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ORIGINAL RESEARCH

Nesting Technique: The Effects on Preterm Cardiorespiratory Indicators

Haneen Abdul Hussein Shamkhi [1], Adraa Hussein Shawq [2].

[1] *Pediatric Nursing Department, College of Nursing, University of Baghdad, Baghdad, Iraq.*
[2] *Pediatric Nursing Department, College of Nursing, University of Baghdad, Baghdad, Iraq.*

CORRESPONDING AUTHOR: Haneen Abdul Hussein Shamkhi, Pediatric Nursing Department, College of Nursing, University of Baghdad, Baghdad, Iraq.
Email: hanin.abd2204m@conursing.uobaghdad.edu.iq

ABSTRACT

Background: Premature infant born with immature body system, their organs are not ready for extra uterine life, and they are unable to deal with external stress, which could alter body functions such as cardio-respiratory function. In addition, poor muscle tone increases the chance of developing an abnormal posture. To reduce this instability, applying developmental care such as nesting is vital to promote cardio-respiratory stability, maintain position, and reduce stress in preterm.

Objectives: The study aims to assess the impact of the nesting technique on preterm cardio-respiratory parameters in various positions (supine, prone, and right lateral).

Methodology: The research used randomized controlled trial design. By simple random sampling technique was choose 60 preterm infant, and they were divided into four groups equally (supine, prone, right lateral, and control group). The cardio-respiratory parameters (heart rate, respiratory rate, and oxygen saturation) were measured before and after applying the nesting and positioning techniques for 3 consecutive days. Data were analyzed by Statistical Package for Social Sciences (SPSS) program.

Results: The study results showed a significant difference in the mean score of cardio-respiratory after three days of nesting technique with lateral, supine, and prone position groups at p= 0.000. While the control group showed there was non-significant change in the mean score of HR, RR, and Spo2 at p > 0.05.

Conclusion: The Study concluded that the nesting technique was effective for stabilizing the cardio-respiratory parameters of preterm infants. The authors recommended routinely using nesting with the ideal position technique in preterm as a part of developmental care at the neonatal intensive care unit.

Keywords: Effect; Nesting technique; Cardiorespiratory parameters; Preterm infant.

INTRODUCTION

Preterm neonate is a term used to describe any infant who was born before complete the 37 weeks of pregnancy after the last menstrual cycle (Alwan & Ma'ala, 2021). They are classified according gestational age into four categories: extremely preterm when preterm born with gestation age less than 28th weeks; very preterm born after completed the 28th weeks and before completed the 32th weeks of gestation; when the preterm born after completed the 32th weeks and before completed the 34th weeks of gestation called moderate preterm; while late preterm birth occur after completed the 34th weeks and before completed the 37th week of gestation (Gutvirtz et al., 2022).

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According to the World Health Organization (WHO), around 15 million neonate worldwide are born premature each year (Nayef & Neamah, 2019). Globally, over one in ten deliveries is preterm, with low and middle-income nations having the greatest percentage of premature births (Soleimani et al., 2020).

Preterm birth is the main cause of death in young children, which represents 18% of deaths in children under the age of five years and 35% of deaths in neonates age less than 28 days (Walani, 2020; Ibrahim & Hashem, 2020; Ghafel, 2018). Preterm neonates are usually born with systematic organs that do not develop properly, which influences preterm survival and may cause serious life-threatening consequences (McDonald et al., 2019).

The transition of neonates from intrauterine to extrauterine life is a critical and sensitive period (Rahman et al., 2023). Exposure to short-term consequences, due to an incompetent cardiovascular system that influences the transition from a lower placental circulation resistance to the higher artery circulation resistance after delivery (Lewandowski, 2019). In addition to this, pulmonary insufficiency, weakness in respiratory muscles, immature lung, and a lack of surfactant in the alveoli lead to respiratory problem significantly arise such as respiratory distress syndrome, acidosis, apnea, and hypoxia which lead to more oxygen consumption (Patel et al., 2021).

Moreover, poor physical condition and unstable body function significantly increase the stress of preterm neonates; in response to these factors, their vital signs were disturbed, such heart rate (HR), respiration rate (RR), oxygen saturation rate (Spo2) (Prawesti et al., 2019). Therefore, the preterm neonates require admitted to the neonatal care unit (NICU) to provide particular attention and intensive care to increase the survival rate and reduce serious complications (Spilker et al., 2016; Tuoma & Khalifa, 2021).

