IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 8, Issue 3 Ser. III. (May. - June .2019), PP 42-49
www.iosrjournals.org

Breast Milk Odor Effecton Weight Gain, First Breastfeeding Time and Length ofHospital Stay in Premature Infants

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Abstract
Background*; Mother's milk odor stimulates sucking that is necessary to start oral feeding and improve this inherent and rhythmic behavior so the transitional period from gavage to oral feeding.* ***Aim****; the aim of this study was to assess the effect of breast milk odor on weight gain, first breastfeeding time and length of hospital stay in premature infants.* ***Design****; the study utilized quasi-experimental research design. Sample; a total of 92 premature infants were included in study (46 as study group and46 as control group).* ***Methods****; the study was conducted at neonatal intensive care unit of University Children's Hospital in Assuit, Egypt. Demographic profiles were extracted from the infants' medical records. A checklist of recorded data from the same study was made available.* ***Results****; The findings of the study indicated that the mother's breast sucking was more effective and initiated over a shorter time in the study group compared to the control group. Olfactory stimulation of breast milk odor strengthening feeding competence of infants and reduced the duration of time for the first breast feeding.* ***Conclusions****; the preterm infants who were motivated by the odor of breast milk have decreased the first breastfeeding duration, rise weight gains and reduced in length of hospital stay.* ***Recommendation****; Pediatric nurses musteducate mothers to pump their breast milk, stimulate their infants with the odor of their breast milk, and feed it to their infants in the premature unit. This may lead to a quicker starting to oral feeding and decrease hospital staying.*

Keywords*: Breast Milk odor, Weight Gain, First Breastfeeding Time, Hospital Stay, Premature Infant.*

Date of Submission: 08-05-2019 Date of acceptance: 23-05-2019

I. Introduction

One of the major challenges in premature infants is the difficulty in establishing sucking-feeding competence. A preterm neonate is an infant born less than 37 weeks of gestation. Due to the prematurity of the birth, these infants have numerous problems that result in many hospitalizations**(Feldman &Eidelman, 2011).**

In developed countries preterm births are a severe public health problem, with the occurrence increasing over the past 10 years such that 7.5% of newborns are low birth weight and one of nine infants is premature in the United States**(Smith et al., 2014).**

In Egypt, the infant mortality rate according to the Ministry of Health and Population (MHP) was 18.3 in 2012 which declined to 15.63 in 2016. Despite efforts and a 50% decrease in infant mortality in Egypt, there has been little successin reducing the neonatal mortality rate. In spite of the improvement in survival rate of preterm infants attributed to technological progresses, physically these infants are immature and vulnerable to long term health problems especially at Upper Egypt **(MHP, 2017).**

The long use of tube feedings leads to complications such as vagus nerve stimulation, lack of correct placement that may break the passage route, deprivation of emotional mother bonding and pain, destruction of the sense of trust and impairment of their communication with the surrounding environment**(Dawson et al., 2015).**

Effective feeding capability leads to a stable physiological status, desirable weight gain and faster hospital discharge, reduction of hospital infection risk, a reinforcement of the emotional parent-infant bond and decrease in cost both for thehealth systemandtheprematureinfant'sfamily**(Engen et al., 2014).**

The sense of smell is one of the most developed human senses that creates an emotional bond and causes infants to show effective behavioral responses such as head turning, alertness, and mouth waggling to reach their mother's breast**(Shamsi et al., 2014).**

Premature infants are able to distinguish their mothers' breast milk odor and recognize it among other unfamiliar odors. Mother's milk odorstimulatessucking that is necessary to start oral feeding and improve this inherent and rhythmic behavior by activating the trigeminal and facial motor nerves located in the brain stem so the transitional period from gavagetooralfeeding**(Feldman &Eidelman, 2011).**

The duration of feeding is one of behavioral symptomsassessed for evaluation of effective feeding quality. The length of breast feeding for greater than 30 minutes shows a problem in the newborn's feeding

capability, therefore doctors ask mothers about sucking quality and feeding duration after feeding the premature infant. Accordingly, theydeterminethetimeofdischargefromthehospital**(Soussignan et al., 2016).**

Weight gain is another marker of high-quality premature infant feeding and desirable weight gain is a significant key for discharge. Oral feeding in infants should be effective to reservationdrive for growth. Although more can be done to progress the nutritional status and growth of LBW infants during their first hospitalization, it is obvious that adjustment of developed nutrient insufficiencies is difficult toachieve before discharge**(Younes, 2015).**

There are several interventions such as odor stimulation that facilitates sucking behavior which are of value for strengthening the infant's oral-motor skills for the prematureinfant togain sufficientcontrol toprogresswithoral feeding. Mechano-sensory stimulation delivered to the baby's oral sense hastens non-nutritive suck development and oral feeding success in preterm infants at risk for oromotor dysfunction**(Lessen, 2011).**

Doucet et al., (2010) research indicated that during each breast feeding, babies in the milk-odor group exhibited lengthier sucking sessions and more spurts collected of 7 sucking movements. These infants expended more milk than the control infants.

