A SELECTED HOSPITAL, ASSAM.

In this section the effect of swaddling technique was assessed by using Anders and Chalemian sleep scoring among 30 experimental group in newborn babies admitted in postnatal ward, Morigoan, Assam. The sleep pattern were categorized as mild sleep, moderate sleep, deep sleep.

Frequency and percentage distribution of the effect of swaddling technique for promotion of sleep pattern among newborn babies in experimental group is presented in table

Table 3: Frequency and percentage distribution of the effect of swaddling technique for promotion of sleep pattern among newborn babies in Experimental Group -

$n_1=30$

Interpretation	Pre-test		Post-test 1 st Day		Post-test 2 nd Day	
	f	%	f	%	f	%
Mild Sleep (0-2)	5	16.7	2	6.7	1	3.3
Moderate Sleep (3-4)	24	80	22	73.3	14	46.7
Deep Sleep (5-6)	1	3.3	6	20	15	50

Table 3: The data analysis shows that based on the duration of sleep cycle, the scores were classified under into 3 group. Mild Sleep (0-2), Moderate Sleep (3-4), Deep Sleep (5-6) based on the Anders and Chalemian sleep scoring. In Pre-test Deep sleep 1 (3.3%), moderate sleep 24 (80%) and mild sleep 5 (16.7%). In Post-test 1st day Deep sleep 6 (20%), moderate sleep 22 (73.3%) and mild sleep 2 (6.7%). In Post-test 2nd day Deep sleep 15 (50%), moderate sleep 14 (46.7%) and mild sleep 1 (3.3%) in the experimental group.

Table 4: Frequency and percentage distribution of the effect of swaddling technique for promotion of sleep pattern among newborn babies in Control Group-

$n_2=30$

Interpretation	Pre-test		Post-test 1 st Day		Post-test 2 nd Days	
	f	%	f	%	f	%
Mild Sleep (0-2)	16	53.3	14	46.7	13	43.3
Moderate Sleep (3-4)	12	40	13	43.3	14	46.7
Deep Sleep (5-6)	2	6.7	3	10	3	10

Table 4 The data analysis shows that based on the duration of sleep cycle, the scores were classified under into 3 group. Mild Sleep (0-2), Moderate Sleep (3-4), Deep Sleep (5-6) based on the Anders and Chalemian sleep scoring. In Pre-test Deep sleep 2 (6.7%), moderate sleep 12 (40%) and mild sleep 16 (53.3%). In Post-test 1st day Deep sleep 3 (10%), moderate sleep 13 (43.3%) and mild sleep 14 (46.7%). In Post-test 2nd day Deep sleep 3 (10%), moderate sleep 14 (46.7%) and mild sleep 13 (43.3%) in the Control group.

SECTION III: THIS SECTION DEALS WITH THE EFFECT OF SWADDLING TECHNIQUE FOR PROMOTION OF SLEEP PATTERN AMONG NEWBORN BABIES IN EXPERIMENTAL GROUP IN A SELECTED HOSPITAL, ASSAM.

The effect of Pre-test and post-test level of sleep score among newborn babies in experimental group were tabulated in terms of mean, standard deviation, mean difference, paired 't' test and 'p' value.

Table 5: Effect of swaddling technique for promotion of sleep pattern among newborn in experimental group-n₁=30

Effect of swaddling technique in experimental group	Mean	SD	Mean difference	't' test value	df	'p' value	inference
Pre-test	3.2	±0.76	0.6	3.16	29	0.003675	S*
Post-test 1 st Day	3.8	±0.80					

S*=Significant at $p<0.05$ level of significance

NS=Non significant

The table 5 shows the effect of Pre-test and post-test level of sleep score among new- born babies in experimental group. The pre-test mean value of sleep score was 3.2 with SD 0.76 and the post-test 1st day mean value of sleep score was 3.8 with S.D 0.80. The calculated t_{29} value = 3.16 and 'p' value = 0.003675 was found to be statistically significant at $p<0.05$ level. This clearly shows that the administration of swaddling technique among newborn babies for increasing their sleep pattern had significant improvement in their post-test 1st day level of sleep among newborn babies of the experimental group.

Table 6: Effect of swaddling technique for promotion of sleep pattern among newborn in experimental group-n₁=30

Effect of swaddling technique in experimental group	Mean	SD	Mean difference	't' test value	df	'p' value	Inference
Pre-test	3.2	±0.76	1.1	5.09	29	0.0002	S***
Post-test 2 nd Day	4.3	±0.78					

S***=Significant at $p<0.001$ level of significance

NS=Non significant

The table 6 shows the effect of Pre-test and post-test level of sleep score among newborn babies in experimental group. The pre-test mean value of sleep score was 3.2 with SD 0.76 and the post-test 2nd day mean value of sleep score was 4.3 with S.D

0.78. The calculated t_{29} value = 5.09 and ' p ' value = 0.0002 was found to be statistically very highly significant at $p<0.001$ level. This clearly shows that the administration of swaddling technique among newborn babies for increasing their sleep pattern had significant improvement in their post-test 2nd day level of sleep among newborn babies of the experimental group.

SECTION IV: THIS SECTION DEALS WITH COMPARE THE POST-TEST SCORES OF SLEEP PATTERN AMONG NEWBORN BABIES BETWEEN THE EXPERIMENTAL GROUP AND THE CONTROL GROUP

The post-test scores of sleep pattern among newborn babies between the experimental group and the control group were compare using mean, standard deviation, mean difference, paired 't' test and ' p ' value.

Table 7: Compare the post-test scores of sleep pattern among newborn babies between the experimental group and the control group (1st day)

N=60

Comparison the post test scores of sleep pattern	Mean	SD	Mean Difference	t test value	df	P value	inference
Experimental group	3.8	±0.80	1	5	58	0.00001	S***
Control group	2.8	±0.91					

S***=Significant at $p<0.001$ level of significance

NS=Non significant

The table 7 shows the Comparison of post-test scores of sleep pattern among newborn babies between the experimental and the control group (1st day). Findings showed that post-test mean sleep pattern score in experimental group was 3.8 ± 0.80 and post-test mean sleep pattern score in control group was 2.8 ± 0.91 with mean difference was 1. the comparison was tested using unpaired t test with obtained t value was 5 at $df=58$ was statistically very highly significant at $p<0.001$ level. Findings revealed that swaddling technique was

effective for promotion of sleep pattern among newborn babies in experimental group as compared to control group.