The care of high-risk and preterm infant is supported significantly by the nurses (Helal et al., 2022). Nurse plays a major role in promoting high-quality health, preventing complications, and achieving desired out comes (Arrar & Mohammed, 2020; Jassim & Khalifa, 2018; Shauq et al., 2014). Most nursing management uses low-cost, simple techniques like nesting and positioning that improve the preterm cardiorespiratory stability (Sayed & Hassan, 2020).

Nesting is one of the develop-pmental supportive care strategies that can be applied when caring for preterm infant in the NICU. The nest has been wrapped into a "U" or "O" shape to facilitate their proper flexion position, similar to the position in uterus, with hands and feet together near the face and abdomen. In addition to supportive environment, they feel safe and warm, and it help them cope with their stress. Maintaining their comfort level makes it easier to stability vital signs (Sumathy, 2020).

Moreover, positioning in this period is crucial to the developmental care of preterm infant (Al-Bahadli & Al-Mosawi, 2023). Can be placed in prone, supine, and lateral with slightly head-elevated. When the proper positions are taken, the gravity, hydrostatic, and compressional forces acting on the heart, chest wall, lungs, vascular system, blood volume, and diaphragm have a greater influence on the cardiorespiratory system, combine to increase oxygen transport (Salih et al., 2020).

AIMS OF THE STUDY

The study aims to assess the impact of the nesting technique on preterm cardio-respiratory parameters in various positions (supine, prone, and right lateral).

METHODOLOGY

Research design

The study employed a randomized controlled trial design to accomplish its objectives. This method performed the procedure multiple times to provide a

reliable result to determine the effect of independent variable (nesting technique) on dependent variable (cardiorespiratory stability of the preterms). Randomization to reduces bias, while the control is used to reduce the chance of error and raise the probability that the findings of the study reflect accurate reality. The study was carried out NICU Al-Batool Teaching Hospital in Diyala, Iraq. Conducted from 12th September 2023, to 15th April 2024.

Samples and Sampling

A simple random sampling technique was used to choose the 60 preterm infants were divided randomly into three experimental groups (supine, prone, and right lateral nesting position) and one control group was received routine care in NICU only. The randomization procedure involves writing one type care include supine, prone, right lateral, and control groups separately in similar papers regarding the type, size, color, and folding way, these pieces are placed in a container and thoroughly mixed before preterm groups were chosen to ensures unbiased group formation. Based on a Richard Geiger Equivalent; population proportion= 50% represents the highest variability that be expected in the population, error probability= 5% the desired level of precision of the estimate, confidence level= 95 % this is the level of risk we are willing to tolerate, and the standard score corresponding to the level of confidence 1.96, the minimum required sample size would be 15 infant in each of the four groups (supine, prone, right lateral nesting position, and control group).

The inclusion criteria include preterm gestational age 28–36 weeks, a weight 500 – 2500 grams, both gender, and admission to NICU at least for three continues days. While The preterm with respiratory distress syndrome, on mechanical ventilation, continuous positive airway pressure, sepsis, obvious congenital abnormalities, bone fractures, confusion, and medical surgery were excluded from the study.

Measurement and data collection

The data was collected from 10th December 2023 until 10th march 2024. The researcher developed the nest out of soft cloth filled with brocade and belts on both sides and develops in a U shape, as show in figure (1).

Figure (1) nesting technique in different infant position prone, supine, and lateral.

The socio-demographic data of preterm infant were collected, including their gestational age, sex, postnatal age, birth weight, and type of delivery.

A specific chart was developed for each preterm infant to record cardiorespiratory parameters of preterm, including HR, RR, and Spo2 for five times each day. The HR and Spo2 were measured by using a pulse oximeter, and the RR was manually measured. Before applying any care to the infants, the pretest HR, RR, and SPO2 were measured for all groups. Directly applied the nesting and position for experimental groups and routine care for the control group.