A review of the literature has shown a number of studies that assess the effect of breast milk smell on behavioral features of premature infants. Assessments included breast feeding intake, time and weight gain. The study by **Mohamed (2016)** assessed the effects of exposure to the odor of mother's milk on breast feeding behavior in 13 preterm infants born at 30-36 weeks gestational age (GA). Of these, 7 were randomly given to the milk-odor group and 6 to the water-control group.

According to **Hazem (2012),** that mother's breast feed their offspring for two complete years. It is also mentioned that every newborn infant has the right to be breastfed. These researchers have stated that Egyptian media which include television programs in addition to newspaper and popular magazine articles frequently discuss the benefits of breast feeding and the adverse effects of formulas and other breast milk substitutes.

Breast feeding readiness is based on dataaccomplished from nurses about the time and the amount of feeding. This information is evaluated and recorded as discharge criteria in the nursing report. Initial breast feeding is considered as the basis of an infant's capability and is considered as an assessment of premature infant feeding competency.This assessment is performed under the nurses' direct control and training**(Mustafa, 2014).**

Providing accurate and timely education to the parents about effective methods and strategies that decrease the duration of the first breast feeding improves the value of care providing for infants in Neonatal Intensive Care Unit (NICU). According to precious studies, one of these methods or approaches is breast milk odor**(Younes, 2015).**

Lessen studied the effect of premature infant Human Milk Smell (HMS) intervention on feeding progress and length of stay in preterm infants. The results presented that premature infanthuman milk smell was well tolerated by 29-week age infants, as showed by physiological and behavioral signals. Infants who established once-daily (HMS) transitioned from their first oral feeding to total oral feedings 5 days faster than controls. They were discharged 2.6 days faster than those in the control group**(Shamsi et al., 2014).**

Newborns' attraction to the odor of breast milk is one of the fundamental behavioral responses that human newborns share with other mammalian species.Their ability to distinguish the odor of their mother's breast milk from that of other mothers reflects human newborns' exquisite olfactory sensitivity. In addition to mediating social recognition, maternally derived odors organize and stimulate newborns' feeding behavior. This attraction has most often been measured as a tendency to turn the head toward the odor source,a response that orients the newborn's mouth toward its food **(Zhou, 2016).**

II. Significant of the study

Studies of newborns' behavioral responses certainly to breast milk odors and often made note of improve mouthing movements, sucking behavior or time of beginning breast feeding**(Feldman &Eidelman, 2011).**

The odor of breast milk positively affected infants' transition time from gavage to oral feeding and their hospital stay. At Egypt some studies have formally addressed whether or how this human milk odors stimuli may regulate this adaptive ingestive behavior**(MHP, 2017).**

III. Aim of the study

The aim of the present study was to assessthe effect of breast milk odor on premature infant's first breastfeeding time, weight gain and their hospital stay in premature infants.

- **Operational definition of first breastfeeding time**: is the period when that a child was fed breast-milk for the first time**(Porter et al., 2016).**

- **Operational definition for premature infants:**World Health Organization (WHO) definition of prematurity is a baby born before 37 weeks of gestation, counting from the first day of the Last Menstrual Period (the LMP)**(WHO, 2015).**

Research hypothesis

Premature infants who will receive breast milk odor will have less first breastfeeding time, increase weight gain and less hospital stay period than those who will not receive breast milk odor and have routine hospital care.

Design:

The present study utilized quasi-experimental research design. In this experimental research with convenience sampling, a random assignment was performed using a simple randomization method.

IV. Methods

Sample and sampling method:

Preterm infants were selected from the Neonatal Intensive Care Unit (NICU) at University Children's Hospital in Assiut, Egypt. This referral treatment hospital is a governmental university hospital, containing a 40-bed NICU and numerous wards divided to intensive care, middle care, septic room and out-patient clinic.