Table 8: Comparison the post-test scores of sleep pattern among newborn babies between the experimental group and the control group (2nd day)

N=60

Comparison the post test scores of sleep pattern	Mean	SD	Mean Difference	t test value	df	P value	inference
Experimental group	4.3	±0.78	1.4	7	58	0.00001	S***
Control group	2.9	±0.93					

S*=Significant at $p<0.001$ level of significance**

NS=Non significant

The table 8 shows the Comparison of post-test scores of sleep pattern among newborn babies between the experimental and the control group (2nd day). Findings showed that post-test mean sleep pattern score in experimental group was 4.3 ± 0.78 and post-test mean sleep pattern score in control group was 2.9 ± 0.93 with mean difference was 1.4. The comparison was tested using unpaired t test with obtained t value was 7 at $df=58$ was statistically very highly significant at $p<0.001$ level. Findings revealed that swaddling technique was effective for promotion of sleep pattern among newborn babies in experimental group as compared to control group.

Research Through Innovation

Table 9: Association between the pre-test level score of sleep pattern among newborn babies in both experimental group and control group with their selected demographic variables –

N= 60

Sl. no	Demographic variables	Pre-test			χ^2 value	df	'p' value	Inference
		Mild sleep	Moderate sleep	Deep sleep				
1.	Sex of the baby a. Male b. Female	7 7	25 17	3 1	2.7716	2	0.25	NS
2.	Weight of the baby a. <2.5kg b. >2.5kg	1 13	9 33	0 4	0.8857	2	0.64	NS
3.	Type of Delivery a. Normal b. Caesarean	6 8	17 25	2 2	0.8979	2	0.63	NS
4.	Family history of SIDS a. Yes b. No	3 11	7 35	0 4	0.6856	2	0.70	NS

* $p < 0.05$ level of significance

S- Significant

NS- Non significant

Table no. 9 shows the association between the pre-test level score of sleep pattern among newborn babies in experimental group and control group with their selected demographic variables which was tested by using chi-square test. Result showed that sex of the baby, weight of the baby, types of delivery, family history of SIDS were non-significant with pre-test level score of sleep pattern among newborn babies in both experimental group and control group. Therefore, research hypotheses H_2 was rejected and H_{02} was accepted.

SUMMARY

This chapter dealt with the analysis and interpretation of the findings of the study. The data were summarized using descriptive and inferential statistics.

CHAPTER V

SUMMARY, FINDINGS, DISCUSSION, CONCLUSION, IMPLICATIONS, LIMITATIONS AND RECOMMENDATIONS

The present chapter deals with summary, discussion, conclusion and recommendation as per the findings of the study.

SUMMARY

One of the most moving and inspiring events that may happen in a person's life is the birth of a child. After nine months of waiting and planning, the new-born arrives in a whirlwind of excitement. The cornerstone for the quality of parenting is providing new-born with the appropriate care, without any physical or mental impairments. A thin blanket wrapped snugly around the baby's body can resemble the womb and help soothe the new born. When done correctly, swaddling can be an effective technique to help calm new born babies and promote sleep.⁵ It makes a baby feel like he's back inside the womb or like he is being snuggled close. It has been shown to help many babies sleep better. It can be particularly helpful for babies with neurologic problems. It also can really help some parents get their babies to fall and stay asleep on their backs, which is what we recommend to help prevent sudden infant death syndrome (SIDS).

Sleep is a necessary function of life. Studies consistently have shown the importance of sleep in its role for cognitive function and developing memories of babies.³ Swaddling was an almost universal child – care practice before the 18th century. In general, swaddled neonates have shown improved neuromuscular development, less physiologic distress, better motor organization, and more self – regulatory ability while awaking 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 (SIDS), which makes it necessary to alert parents to halt swaddling if neonate attempts to turn.⁴

“A study to assess the effect of swaddling technique for promotion of sleep pattern among newborn babies in a selected hospital, Assam”

The objectives of the study are:

To assess the sleep pattern among newborn babies in both the experimental and control group in a selected hospital, Assam.

To determine the effect of swaddling technique for promotion of sleep pattern among newborn babies in the experimental group in a selected hospital, Assam.

To find out the association between the pre-test level score of sleep pattern among newborn babies in both experimental group and control group with their selected demographic variables.

The study was based on assumption that-

Swaddling technique may help in promotion of sleep among newborn babies.

Mothers may have less knowledge regarding swaddling technique.

The study also attempted to examine the following hypotheses:

Research Hypotheses

H₁ – There is significant mean difference between the pre-test and post-test score of sleep pattern among newborn babies in the experimental group.

H₂- There is significant mean difference in the post-test scores of sleep pattern among newborn babies between the experimental and the control group.

H₃– There is significant association between pre-test score of sleep pattern among newborn in both experimental group and control group babies with their selected demographic variables.

NULL HYPOTHESES

H₀₁ -There is no significant mean difference between the pre-test and post-test score of sleep pattern among newborn babies in the experimental group.

H₀₂ - There is no significant mean difference in the post-test scores of sleep pattern among newborn babies between the experimental and the control group.

H₀₃ – There is no significant association between pre-test score of sleep pattern among newborn babies in both experimental group and control group with their selected demographic variables.

The conceptual Framework selected for this study is based on J.W. Kenny's Open System Model and it provided the comprehensive framework for achieving the objectives of the study.

The researcher used a quantitative approach and True Experimental pre-test post-test control group design assess the effect of swaddling technique for promotion of sleep pattern among newborn babies. 60 samples were selected using purposive sampling technique. The study was conducted in Postnatal ward of STHG Civil

Hospital, Morigaon, Assam.

The tool used for research study was Standardized tool (Anders and Chalemian scales)

The reliability of the tool was measured by inter-rater method in Anders and Chalemian scales.

The pilot study findings revealed feasibility of the tool and the practicability of the study.

The main study was conducted after obtaining permission from concerned authority of Swahid Tilak Hemram Gunabharam Civil Hospital, (STHG) Morigaon, Assam. The data collected were analysed using descriptive and inferential statistics.

MAJOR FINDINGS OF THE STUDY

The following are the major findings of the study:

DEMOGRAPHIC DATA

The majority of the samples were male 35 (58.3%) and female 25 (41.7%).

The majority samples were <2.5kg i.e., 10 (16.7%) and >2.5kg i.e., 50 (83.3%).

The majority samples were normal delivery i.e., 25 (41.7%) and caesarean i.e., 35 (58.3%).

The majority samples were yes family history of SIDS i.e., 10 (16.7%) and no family history of SIDS i.e., 50 (83.3%).

ASSESS THE SLEEP PATTERN AMONG NEWBORN BABIES IN EXPERIMENTAL GROUP IN A SELECTED HOSPITAL, ASSAM

The findings of the present study revealed that in Pre- test, majority of the samples were having moderate sleep score 24 (80%), mild sleep score 5 (16.7%) and deep sleep score 1 (3.3%). In post-test 1st day, moderate sleep score 22 (73.3%), deep sleep score 6 (20%) and mild sleep score 2 (6.7%). In Post-test 2nd day deep sleep score 15 (50%), moderate sleep score 14 (46.7%) and mild sleep score 1 (3.3%) in the experimental group.