At this time, the first trial was begun and continued for two hours; the posttest was measured at the first and second hours of first trial. Following

this, the preterm infant in experimental groups was placed in an unconstrained (free position) for 30 minutes while the control group continued in routine care. After that, the preterm returned to its previous position; the second trial began with two hours, and the parameter was measured again at the first and second hours of second trial, as mentioned in (fig. 2)

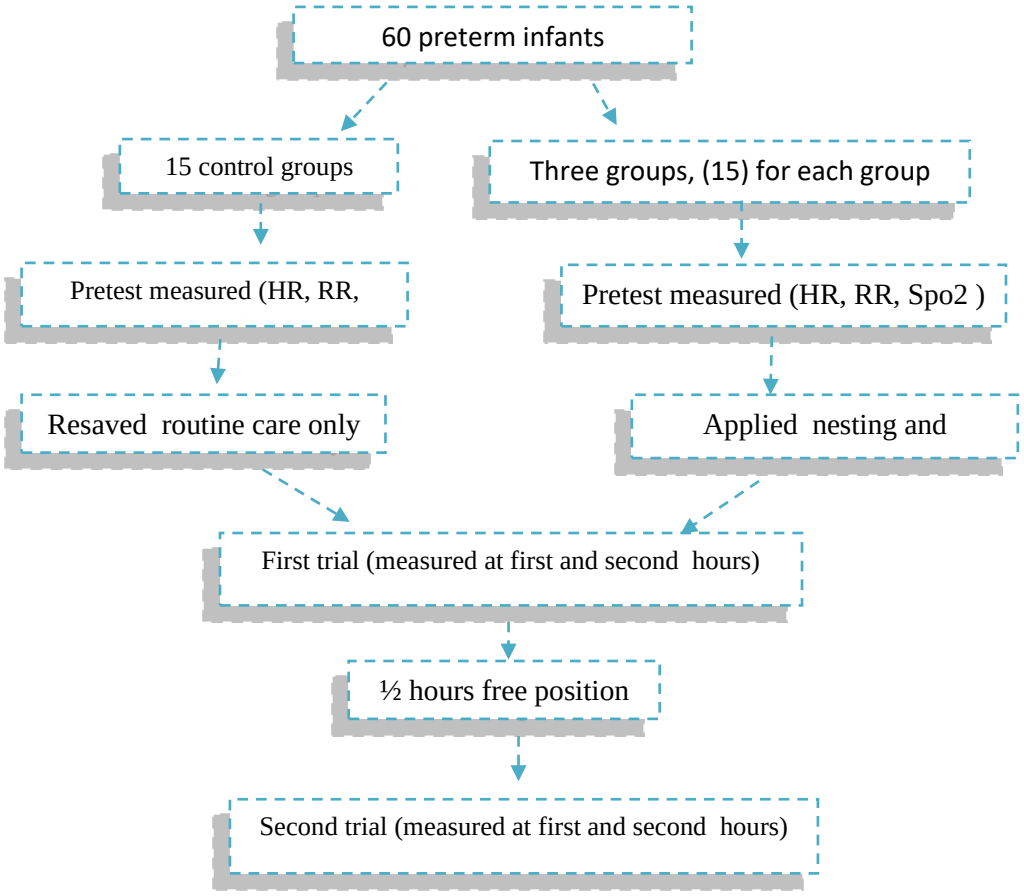

Figure (2): Data Collection Technique

Pilot Study

The Pilot study was performed 9 preterms admitted to the NICU at Al-Batool Teaching Hospital from 14th to 30th October, 2023. Those preterm were excluded from the study sample. The pilot study aims to determine any possible adverse consequences and difficulties that occur throughout the research process and the typical time required to gather data. Ultimately, it provides a chance to assess the tool's accuracy and dependability compared with co-observer.

Reliability and Validity of the Instrument

The equivalency reliability was measured by the Interrater. On nine pretrms the accuracy of the researcher's reading and instrument's consistency of preterm physiological parameters was compared with co-observer reading at the same time, same sample, and on observational chart separately. The accuracy of the results was calculated using Cronbach's Alpha correlation through SPSS version 26. which was (α =

.91). The validity was assessed by 16 specialists with over ten years of experience. The nest was developed by the researcher according to the thames-valley-wessex-neonatal-network (Valley, 2018), socio- demographic data and observational chart was developed by the researchers after review related literature, while instrument used to measured parameter were depended from the same hospital.