The study sampleinvolved premature infants admitted to the NICU who met the criteria to participate in the study. All infants were randomized into the control or intervention groups by using a stratified blocked randomization method with a block size of 4. Stratified the infants according to GA of 28-32 weeks versus 32-36 weeks to confirm that the two groups had a similar GA distribution.

The sample contained 92premature infantsdistributedinto twogroups: 46 infantsin the control group and 46 infantsin the intervention group. Power analysis was showed and discovered a power of 0.99 for 46 infants in each group at a 0.5 significance interval to range an adequate sample size. The 46 premature infants in the control group received no intervention except for routine care while the 46 infants in the interventiongroup received olfactory stimuli. There were 8 infants in the intervention group and 9 infants in the control group who were excluded due to respiratory problems and feeding intolerance. Replaced the excluded infants.

Inclusion criteria:

Infants with GA of 28-36 weeks, infants who had powerlessness and weakness in sucking reflex according to physician diagnosis birth weight of 1 kg, Apgar score of more than 6 at minutes 1 and 5, infants who had appropriate cardio-respiratory condition with no drop in O_2 saturation, occurrence of no congenital disease, no intracranial hemorrhage or pathological jaundice and infants who showed a good tolerance by initial gavage feeding.

Exclusion criteria includedabsence of the above conditions in addition to: craniofacial anomalies, respiratory distress syndrome, lung disorders and sepsis or meningitis.

Ethical consideration:

Research proposal was approved from Ethical Committee in the Faculty of Nursing and here is no risk for study subject during application of the research. The study followed common ethical principles in clinical research. Written consent was obtained from the parents of premature infants before participated in the study and after explaining the nature and purpose the study.Confidentiality and anonymity was assured and infants'parents have the right to refuse to participate and or withdraw from the study without any rational any time.

Data collection tools

The instrument in this study was a checklist planned by **Yildiz et al., (2011).**Part one; included demographic data about the premature were taken out from their medical recordssuch as mother's age, infant's name, age, gestational age and sex. Part two; this was designed to collect information about medical/surgical diseases, type of delivery, type of feeding, First infant breast feeding time by seconds, number of feeding, amount of milk per feed, time of feeding shifting from gavage to breast milk feeding, during/after feeding problems, infant's birth weight by grams, entrance weight by grams, weight gain by grams, Apgar scores at minutes 1 and 5, date of admission and date of discharge.

The data collected included demographic information such as mother's age and sex of the infant, GA at birth, infant's weight at birth, and Apgar scores at minutes 1 and 5.

Collected data from the time of study admission until the beginning of oral feeding and discharge. Measurement tools used in thisstudy involved a digitalscale, milkglasstocollectbreastmilk,anda watch.

The validity was done for tool by five experts in the pediatric field and its result was 96%. And reliability was estimated by Alpha Cronbach's test for the tool and its result was R=0.66.

Pilot study

A pilot study was carried out before starting the data collection it will be done on ten infants to test the identify feasibility and applicability of the tools used and they was excluded from the study sample.

Procedure

Step 1

Showed daily visit to the NICU of selected hospital in order to obtain agreement from parents of participating appropriate infants. Then, infants were located in either the intervention or controlgroupsthrough theavailable sampling method to obtain the correct number of participants. Then, revised the infants' medical records to complete the checklist for recording data.

Step 2

Mother's milk was collected for gavage feeding and saved in a refrigerator for 24 hours at a temperature of 2-8°C. After 24 hours from collecting the milk, fresh milk was collected again.

Step 3

Weighed the infants in both groups on a daily basis from the time of study record before gavage at 9 am until the beginning of the infant's first oral feeding. Weights were taken by the use of a digital scale.

Step 4

Control and intervention group infants were gavage fed by the gravity method. Infants were gavaged four times daily (9 am, 12 noon, 3 pm and 6 pm) - every three hours from the morning period until evening. The researcher implemented the gavage under the supervision of a related nurse. This process continuous until the start of oral breast feeding.

The intervention group established olfactory stimulation by the mother's milk pad for twenty minutes as below: a 1 cc volume of breast milk was emptied on the cotton sited within 1.5-2cm of the infant's nasal septum which was removed after the gavage. This stimulation was continuous until the infant's first breast feeding. The cottons were checked in order to not have any odor so that there was no problem with olfactory stimulation.