ASSESS THE SLEEP PATTERN AMONG NEWBORN BABIES IN CONTROL GROUP IN A SELECTED HOSPITAL, ASSAM

In Pre-test mild sleep score 16 (53.3%), moderate sleep score 12 (40%) and deep sleep score 2 (6.7%). In Post-test 1st day mild sleep score 14 (46.7%), moderate sleep score 13 (43.3%) and deep sleep score 3 (10%). In Post-test 2nd day moderate sleep score 14 (46.7%), mild sleep score 13 (43.3%) and mild sleep score 3 (10%) in the Control group.

EFFECT OF SWADDLING TECHNIQUE FOR PROMOTION OF SLEEP PATTERN AMONG NEWBORN BABIES IN EXPERIMENTAL GROUP

The present study revealed that mean pre-test sleep pattern score was 3.2 and mean post-test 1day sleep pattern score was 3.8. The calculated t_{29} value = 3.16 and p -value = 0.003675 was significant at $p < 0.05$, thus the research hypotheses (H_1) was accepted. Therefore, swaddling technique was proved to significantly for promotion of sleep pattern among newborn babies in Experimental Group.

COMPARE THE POST-TEST SCORES OF SLEEP PATTERN AMONG NEWBORN BABIES BETWEEN THE EXPERIMENTAL GROUP AND THE CONTROL GROUP

The present study revealed that post-test mean sleep pattern score in experimental group was 3.8 ± 0.80 and post-test mean sleep pattern score in control group was 2.8 ± 0.91 with mean difference was 1. the comparison was tested using unpaired t test with obtained t value was 5 at $df = 58$ was statistically very highly significant at $p < 0.001$ level. Findings revealed that swaddling technique was effective for promotion of sleep pattern among newborn babies in experimental group as compared to control group.

ASSOCIATION BETWEEN THE PRE-TEST LEVEL SCORE OF SLEEP PATTERN AMONG NEWBORN BABIES IN EXPERIMENTAL GROUP WITH THE SELECTED DEMOGRAPHIC VARIABLES

The association between the pre-test level score of sleep pattern among newborn babies in experimental group with their selected demographic variables which was tested by using chi-square test. Result showed that sex of the baby, weight of the baby, types of delivery, family history of SIDS were non-significant with pre-test level score of sleep pattern among newborn babies in experimental group.

DISCUSSION

The findings of the study have been discussed with reference to the objectives, hypotheses and findings from other study.

CHARACTERISTIC OF DEMOGRAPHIC VARIABLES OF NEWBORN BABIES

The frequency and percentage distribution of selected demographic variables of newborn babies show that out of 60 participants, the majority of the samples were male 35 (58.3%) and female 25 (41.7%). The majority samples were $< 2.5\text{kg}$ i.e. 10 (16.7%) and $> 2.5\text{kg}$ i.e., 50 (83.3%). The majority samples were normal delivery

i.e., 25 (41.7%) and caesarean i.e., 35 (58.3%). The majority samples were yes family history of SIDS i.e., 10 (16.7%) and no family history of SIDS i.e., 50 (83.3%).

ASSESS THE SLEEP PATTERN AMONG NEWBORN BABIES IN EXPERIMENTAL GROUP IN A SELECTED HOSPITAL, ASSAM

The findings of the present study revealed that in Pre- test, majority of the samples were having moderate sleep score 24 (80%), mild sleep score 5 (16.7%) and deep sleep score 1 (3.3%). In post-test 1st day, moderate sleep score 22 (73.3%), deep sleep score 6 (20%) and mild sleep score 2 (6.7%). In Post-test 2nd day deep sleep score 15 (50%), moderate sleep score 14 (46.7%) and mild sleep score 1 (3.3%) in the experimental group.

ASSESS THE SLEEP PATTERN AMONG NEWBORN BABIES IN CONTROL GROUP IN A SELECTED HOSPITAL, ASSAM

In Pre-test mild sleep score 16 (53.3%), moderate sleep score 12 (40%) and deep sleep score 2 (6.7%). In Post-test 1st day mild sleep score 14 (46.7%), moderate sleep score 13 (43.3%) and deep sleep score 3 (10%). In Post-test 2nd day moderate sleep score 14 (46.7%), mild sleep score 13 (43.3%) and mild sleep score 3 (10%) in the control group.

The present study is supported by the study conducted by Bhaisare P, Sawant S, Mahapure D, Modak P, Landge H, Khadse J, Katalkar V (2024) to assess the effect of swaddling on quality of sleep among neonate. The findings of the study revealed that in the experimental group, all the neonates had deep sleep (score 5-6). In control group, 56% of the neonates had mild sleep (score ≤ 2) and 44% of them had moderate sleep (score 3-4). Average quality of sleep score among neonates in experimental group was significantly higher than that among neonates in control group.²⁶

EFFECT OF SWADDLING TECHNIQUE FOR PROMOTION OF SLEEP PATTERN AMONG NEWBORN BABIES IN EXPERIMENTAL GROUP

The present study revealed that mean pre-test sleep pattern score was 3.2 and mean post-test 1day sleep pattern score was 3.8. The calculated t_{29} value = 3.16 and p -value = 0.003675 was significant at $p < 0.05$, thus the research hypotheses (H_1) was accepted. Therefore, swaddling technique was proved to significantly for promotion of sleep pattern among newborn babies in experimental group.

The finding was supported by a study conducted by J.S. A. R (2021) conducted a Quasi – experimental study to assess the effectiveness of swaddling technique on promotion of sleep pattern among new-borns at Ashwin hospital, Coimbatore. Results: In experimental group, the pre-test mean value of sleep score was 58.87 with

S.D 9.06 and the post-test mean value of sleep score was 114.07 with S.D 27.7. The calculated paired, 't' value of t=11.49 was found to be statistically highly significant at $p<0.05$. In control group, the pre-test mean value of sleep score was 55.23 with S.D 8.86 and the post-test mean value of sleep score was 58.07 with S.D 12.99. The calculated paired 't' value of $t = 1.1$ was found to be not significant with $p=0.274$.⁷

COMPARE THE POST-TEST SCORES OF SLEEP PATTERN AMONG NEWBORN BABIES BETWEEN THE EXPERIMENTAL GROUP AND THE CONTROL GROUP

The present study revealed that post-test mean sleep pattern score in experimental group was 3.8 ± 0.80 and post-test mean sleep pattern score in control group was 2.8 ± 0.91 with mean difference was 1. the comparison was tested using unpaired t test with obtained t value was 5 at $df=58$ was statistically very highly significant at $p<0.001$ level. Findings revealed that swaddling technique was effective for promotion of sleep pattern among newborn babies in experimental group as compared to control group.