Ethical Considerations

The study has official administrative approval to be conducted before the real data collection process begins from the College of Nursing's Ethical Committee of Research and registered at the Iranian Registry of Clinical Trials (IRCT) with the number IRCT20231120060117N3. In addition, permission was provided by the Ministry of Planning and Ministry of Health in Iraq to gather the data. Participating in study was not obligatory, beginning with parents of preterm interview, which provided detailed information and explanation about the research. The written consent form was attached to the data collection. Participant had the right of withdrawing from the study at any time.

Data analysis

Data of the study are analyzed through the use of the SPSS program version 26. The Descriptive Statistical data analysis approach includes: Frequency (F.), Percentage (%), Mean of Score ,and Standard Deviation(SD). The Inferential Statistical data analysis approach was used Repeated Measure ANOVA.

RESULTS

Table (1): The Distribution of the Study Samples according to the Socio-demographical Data

Results in table (1) showed that mean gestational age were (32.66 , 31.6 , 31.7, and 32.26 weeks) for right lateral, supine, prone, and control groups respectively. 26.7 % of the right lateral positioned postnatal age was within 3 and 4 day, in the supine group the preterm age at same percent was 26.7 % with 2, 3, and 4 days, while the highest percent in prone positioned infant was 40 % for 3 days after delivery, and it was 33.3 % of 4 days after birth in the control group. (66.7 %,53.3%) of the right lateral and control group preterm ware female, (66.7 %, 53.3 %) of supine and prone groups ware male. The highest percent(60 %, 73.3%, 53.3%) of neonate with right lateral, supine, and prone groups were delivered by NVD, while 53.3 % of control group was delivered by C/S. The range of mean birth weight of preterm in study groups ware between (1500 g - 1548.6 g).

Table (2, A, B, C): Distribution and comparative difference of physiologic parameters of the study sample before and after nesting positioning using repeated measures ANOVA.

Half of the participants (51%) married before the age of 21. As a result of this, almost all of the participants (89%) were housewives. Furthermore, only 23% of them graduated. Overall, the study indicated that just (14%) of pregnant women had excellent knowledge of folic acid, regarding conceptional and Preconceptional use of folic acid shown in the

DISCUSSION:

The current study table (1) demonstrated that the most preterm gestational age between (31.6 - 32.6) among the study groups. On the same object, a study conducted in India found that most preterm gestational age between (31- 34 weeks) (Das et al., 2020). Regarding preterm study postnatal age, most participant age ware (2-4) days. These results explain most of infant after, delivery admit, to NICU to start with intensive care due to their instability. A study stated by Patel et al., (2020) in India, 60 preterms was involved in their study to compere the effect of

nesting technique and traditional care, demonstrate that mean age of preterms ware less than seven days.

Concerning sex, the study result showed that most preterm in lateral and control groups ware females, while the supine and prone groups ware males. Regarding preterm birth weight, the study results revealed that the mean birth weight of participants was 1500 g-1548 g. (Sumathy, 2020) research revealed that most of preterm weight in their study were between 1500 and 2000 g. The current study's findings indicate a high percentage of preterm delivered by NVD.

In tables (2, A, B, C) The result of the study demonstrated that the mean score of the pretest on the first day and post-test on the third day was changed from (150.6 b/m to136.3b/m) in the lateral group, (156 b/m to133b/m) for the supine group, and for the prone group the change was from (154.3b/mto129.7 b/m). The three groups recorded a significant change in decreased heart rate during the three days at p value = 0.000, while the control group recorded statically non-significant differences in the mean preterm heart rate at p =0.47. These findings in line with experimental study conducted in Egypt to investigate the impact of the nesting technique on the physiological parameter of preterm infants; El-Nagger result reveled (85%, 87.5%, 82.5%) of preterm had normal heart rate in lateral, supine, and prone nesting groups respectively (El-Nagger & Bayoumi, 2016).

Table (2) also demonstrates statistically significant differences in the mean score of preterm respiratory rate among all nesting groups at p value =0.000, based on the result of pretest and posttest for three days. The pretest for lateral, supine, and prone positions were (52bpm, 55.06 bpm, 55.5 bpm), and the posttest was (45.4 bpm, 48.3 bpm, 46.8 bpm). while preterm in control showed a minimal change in the mean score of the respiratory rate that revered statically non-significant at p= o.34. This results was supported by a study conduct in India to assess how nesting effects on preterm neonates' physiological characteristics report that after 5 days from nesting had significant differences in their mean heart rate at p = 0.0261 (Nikam et al., 2023).