Step 5

The duration of the first breast feeding was documented by the researcher after preparation for breast feeding. The infant was directed to the mother's breast by observation and after documentation of the first effort to suck at the mother's breast. The time was recorded by a chronometer and ended with accomplishment of breast feeding. This act was doneand the duration of hospital stay was collected for all infants in both the intervention and control groups.

Statistical analysis

Statistical analysis was done through SPSS software version 16. Analyzed the data by several tests that involved: descriptive statistics, chi-square, mean value, standard deviations, the independent t-test and multiple linear regression.

V. Results

Analysis of demographic variables showed no difference between the two groups in their demographic variables. However entrance weight of premature infants in the two groups were significantly different as shown in Table 1.

The intervention group had a shorter time of first oral feeding compared to the control group. There was no significant difference detected in weight between the two groups.In addition, the duration of hospitalization in the intervention group was 12 days less than that in the control group shown in Table 2.

Table 1. Base line characteristics of preterm infants of the two groups

Z	X_2	P value	T value	Study group (n=46)		Control group (n=46)		Variables
				SD	Mean or %	SD	Mean or %	
		.193	-1.310	1.32388	30.7391	1.21980	30.3913	Gestational age at birth (weeks)
		.079	-1.777	412.76638	1601.9565	295.29198	1469.0217	Birth weight (gr)
		.612	-.510	168.15997	313.7826	158.62487	296.4130	Entrance weight (gr)
	.391	.532			46.7% 46.8%		53.3% 46.8%	Gender distribution Male Female
-.016		.987		1.20145	7.6087	.91049	7.5652	Apgar score(1 min)
-.130		.897		1.1129	8.6957	.99855	8.7391	Apgar score (5 min)

Table 2. Comparison of study and control group regarding: weight gaining,time of first breast feeding, time for transition to oral feedingand hospitalization time

X_2 or Z	P value	T value	Study group (n=46)		Control group (n=46)		Variables
			SD	Mean	SD	Mean	
	.612	-.510	168.15997	313.7826	158.62487	296.4130	Weight gain (gr)
Z: -4.586	.000		944.29942	824.7609	171.75533	865.8043	First infant breast feeding time (second)
	.000	10.374	3.23806	11.2174	6.00451	21.6522	Time for transition to oral feeding (days)
	.000	10.708	3.57555	14.5652	6.50355	26.2826	Hospital stay (days)