The present study is supported by the study conducted by Paran M, Edraki M, Montaseri S, Nejad R M (2016) a study to Comparing the Effects of Swaddle and Conventional Bathing Methods on Behavioral Responses in Preterm Neonates. The results demonstrated that the occurrence rates of such behaviors as facial grimace ($p<0.001$), mouthing/yawning movements ($p<0.001$), tongue extension ($p=0.017$), eyes open ($p=0.027$), and fussing/crying ($p<0.001$) were significantly lower in the experimental group than those in the control group. In addition, the percentage of eyes closed was higher in the experimental group, compared to the control group ($p=0.006$).³⁵

ASSOCIATION BETWEEN THE PRE-TEST LEVEL SCORE OF SLEEP PATTERN AMONG NEWBORN BABIES IN EXPERIMENTAL GROUP WITH THE SELECTED DEMOGRAPHIC VARIABLES

The association between the pre-test level score of sleep pattern among newborn babies in experimental group with their selected demographic variables which was tested by using chi-square test. Result showed that sex of the baby, weight of the baby, types of delivery, family history of SIDS were non-significant with pre-test level score of sleep pattern among newborn babies in experimental group.

The present study is supported by the study conducted by Cirdi G, Sahin E N, Zararsiz E G, Ismailogullan S, Kondolot.M (2022) to assess sleep patterns of infants and effects of sleep training. The findings of the study revealed that none of the demographic variables had any significant association with the sleep pattern. The study concludes that sleeping and supine position, earlier bed time shorten the duration to fall asleep.³⁸

CONCLUSION

The present study was conducted to assess the effect of swaddling technique for promotion of sleep pattern among newborn babies in a selected hospital, Assam. The study revealed that for experimental group, the mean pre- test sleep pattern score (3.2) was lower than the mean post-test 1st day sleep pattern score 3.8. The calculated t_{29} value= 3.16 and p -value= 0.003675 was significant at $p<0.05$ and mean post-test 2nd day sleep pattern score was 4.3. The calculated t_{29} value= 5.09 and p -value = 0.0002 was found to be very highly significant at $p<0.001$. The Comparison of post-test scores of sleep pattern among new born babies between the experimental and the control group (1st day). Findings showed that post-test mean sleep pattern score in experimental group was 3.8 ± 0.80 and post-test mean sleep pattern score in control group was 2.8 ± 0.91 with mean difference was 1. the comparison was tested using unpaired t test with obtained t value was 5 at $df=58$ was statistically very highly significant at $p<0.001$ level and the Comparison of post-test scores of sleep pattern among new born babies between the experimental and the control group (2nd day). Findings showed that post- test mean sleep pattern score in experimental group was 4.3 ± 0.78 and post-test mean sleep pattern score in control group was 2.9 ± 0.93 with mean difference was 1.4. The comparison was tested using unpaired t test with obtained t value was 7 at $df=58$ was statistically very highly significant at $p<0.001$ level. Thus, Swaddling technique was effective for promotion of sleep pattern among newborn babies. Swaddling technique helps to improve well-being and proper growth and development of the newborn babies.

NURSING IMPLICATIONS

The researcher has drawn some important implication concern to the fields of nursing practices, nursing education, nursing administration, and nursing research.

NURSING PRACTICE

The nurse has an important role in the management of sleep among newborn babies. The results of this study was assist nurses in managing a newborn's sleep in a clinical setting by using swaddling technique in a hospital. This evidence-based practice can help the nurse to provide the newborn with high quality care. This study supports the use of the swaddling technique by nurse practitioners to improve newborn babies sleep pattern. It makes the nurse more knowledgeable and skillful in assessing sleep pattern among newborn babies.

NURSING ADMINISTRATION

Nursing administration is challenged to meet the health needs of the most vulnerable population through effective organization. This group includes newborns. The nurse administrator can create a policy and protocol for applying the swaddling technique as one of the techniques for promoting newborn sleep.

NURSING EDUCATION

Education is essential for changing the attitudes and behaviors of both practicing nurses and student nurses. Non-pharmacological management of newborn sleep should be included in the nursing curriculum and procedures in the nursing practice manual. They will be able to learn about the swaddling technique and its effectiveness to improve sleep, and they can utilize in the clinical setting.

NURSING RESEARCH

This study is culturally acceptable and provides more information and studies that need to be conducted in various settings. Finding from the current study can be use to further similar studies in different group of simple i.e low birth weight baby, pre-term baby etc.

LIMITATION OF THE STUDY

Some mothers were reluctant to grant permission to let their baby to be included in the research study due to lack of knowledge, fear of unknown etc.

RECOMMENDATIONS

The following recommendations are made based on the present study:

A similar study can be conducted for newborn babies who are enduring invasive procedures that are painful.

A similar study can be conducted for newborn babies who are experiences post operative surgery pain.

A similar study can be conducted in community setting apart from hospital setting.

SUMMARY

This chapter represents a summary of the research study, major findings, discussion, conclusions, implications, limitation and recommendations for further study.

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APPENDIX- A(i)

LETTER SEEKING PERMISSION FROM THE DEAN TO CONDUCT

RESEARCH STUDY



ASSAM
down town
UNIVERSITY

Assam down town University

Permission Granted Via The Assam Act, No. VIII of 2010, Gazette No. LGL 9/2010/11
Sankar Madhab Path, Gandhi Nagar, Panikhaiti, Guwahati-781026, Website : www.adtu.in

Promoted by : **down town**
Charity Trust

Memo No:FN/Adtu/RecPermission/002/2023

LETTER SEEKING PERMISSION FROM DEAN TO CONDUCT RESEARCH STUDY

From,
Ms. Puja Gayen
M.Sc. Nursing 2nd Year,
Faculty of Nursing
Assam down town University,
Panikhaiti, Guwahati, Assam.

Date: 16/11/23

To,
Prof. (Dr) Manashi Sengupta
Dean
Faculty of Nursing,
Assam down town University.

Subject: Permission letter for conducting research study.

Respected Madam,

I, Ms. Puja Gayen, M.Sc. Nursing 2nd Year student of Faculty of Nursing have to submit a dissertation to Assam down town University (AdtU), Panikhaiti, Assam as a partial fulfilment for the award of M.Sc. Nursing degree.

The topic selected for my research study is titled as *"A study to assess the effect of swaddling technique for promotion of sleep pattern among newborn babies in a selected hospital, Assam."*

I humbly request you to kindly grant me permission to conduct this research study, I shall be grateful to you for your kind consideration.

Thanking you in anticipation.