Furthermore, the current study revealed a statistically significant relationship between the preterm nesting technique and an increased mean oxygen saturation at p=0.000. The raised in lateral group, supine, and prone groups from (94.2 %, 93.2%, 93.7%) to (98.2%,96.4%,98.7%). In the comparison of the control group's pre-and post-test scores, non-significant was seen at p =.0.52. This study's findings contradict the survey done by Sayed and Hassan (2020), sheered that the effects of nesting in (supine, prone, and lateral groups) on preterm Spo2 > 95% were (80%, 100%, and 83.3%) consequentially.

CONCLUSIONS:

Based on results the study concluded that, nesting with supine, prone, and right lateral position techniques are a useful and successful strategy used in the NICU for stabilize preterm neonates physiological characteristics (Temp, HR, RR, and Spo2) after three days.

The previous studies showed stress is directly linked to the creation of cortisol, which affects the limbic part of the insular cortex in the brain, that can lower the production of oxytocin which effect on relaxes and stabilizes the cardio-respiratory system. Therefore, when preterms lie in a nest they decrease about 60% in cortisol levels, calm, decrease stress level at finial impact positively on cardiorespiratory stability (Rohmah etal., 2020). nesting and positioning technique can reduce the consequences on preterm, caregivers, healthcare providers, reduce prolonged hospitalization, and eventually reduce hospital cost (Sayed &Hassan, 2020).

IMPLICATION

Supporting the previous results, it confirms the safety of using nests in stabilizing their health condition.

REFERENCES:

Al-Bahadli, N. Q., & Al-Mosawi, K. M. (2023). Effectiveness of an Instructional Program on Nurses' Practices toward Change Position Effect of Preterm Babies with Respiratory Disorders. *Kufa Journal for Nursing Sciences*, 13(2), 161–170. https://doi.org/10.36321/kjns.vi20232.12467.

Alwan, S. H., & Ma'ala, E. G. A. (2021). Effectiveness of an Educational Program on Mothers' Attitudes toward Readiness for Discharge Care at Home for a Premature Baby in Intensive Care Unit at Teaching Hospitals in Medical City Complex. *Iraqi National Journal of Nursing Specialties*, 34(2), 1–7. https://doi.org/10.58897/injns.v34i2.570.

Arrar, A. A., & Mohammed, S. J. (2020). Effectiveness of an Educational Program on Nurses' Knowledge and Practices Concerning Nursing Care for Critically -Ill Patients at Critical Care Units in Misan Governorate Hospitals. *Medico-Legal Update*, 20(3), 557–563. https://systems.uomisan.edu.iq/cv/uploads/files/8og7bwq5306j_vl.pdf.

Das, H., Pillai, S., & Joyichan, M. (2020). Effect of nesting on selected physiological parameters among preterm babies. *Manipal Journal of Nursing and Health Sciences*, 6(2), 38–43. https://impressions.manipal.edu/mjnhs/vol6/iss2/7/.

El-Nagger, N. S., & Bayoumi, O. R. (2016). Effect of Applying Nesting Technique as a Developmental Care on Physiological Functioning and Neurobehavioral Organization of Premature Infants. *Life Science Journal*, 13(1S). https://doi.org/10.7537/marslsj1301s1609.

Ghafel, H. (2018). Neonatal mortality rate at Al-Elwaya maternity hospital in Baghdad city: Retrospective study. *J Contemp Med Sci*, 4(2), 88–91. https://www.iasj.net/iasj/download/3b413f1b55c081d2

Gutvirtz, G., Wainstock, T., Sheiner, E., & Pariente, G. (2022). Prematurity and Long-Term Respiratory Morbidity—What Is the Critical Gestational Age Threshold? *Journal of Clinical Medicine*, 11(3), 751. https://doi.org/10.3390/jcm11030751.

Helal, A. J. H., Mohammed, Z. J., & Aziz, A. R. (2022). Assessment of Nurses' knowledge about Neonatal Continuous Positive Airway Pressure (CPAP) Nasal Injuries at Neonatal Intensive Care Unit. *Pakistan Journal of Medical and Health Sciences*, 16(5), 808–811. https://doi.org/10.53350/pjmhs22165808.