Figure (1) comparison of first breast feeding time in study & control groups

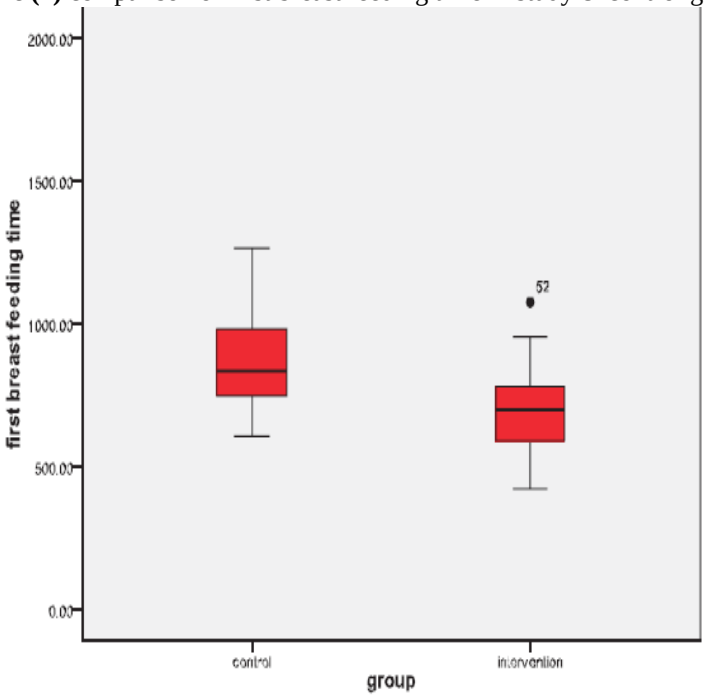
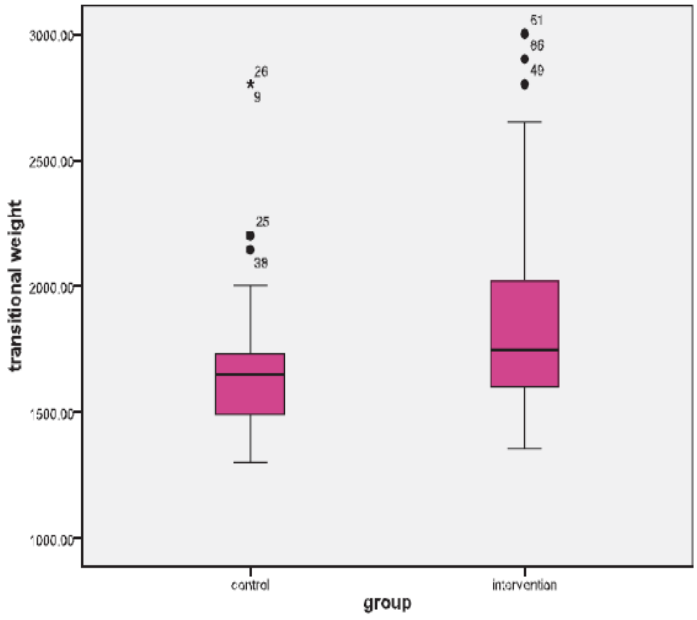
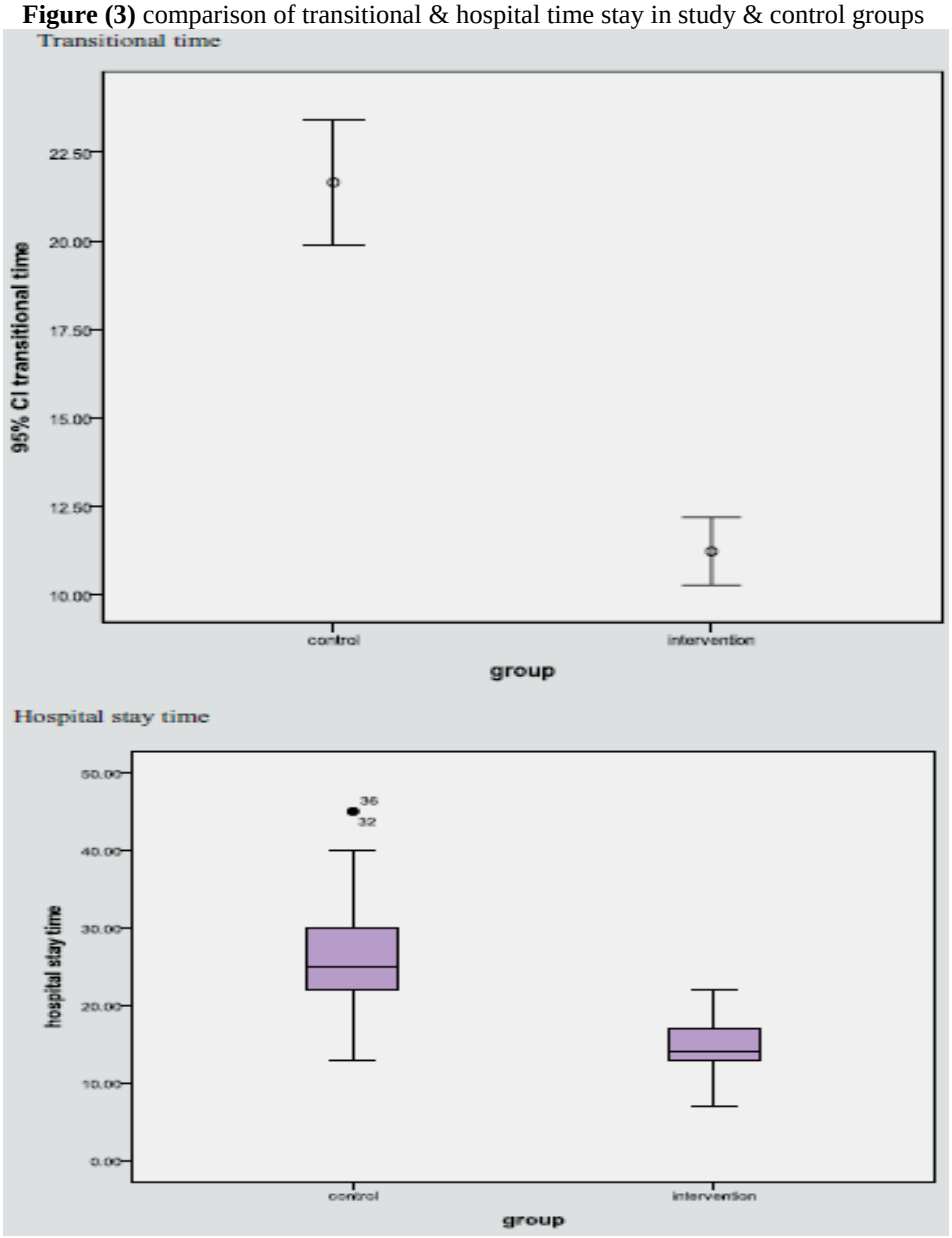


Figure (2) comparison of weight gaining in study & control groups



This figures 1 & 2 shows that the process of weight gaining in the intervention group compared to the control group.