Puja Gayen
Yours sincerely
Ms. Puja Gayen
M.Sc. Nursing 2nd year

Permitted
Manashi Sengupta
16/11/2023
Dean
Faculty of Nursing
Assam down town University

Regd. Office : down town hospital, Sankardev Path, Dispur, Guwahati-781006, Ph No. : 98641 37777, 0361-2330008

APPENDIX- A(ii)

LETTER SEEKING PERMISSION TO CONDUCT PILOT STUDY



Assam down town University

Permission Granted Via The Assam Act. No. VIII of 2010, Gazette No. LGL 9/2010/11
Sankar Madhab Path, Gandhi Nagar, Panikhailli, Guwahati-781026. Website : www.adtu.in

Promoted by : **down town**
Charity Trust

FN_Adtu/RecPermission/05/2023

LETTER SEEKING PERMISSION FROM CONCERNED AUTHORITY TO CONDUCT PILOT STUDY

From,
Prof. (Dr.) Manashi Sengupta
Dean
Faculty of Nursing
Assam down town University.

Date: 14-11-23

To,
The Director, Medical Services
Marwari Hospitals,
Guwahati, Assam.

Subject: - Request for permission to conduct pilot study.
(Through the proper channel)

Respected Sir/Madam,

I would like to introduce Ms. Puja Gayen, 2nd year M.Sc. Nursing student of Faculty of Nursing. She has to conduct a research project to be submitted to Assam down town University in a partial fulfilment of M.Sc. Nursing degree.

The topic is *"A study to assess the effect of swaddling technique for promotion of sleep pattern among newborn babies in a selected hospital, Assam."*

As per the study, she needs to conduct the pilot study in your esteemed institution. I would be obliged if you kindly grant her permission to carry out the above mentioned study in your esteemed institution. Further information will be furnished by the student personally.

I shall be grateful for your kind consideration and hearty co-operation.
Thanking you in anticipation.

With Regards,

Manashi Sengupta
Manashi Sengupta
Dean
Faculty of Nursing
Assam down town University

Forwarded to HR
SP
14/11/23



Regd. Office : down town hospital, Sankardev Path, Dispur, Guwahati-781006, Ph No. : 98641 37777, 0361-2330008

APPENDIX- A(iii)

LETTER SEEKING PERMISSION TO CONDUCT RESEARCH STUDY



Memo : FN/AdtU/Rec Permission -ext/024/23

From,
Prof. (Dr.) Manashi Sengupta
Dean,
Faculty of Nursing,
Assam down town University.

Date:

To,

The Medical Superintendent
Swahid Tilak Hemram Gunabhiram Civil Hospital
Morigaon, Assam

Subject: - Request for permission to conduct research study.

Respected Sir/Madam,

I would like to introduce Ms. Puja Gayen, 1st year M.Sc. Nursing student of Faculty of Nursing. She has to conduct a research project to be submitted to Assam down town University in a partial fulfillment of M.Sc. Nursing degree.

The topic is *A study to assess the effect of swaddling technique for promotion of sleep pattern among newborn babies in a selected hospital, Assam.*

As per the study, she needs to conduct the research study in your hospital. I would like to request you to kindly grant her permission to carry out the above mentioned study in your esteemed hospital. Further information will be furnished by the student personally.

I shall be grateful for your kind consideration and hearty co-operation.
Thanking you in anticipation.

With Regards,

Prof. (Dr.) Manashi Sengupta
Dean
Faculty of Nursing, AdtU.

Dean
Faculty of Nursing
Assam down town University

Regd. Office : down town hospital, Sankardev Path, Dispur, Guwahati-781006, Ph No. : 98641 37777, 0361-2330008

APPENDIX- B

ETHICAL APPROVAL CERTIFICATE



ASSAM
down town
UNIVERSITY

Assam down town University

Permission Granted Via The Assam Act, No. VIII of 2010, Gazette No. LGL.9/2010/11
Sankar Madhab Path, Gandhi Nagar, Panikhalit, Guwahati-781026, Website : www.adtu.in

Promoted by : **down town**
Charity Trust

Memo No.: AdtU/Ethics/stdnt-lett/2023/047

Date: 16/06/2023

To,

Puja Gayen

ADTU/2022-24/MNU/002

Master of Nursing

Faculty of Nursing

Sub: Institutional Ethics Committee (IEC) - Dissertation Proposal Approval
entitled, **"A Study to Assess the Effect of Swaddling Technique for
Promotion of Sleep Pattern Among Newborn Babies in a Selected
Hospital, Assam"**

Dear student,

The above mentioned dissertation proposal was reviewed and discussed in the
Institutional Ethics Committee (IEC) meeting held on 15 and 16 June, 2023
at Assam down town University. IEC has approved your proposal.

(Dr. Seydur Rahman)
Member Secretary
Ethics Committee
Assam down town University

Member Secretary
Ethics Committee
AdtU

(Dr. Giasuddin Ahmed)
Chairman
Ethics Committee
Assam down town University

Chairperson
Ethics Committee
- AdtU

Regd. Office : down town hospital, Sankardev Path, Dispur, Guwahati-781006, Ph No. : 98641 37777, 0361-2330008

APPENDIX- C**CONTENT VALIDITY CERTIFICATE TO WHOM IT MAY CONCERN**

This is to certify that the tools constructed by Ms. Puja Gayen M.Sc. Nursing 2nd Year student, Faculty of Nursing, Assam down town University, to be used in her study title -

“ A study to assess the effect of swaddling technique for promotion of sleep pattern among newborn babies in a selected hospital, Assam.” have been validate by me. I wish success for her future endeavours.

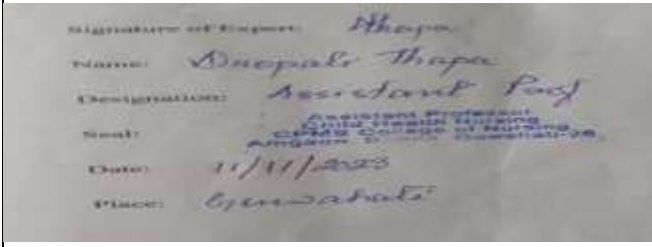
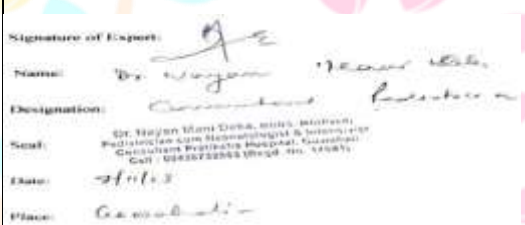
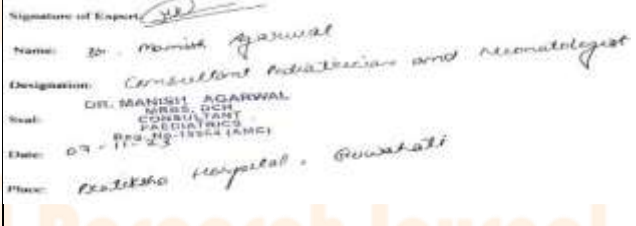
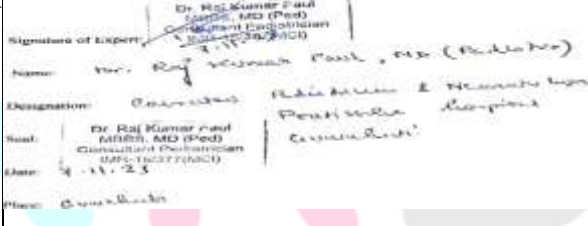
Signature of Expert: Name:

Designation: Seal:

Date: Place:

APPENDIX- D**LIST OF EXPERT**

Sl.No.	List of validation	Signature
1.	Ms. Hishey L. Bhutia Professor Child Health Nursing Sikkim Professional College of Nursing	 Name: <u>Ms. Hishey L. Bhutia</u> Designation: <u>Professor</u> Seal: <u>Sikkim Professional College of Nursing</u> Date: <u>16/11/25</u> Place: <u>Gangtok, Sikkim</u>
2.	Ms. Susmita Sinha Assistant Professor Child Health Nursing Rahman Institute of Nursing and Paramedical Sciences	 Name: <u>SUSMITA SINHA</u> Designation: <u>Asst. prof</u> Seal: <u>Assistant Professor</u> <u>Rahman Institute of Nursing and</u> <u>Paramedical Sciences</u> Date: <u>09/11/2024</u> Place: <u>Guwahati, Assam</u>

3.	Mrs. Dropati Thapa Assistant Professor Child Health Nursing CPMS College of Nursing	 Signature of Expert: <i>Dropati Thapa</i> Name: <i>Dropati Thapa</i> Designation: <i>Assistant Prof</i> Seal: <i>Assistant Professor</i> Date: <i>11/11/2023</i> Place: <i>Gunsabati</i>
4.	Dr. Anit Sonowal Pediatric Consultant Down town Hospital	 Signature of Expert: <i>Anit Sonowal</i> Name: <i>DR ANIT SONOWAL</i> Designation: <i>Pediatrician</i> Seal: <i>Dr Anit Sonowal MBBS DCH</i> Date: <i>27/11/2023</i> Place: <i>Gunsabati</i>
5.	Dr. Nayan Mani Deka Pediatric Consultant Pratiksha Hospital	 Signature of Expert: <i>Nayan Mani Deka</i> Name: <i>Dr. Nayan Mani Deka</i> Designation: <i>Consultant Pediatrician</i> Seal: <i>Dr. Nayan Mani Deka, MBBS, DCH, DNB (Pediatrics)</i> Date: <i>27/11/23</i> Place: <i>Gunsabati</i>
6.	Dr. Manish Agarwal Pediatric Consultant Pratiksha Hospital	 Signature of Expert: <i>Manish Agarwal</i> Name: <i>Dr. Manish Agarwal</i> Designation: <i>Consultant Pediatrician and Neonatologist</i> Seal: <i>DR. MANISH AGARWAL</i> Date: <i>07-11-23</i> Place: <i>Pratiksha Hospital, Gunsabati</i>
7.	Dr. Raj Kumar Paul Pediatric Consultant Pratiksha Hospital	 Signature of Expert: <i>Raj Kumar Paul</i> Name: <i>Dr. Raj Kumar Paul, MD (Pediatrics)</i> Designation: <i>Consultant</i> Seal: <i>Dr. Raj Kumar Paul</i> Date: <i>11/11/23</i> Place: <i>Gunsabati</i>

To,

APPENDIX- E

LETTER REQUESTING VALIDATION OF TOOL

.....

Subject: Request for the opinion and suggestion of experts for establishing content validity of data collection tools.

Respected sir/madam,

I, Puja Gayen, M. Sc Nursing 2nd year student of Assam down town University, Faculty of Nursing, Panikhaiti, in partial fulfilment of the course requirement, has undertaken a research project and I have selected the below mentioned topic for the research project to be submitted to Faculty of Nursing, Assam down town University. **“A study to assess the effect of swaddling technique for promotion of sleep pattern among newborn babies in a selected hospital, Assam.”**

I, therefore request you to kindly go through the content of the following tools for relevancy, adequacy and appropriateness and give your valuable suggestions in the space provided against each item in the criteria checklist. This will enable me to establish content validity of the tool.

TOOL I: Demographic Performa

Here I am enclosing the copies of the following:

- Problem statement
- Objective of the study
- Research tools
- Criteria checklist and
- Certificate for the content validity of the tool. Thanking you in anticipation

Dated:

Place:

Yours faithfully, Ms. Puja Gayen

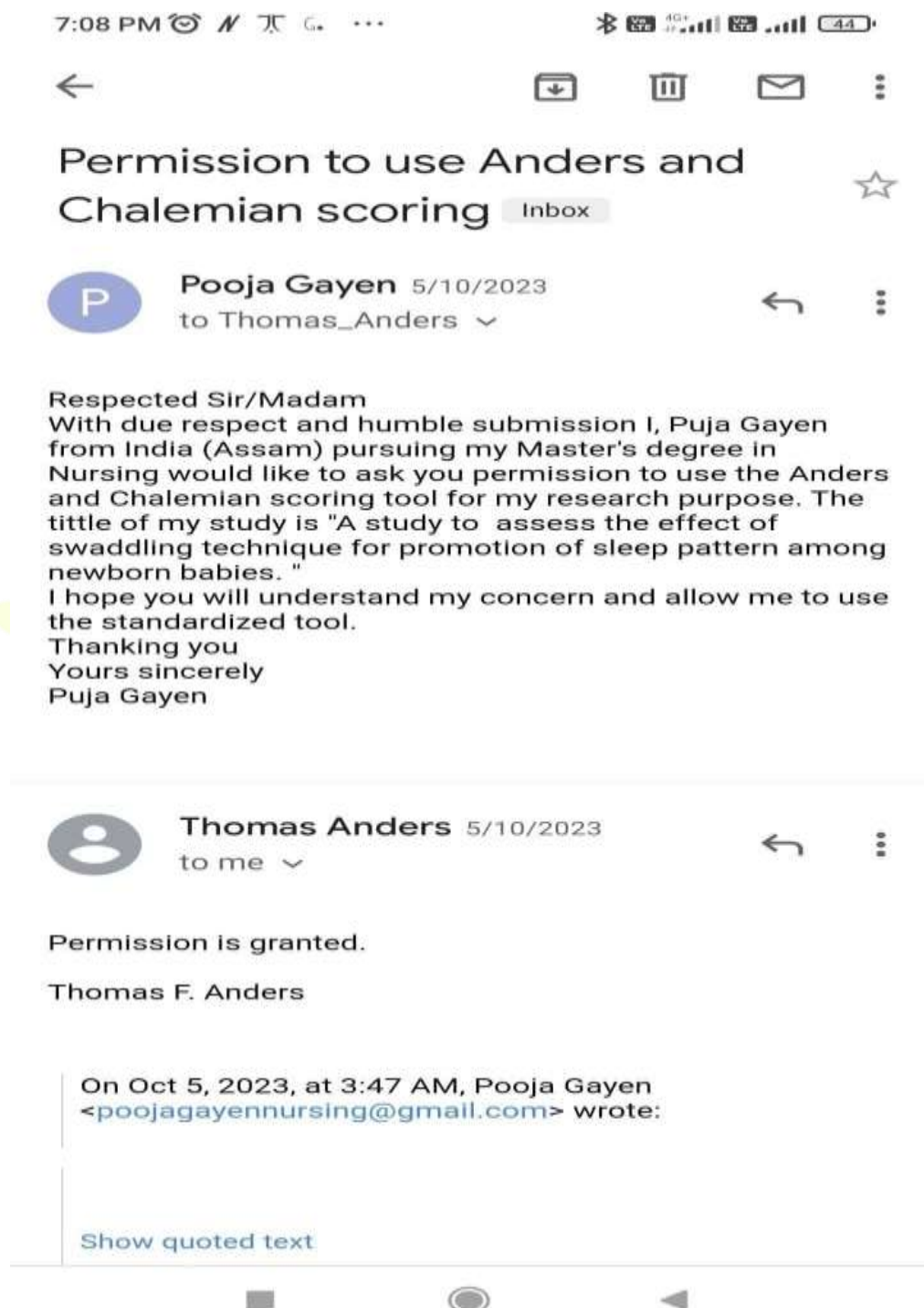
2nd year M.Sc. Nursing student Faculty of Nursing