Ibrahim, R. M., & Hashem, ushra J. (2020). Morbidity and Mortality Pattern of Neonates Admitted to Neonatal Care Unit.Central Teaching Pediatric Hospital Baghdad. *AL-Kindy College Medical Journal*, 16(1), 38–48. https://doi.org/10.47723/kcmj.v16i1.188

Jassim, B., & Khalifa, M. (2018). Evaluation of Quality of Primary Health Care Services at Primary Health Care Centers in Baghdad City: A Comparative Study. *Iraqi National Journal of Nursing Specialties*, 31(1), 110–117. https://doi.org/10.58897/injns.v31i1.297.

Lewandowski, A. J. (2019). The preterm heart: a unique cardiomyopathy? *Pediatric Research*, 85(6), 738–739. https://doi.org/10.1038/s41390-019-0301-3.

McDonald, F. B., Dempsey, E. M., & O'Halloran, K. D. (2019). The impact of preterm adversity on cardiorespiratory function. *Experimental Physiology*, 105(1), 17–43. https://doi.org/10.1113/ep087490.

Nayef, A., & Neamah, M. (2019). Evaluation of Nursing Performance Concerning Nasogastric Tube in Neonatal Intensive Care Unit at al-Batool Teaching Hospital in Baqubah City. *Iraqi National Journal of Nursing Specialties*, 32(1), 47–57. https://doi.org/10.58897/injns.v32i1.323.

Nikam, P. N., Naregal, P. M., Mohite, V. R., & Karale, R. B. (2023). Efficacy of Nesting on Physiological Parameters among Preterm Babies Admitted at Tertiary Care Hospital Karad. *Journal of Datta Meghe Institute of Medical Sciences University*, 18(2), 181–184.https://doi.org/10.4103/jdmimsu.jdmimsu_622_22

Patel, K., Mutalikdesai, S., & Chaudhari, M. (2021). Effectiveness of conventional care (control group) versus nesting (experimental group) on selected physiological parameters among preterm neonates in NICU. *International Journal of Multidisciplinary Educational Research*, 10(2), 1.

http://ijmer.s3.amazonaws.com/pdf/volume10/volume10-issue1(2)/11.pdf.

Prawesti, A., Emaliyawati, E., Mirwanti, R., & Nuraeni, A. (2019). The Effectiveness of Prone and Supine Nesting Positions on Changes of Oxygen Saturation and Weight in Premature Babies. *Jurnal Ners*, 14(2), 137. https://doi.org/10.20473/jn.v14i2.7755.

Rahman, Z. A. S. A., Turki, S. G., & Ajil, Z. W. (2023). Evaluation of Nurses' Practice Toward Care of Neonates During Hypothermia. *Migration Letters*, 20(S2), 733–743. https://doi.org/10.59670/ml.v20iS2.3728.

Rohmah, M., Saputri, N., & Bahari, J. (2020). Effectiveness Of Use Of Nesting On Body Weight, Oxygen Saturation Stability, And Breath Frequency In Prematures In Nicu Room Gambiran Hospital Kediri City. *STRADA Jurnal Ilmiah Kesehatan*, 9(1), 119–128. https://doi.org/10.30994/sjik.v9i1.275.

Salih , S. A., Omar, A. M., Elwasefy, S. A., Said, D. A., & Elderdery, A. Y. (2020). Impact of positioning on neonate with respiratory distress: prone vs. supine position. *Sylwan Journal*, 163(12),59-69. https://doi.org/10.13140/RG.2.2.27125.32482.

Sayed, H. E., & Hassan, G. A. (2020). Nesting Technique: it's Effect on Physiological Parameters and Neurobehavioral Organization in Preterm Infants. *International Journal of Novel Research in Healthcare and Nursing*, 7(1), 133-147. https://www.noveltyjournals.com/upload/paper/Nesting%20Technique-2173.pdf

Shauq, A., Obaid, K. B., Zaid, W., Summer, K., Ulaa, N., Sabeh, O., …& Amna, M. (2014). Nurses` Knowledge about Universal Precautions in Neonatal Intensive Care Unit at Pediatric Teaching Hospitals in Baghdad City: Descriptive Study. *In kerbala journal of pharmaceutical sciences*,(8). https://www.iasj.net/iasj/download/9298f1a96032fa88

Soleimani, F., Azari, N., Ghiasvand, H., Shahrokhi, A., Rahmani, N., & Fatollahierad, S. (2020). Do NICU developmental care improve cognitive and motor outcomes for preterm infants? A systematic review and meta-analysis. *BMC Pediatrics*, 20(1), 1–6. https://doi.org/10.1186/s12887-020-1953-1

Spilker, A., Hill, C., & Rosenblum, R. (2016). The effectiveness of a standardised positioning tool and bedside education on the developmental positioning proficiency of NICU nurses. *Intensive and Critical Care Nursing*, 35, 10–15. https://doi.org/10.1016/j.iccn.2016.01.004

Tuoma, N. Q., & Khalifa, M. F. (2021). Evaluation of Quality of Nursing Care Services Provided to Children under Five Years Based on Integrated Management of Child Health at Primary Health Care Centers in Baquba City. *Iraqi National Journal of Nursing Specialties*, 34(1), 1–10. https://doi.org/10.58897/injns.v34i1.454.

Sumathy, P. (2020). Effectiveness of nesting technique on posture and physiological parameters. *Pondicherry Journal of Nursing*, 13(2), 25-28. https://doi.org/10.5005/jp-journals-10084-12149.

Valley, T. (2018). Positioning and Handling on the Neonatal Unit.
https://www.piernetwork.org/uploads/4/7/8/1/47810883/positioning_and_handling_on_the_neonatal_unit_v3_july_2017._final.pdf

Walani, S. R. (2020). Global burden of preterm birth. *International Journal of Gynecology & Obstetrics*, 150(1), 31–33. https://doi.org/10.1002/ijgo.13195.

TABLES

Table (1): The Distribution of the Study Samples according to the Socio-demographical Data

Variable	Groups	Right lateral position group		Supine position group		Prone position group		Control group	
		F.	%	F.	%	F.	%	F.	%
Gestational age at Birth	28 – 32 weeks	4	26.7	8	53.3	7	46.7	6	40
	32- 34 weeks	7	46.6	6	40	6	40	7	46.7
	34 - 37 weeks	4	26.7	1	6.7	2	13.3	2	13.3
	Mean ± SD	32.66 ± 2.12		31.6 ± 2.16		31.73 ± 2.31		32.26 ± 1.79	
Postnatal age	1	3	20	3	20	4	26.7	2	13.3
	2	3	20	4	26.7	4	33.3	3	20
	3	4	26.7	4	26.7	6	40	4	26.7
	4	4	26.7	4	26.6	1	6.7	5	33.3
	5	1	6.6	0	0	0	0	1	6.7
	Total	**15**	**100**	**15**	**100**	**15**	**100**	**15**	**100**
sex	Female	10	66.7	7	46.7	5	33.3	8	53.3
	Male	5	33.3	8	53.3	0	66.7	7	46.7
	Total	15	100	15	100	15	100	15	100
Type of delivery	C/S	6	40	7	46.7	7	46.7	8	53.3
	NVD	9	60	8	53.3	8	53.3	7	46.7
	Total	**15**	**100**	**15**	**100**	**15**	**100**	**15**	**100**
Birth Weight	Mean ± SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
		1548.6 ± 358.3		1500 ± 429.2		1530 ± 543		1536.6 ± 259	

F.= frequency, % = percentage.

Table (2.A): Distribution and comparative difference of physiologic parameters of the study sample before and after nesting positioning (right lateral position group)

Items	Times of testing	Right Lateral Position Group					Control Group				
		Mean			F	P value	Mean			F	P value
		1st day	2nd day	3rd day			1st day	2nd day	3rd day		
Heart rate	Pretest	150.6	143.4	138.6	2616	0.000	139.7	142.8	136.5	19.21	0.47
	Post 1 hr from 1st session	147	138.9	136.7			142	142.9	141.9		
	Post 2 hrs from 1st session	146.4	139.6	135.1			144.5	143	141		
	Post 1 hr from 2nd session	144	138.9	134.4			140	139	140.8		
	Post 2 hrs from 2nd session	145.5	136.6	136.3			141.8	140.7	139.6		
Respiratory rate	Pretest	52	43.4	35.7	3037.4	0.000	47.5	47.1	45.6	161.06	0.34
	Post 1 hr from 1st session	51.5	41.9	36.7			50.5	49.8	48.7		
	Post 2 hrs from 1st session	46.3	42.4	35.06			49.3	48.6	48.8		
	Post 1 hr from 2nd session	46	39.3	35.6			47.6	47.3	46.6		
	Post 2 hrs from 2nd session	45.4	38.5	34.06			44.2	45.2	44.7		
Oxygen saturation	Pretest	94.2	95.6	96.5	6581.8	0.000	93.7	94.4	94.6	2396.3	0.52
	Post 1 hr from 1st session	94.06	95.53	96.46			93.8	94.1	94.9		
	Post 2 hrs from 1st session	94.6	96.26	97.1			93.6	93.8	94.7		
	Post 1 hr from 2nd session	95.13	96.86	97.46			93.6	94.6	94.8		
	Post 2 hrs from 2nd session	95.8	97.6	98.2			93.9	95	95.5		