Assam down town University



APPENDIX- F (i)

PERMISSION TO USE ANDERS AND CHALEMIAN SCORING



APPENDIX- F (ii)**VALIDITY CERTIFICATE OF SWADDLING TECHNIQUE****TO WHOM IT MAY CONCERN**

This is to certify that the content of the swaddling technique used by Ms. Puja Gayen, M. Sc. Nursing student, Faculty of Nursing, Assam down town University, Panikhaiti, Guwahati to be used for her Research study entitled, "**A study to assess the effect of swaddling technique for promotion of sleep pattern among newborn babies in a selected hospital, Assam**" has been validated by me. The swaddling technique has no side effect for promotion of sleep pattern among newborn babies.

Name: *Prof (Dr) Nirmali Gayen*

Designation: *Asso. dean (FRIIC)*

Date: *16/11/23*

Signature and seal:

Nirmali
 Faculty of Nursing
 Assam down town University

Research Through Innovation

APPENDIX- F (iii)

CRITERIA CHECKLIST FOR VALIDATING THE DEMOGRAPHIC VARIABLES

Respected Sir/Madam,

Kindly go through the items enclosed tools and place a tick mark (✓) against each item in the column provided regarding its relevancy, accuracy, and appropriateness.

Sl no.	Relevancy		Accuracy		Appropriateness		Remarks
	Agree	Disagree	Agree	Disagree	Agree	Disagree	
1.							
2.							
3.							
4.							
5.							

SIGNATURE OF VALIDATOR

IJNRD

Research Through Innovation

APPENDIX- F (iv)

**CRITERIA CHECKLIST FOR VALIDATING THE ANDERS AND
CHALMIAN SCORING**

SL.NO.	CATEGORY	SCORE	
		DID NOT OCCUR (0)	OCCURRED (1)
1.	No Fussy-cry (FC)		
2.	No Wakeful activity (WA)		
3.	No Alert inactivity (AI)		
4.	Not Drowsy (DR)		
	TOTAL		

SL.NO.	CATEGORY	SCORE	
		DID NOT OCCUR (0)	OCCURRED (1)
5.	Active/REM Sleep (AR)		
6.	Quiet NREM sleep (QS)		
	TOTAL		

SIGNATURE OF VALIDATOR

APPENDIX – F(v)

TOOL

DEMOGRAPHIC VARIABLES

Instructions: Participants are requested to listen carefully and the interviewer will put (✓) mark to the appropriate option for the response given by the respondent.

a) Sex of the baby -

- i. Male
- ii. Female

b) Weight of the baby -

- i. <2.5 kg
- ii. >2.5 kg

c) Type of delivery

- i. Normal
- ii. Caesarean

d) Family history of SIDS

- i. Yes
- ii. No



APPENDIX – G PARTICIPANT INFORMED CONSENT FORM

INFORMED CONSENT FORM

I _____ understand that I am being asked to allow my daughter/son participate in a research study conducted by Ms. Puja Gayen, M.Sc. Nursing student from Faculty of Nursing, Assam down town university, on topic, ***“A study to assess the effect of swaddling technique for promotion of sleep pattern among newborn babies in a selected hospital, Assam.”*** The study purpose has been explained to me. I realized that study will be beneficial for my child and the participation in this study is entirely voluntary and may withdraw from this study at any time. I understand that all the study data will be utilized only for purpose of this study. I have read and understand this consent form, my entire question has been answered and I agree to participate in this study.

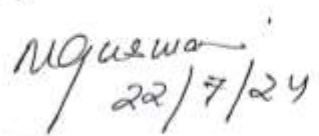
Signature of the parent - _____

APPENDIX-H

CERTIFICATE FOR ENGLISH EDITING FOR RESEARCH STUDY

TO WHOM IT MAY CONCERN

This is to certify that Ms. Puja Gayen, M. Sc. Nursing student, Faculty of Nursing, Assam down town University, Guwahati, Assam has made the necessary editorial changes successfully under my guidance on the topic, " A study to assess the effect of swaddling technique for promotion of sleep pattern among newborn babies in a selected hospital, Assam" and find it appropriate to submit.

Name: Dr MITALI GOSWAMI
Designation: ASSOCIATE PROFESSOR & HOD,
Date: 22/7/24
Signature and seal:  22/7/24

Head
Department of English
University of Science & Technology (USTM)
Meghalaya.