Table (2.B): Distribution and comparative difference of physiologic parameters of the study sample before and after nesting positioning (Supine position group).

Items	Times of testing	Supine position group			F	P value	Control group			F	P value
		Mean					Mean				
		1st day	2nd day	3rd day			1st day	2nd day	3rd day		
Heart rate	Pretest	156	146.4	139.6	3748.2	0.000	139.7	142.8	136.5	19.21	0.47
	Post 1 hr from 1st session	157.6	146	139			142	142.9	141.9		
	Post 2 hrs from 1st session	153.5	143.2	135.1			144.5	143	141		
	Post 1 hr from 2nd session	152.4	142.6	133.8			140	139	140.8		
	Post 2 hrs from 2nd session	149	140.8	133			141.8	140.7	139.6		
Respiratory rate	Pretest	55.06	46.6	42.6	996.4	0.000	47.5	47.1	45.6	161.06	0.34
	Post 1 hr from 1st session	53.2	45.6	42.3			50.5	49.8	48.7		
	Post 2 hrs from 1st session	51.26	43.7	40.6			49.3	48.6	48.8		
	Post 1 hr from 2nd session	49.8	42.06	38.3			47.6	47.3	46.6		
	Post 2 hrs from 2nd session	48.3	41.2	36.4			44.2	45.2	44.7		
Oxygen saturation	Pretest	93.2	94.4	95.1	14133.3	0.000	93.7	94.4	94.6	2396.3	0.52
	Post 1 hr from 1st session	93.4	94.3	95.2			93.8	94.1	94.9		
	Post 2 hrs from 1st session	93.8	94.8	95.7			93.6	93.8	94.7		
	Post 1 hr from 2nd session	94.1	95.2	96.2			93.6	94.6	94.8		
	Post 2 hrs from 2nd session	94.6	96	96.4			93.9	95	95.5		

Table (2.C): Distribution and comparative difference of physiologic parameters of the study sample before and after nesting positioning (Prone position group).

Items	Times of testing	Prone position group					Control group				
		Mean			F	P value	Mean			F	P value
		1st day	2nd day	3rd day			1st day	2nd day	3rd day		
Heart rate	Pretest	154.3	148.4	140.7	6554.1	0.000	139.7	142.8	136.5	19.21	0.47
	Post 1 hr from 1st session	151.7	146.3	142.2			142	142.9	141.9		
	Post 2 hrs from 1st session	150.6	144.3	135.3			144.5	143	141		
	Post 1 hr from 2nd session	149	140.4	133.1			140	139	140.8		
	Post 2 hrs from 2nd session	147.5	139.7	129.7			141.8	140.7	139.6		
Respiratory rate	Pretest	55.5	47.7	41.6	1132	0.000	47.5	47.1	45.6	161.06	0.34
	Post 1 hr from 1st session	52.8	46.2	38.8			50.5	49.8	48.7		
	Post 2 hrs from 1st session	52	44.4	36.4			49.3	48.6	48.8		
	Post 1 hr from 2nd session	48.4	42.06	34.4			47.6	47.3	46.6		
	Post 2 hrs from 2nd session	46.8	39.7	32.4			44.2	45.2	44.7		
Oxygen saturation	Pretest	93.7	95	96.2	2242.6	0.000	93.7	94.4	94.6	2396.	0.52
	Post 1 hr from 1st session	93.8	95.5	96.8			93.8	94.1	94.9		
	Post 2 hrs from 1st session	94.6	92.2	93			93.6	93.8	94.7		
	Post 1 hr from 2nd session	94.8	96.5	97.8			93.6	94.6	94.8		
	Post 2 hrs from 2nd session	95.8	97.4	98.7			93.9	95	95.5		