APPENDIX- I
MASTER SHEET ON DEMOGRAPHIC VARIABLES
EXPERIMENTAL GROUP (PRE-TEST)

SAMPLE	D1	D2	D3	D4	D5	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
S1	i	i	ii	ii	ii	1	1	0	0	1	0	3
S2	i	ii	i	ii	ii	0	1	1	0	1	0	3
S3	i	ii	ii	ii	ii	1	1	1	0	1	0	4
S4	i	i	ii	i	i	1	0	1	0	1	0	3
S5	i	i	i	i	ii	1	0	1	0	1	0	3
S6	i	i	ii	ii	i	1	0	1	0	1	0	3
S7	i	ii	ii	ii	ii	1	1	1	0	1	0	4
S8	i	i	ii	ii	ii	1	1	1	0	1	0	4
S9	i	ii	ii	i	ii	0	1	1	0	0	0	2
S10	i	i	ii	i	i	1	0	1	0	0	0	2
S11	i	ii	ii	ii	ii	1	1	0	0	0	0	2
S12	i	i	i	ii	ii	1	1	0	0	1	0	3
S13	i	i	ii	i	i	1	0	1	0	1	0	3
S14	i	i	ii	ii	ii	1	1	1	0	1	0	4
S15	i	ii	ii	i	i	1	1	1	0	1	0	4
S16	i	ii	ii	i	ii	1	1	0	0	1	0	3
S17	i	i	ii	ii	ii	1	0	1	0	1	0	3
S18	i	i	ii	ii	ii	1	0	1	1	1	0	4
S19	i	i	ii	ii	ii	1	0	1	0	1	0	3
S20	i	i	ii	ii	i	0	0	1	0	1	0	2
S21	i	i	ii	ii	ii	0	1	1	0	0	0	2
S22	i	ii	ii	i	ii	1	1	1	0	0	0	3
S23	i	ii	i	i	ii	1	1	1	0	0	0	3
S24	i	i	ii	ii	ii	1	1	1	1	1	0	5
S25	i	i	ii	ii	ii	1	1	0	1	1	0	4
S26	i	ii	ii	ii	ii	1	1	0	0	1	0	3
S27	i	ii	ii	i	ii	1	0	1	0	1	0	3
S28	i	i	ii	ii	ii	1	1	0	1	1	0	4
S29	i	i	ii	i	ii	1	1	1	0	1	0	4
S30	i	i	ii	ii	ii	0	1	1	1	1	0	4

APPENDIX-J (i)

MASTER SHEET OF ANDERS AND CHALMIAN SCORING
EXPERIMENTAL GROUP (POST-TEST -1ST DAY)

SAMPLE	D1	D2	D3	D4	D5	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
S1	i	i	ii	ii	ii	1	1	1	0	1	0	4
S2	i	ii	i	ii	ii	1	1	1	0	1	0	4
S3	i	ii	ii	ii	ii	1	1	1	1	1	0	5
S4	i	i	ii	i	i	1	1	1	1	1	0	5
S5	i	i	i	i	ii	1	1	1	0	1	1	5
S6	i	i	ii	ii	i	1	0	1	1	1	0	4
S7	i	ii	ii	ii	ii	1	1	0	0	1	0	3
S8	i	i	ii	ii	ii	1	0	1	0	1	0	3
S9	i	ii	ii	i	ii	0	1	1	1	1	0	4
S10	i	i	ii	i	i	1	1	1	0	1	0	4
S11	i	ii	ii	ii	ii	1	1	0	1	0	0	3
S12	i	i	i	ii	ii	1	0	1	0	1	0	3
S13	i	i	ii	i	i	1	1	1	0	1	0	4
S14	i	i	ii	ii	ii	1	1	1	0	1	0	4
S15	i	ii	ii	i	i	1	1	0	1	1	0	4
S16	i	ii	ii	i	ii	1	1	0	1	1	0	4
S17	i	i	ii	ii	ii	1	1	1	1	1	0	5
S18	i	i	ii	ii	ii	1	0	0	0	1	0	2
S19	i	i	ii	ii	ii	1	0	1	0	1	0	3
S20	i	i	ii	ii	i	0	1	1	0	1	0	3
S21	i	i	ii	ii	ii	1	1	1	0	1	0	4
S22	i	ii	ii	i	ii	1	1	1	0	1	0	4
S23	i	ii	i	i	ii	1	1	1	0	0	1	4
S24	i	i	ii	ii	ii	1	1	1	1	0	0	4
S25	i	i	ii	ii	ii	1	1	0	1	0	1	4
S26	i	ii	ii	ii	ii	1	1	1	1	1	0	5
S27	i	ii	ii	i	ii	1	0	0	0	1	0	2
S28	i	i	ii	ii	ii	1	1	0	1	1	0	4
S29	i	i	ii	i	ii	1	1	0	1	1	0	4
S30	i	i	ii	ii	ii	1	1	1	1	1	0	5

APPENDIX-J (ii)**MASTER SHEET OF ANDERS AND CHALMIAN SCORING EXPERIMENTAL
GROUP (POST-TEST - 2ND DAY)**

SAMPLE	D1	D2	D3	D4	D5	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
S1	i	i	ii	ii	ii	1	1	1	1	1	0	5
S2	i	ii	i	ii	ii	1	1	1	1	0	1	5
S3	i	ii	ii	ii	ii	1	1	1	0	1	0	4
S4	i	i	ii	i	i	1	1	0	1	1	0	4
S5	i	i	i	i	ii	1	1	1	0	1	0	4
S6	i	i	ii	ii	i	1	0	1	1	1	0	4
S7	i	ii	ii	ii	ii	1	1	1	1	1	0	5
S8	i	i	ii	ii	ii	1	1	1	1	0	1	5
S9	i	ii	ii	i	ii	1	1	1	1	1	0	5
S10	i	i	ii	i	i	1	1	1	1	1	0	5
S11	i	ii	ii	ii	ii	1	1	1	1	0	1	5
S12	i	i	i	ii	ii	1	1	1	0	1	0	4
S13	i	i	ii	i	i	1	1	1	0	1	0	4
S14	i	i	ii	ii	ii	1	1	1	1	1	0	5
S15	i	ii	ii	i	i	1	1	1	1	0	1	5
S16	i	ii	ii	i	ii	1	1	1	1	1	0	5
S17	i	i	ii	ii	ii	1	1	1	1	1	0	5
S18	i	i	ii	ii	ii	1	1	1	1	0	1	5
S19	i	i	ii	ii	ii	1	0	1	1	1	0	4
S20	i	i	ii	ii	i	0	1	1	1	1	0	4
S21	i	i	ii	ii	ii	1	1	0	1	1	0	4
S22	i	ii	ii	i	ii	1	1	0	0	1	0	3
S23	i	ii	i	i	ii	1	0	1	0	0	1	3
S24	i	i	ii	ii	ii	1	0	0	1	0	0	2
S25	i	i	ii	ii	ii	1	0	0	1	0	1	3
S26	i	ii	ii	ii	ii	0	1	1	1	1	0	4
S27	i	ii	ii	i	ii	1	1	0	1	1	0	4
S28	i	i	ii	ii	ii	1	1	1	1	1	0	5
S29	i	i	ii	i	ii	1	1	1	1	0	1	5
S30	i	i	ii	ii	ii	1	1	1	1	1	0	5





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