Figure (3) comparison of transitional & hospital time stay in study & control groups



This figures 3 shows that the transition time from gavage feeding to oral feeding was 10 days shorter in the intervention group compared with the control group.

VI. Discussion

The first aim of this study was to compare the infants' weight gain in the intervention and control groups. Compared weight gain from study entry until the onset of breast feeding in both groups (p= 0.612). Many linear regression analysis presented that the difference in weight at admission did not affect weight gain in the oral feeding time. Therefore, odor stimulation did not affect weight gain**(Younes, 2015).**

McCain and his colleagues,(2010) investigated the effect of nonnutritive sucking ten minutes before gavage at regular intervals of every three hours on weight gain. The results showed that weight measurement in the control and intervention groups were not significantly different; both groups had an average weight increase of 15-20g/day.

Bingham et al., (2014) studied the effect of breast milk odor through an olfactometer for 7 tube-fed, premature infants in England. They experienced the effect of breast milk odor on non-nutritive sucking. In this study, 6 out of 7 neonates reacted to breast milk odor with an improved number of sucks. They found that breast milk odor strengthened non-nutritive sucking, feeding performance and weight gain.

Yildiz et al., (2011) measured the effect of mother's milk odour on transitional feeding in 80 premature infants andestablish no significant difference in weight gain between the two groups.

Studies by **Mustafa (2014)**reported a desirable level of weight gain in both groups in Upper Egypt study. The average weight gain in the Youssef study was 33.3 g/day in the breast milk smell group and 27.6 g/day in the control group. Figure 2 shows the process of weight gaining.

According to above results, it can be concluded that the optimum weight varies according to different nurses and physicians' points of view. Infants are discharged according to medical policies at their hospitals. Moreover, the long-term medical treatment process for infants to achieve a good physiological status is a natural process conducive to proper weight gain. Therefore, conducting interventions such as human milk smellstimulationdoes notsignificantly impactweight**(Niknajad&Akram, 2012).**

The second aim of the present study was to relate the first breastfeeding time in the two groups ($p<0.001$). The results exhibited that this variable was significantly different between the two groups. The average feeding time was 824.7609 seconds in the intervention group compared to 865.8043 seconds in the control group**(McCain et al., 2010).**

In similar resources, the first breast feeding was not measured as a base; rather the time of feeding at different times was studied. **Hill & Alice (2009)**compared three groups: nonnutritive sucking group by pacifier before breast feeding, supportive maneuver group on chin and cheek through feeding for one week and a control group with no intervention. The results exhibited that infants in the two intervention groups had shorter feeding periods compared to the control group.

Another study conducted by **White-Traut et al., (2012)** in the U.S. showed inconsistent results. They evaluated the influence of auditory, tactile, visual, and vestibular stimulation on behavioral feeding condition of infants. The results showed that the feeding time in the intervention group was more than the control group. They decided that the use of oral-motor stimulations directed to save energy in the infant and reduced fatigue during feeding, which lead to an improved feeding time.

Raimbaultet al., (2016)assess feeding time at two points: the latter day of olfactory stimulation and discharge time. The results presented no statistical difference between the control and intervention groups. These results could be related to the different capabilities of human beings. Sometimes they can be fed with less energy over a shorter time or over a longer time due to proper calorie supply. On the other hand, stimulation in the shorter time can influence the findings.

The third aim of this study was to compare the duration of hospital stay in the intervention and control groups. Based on the results, the average time of hospitalization among infants in the intervention group was 12 days less than the control group, which supported the results of a study by **Yildiz et al., (2011).** In their study, the length of hospitalization in the intervention group (18.30 ± 5.44 days) was 4 days less than the control group (22.85 ± 9.085 days).

Lessen (2011)investigated the effect of using a pacifier, lullabies, and no intervention on transition time from gavage to oral feeding in 3 groups. In their study, the duration of hospitalization of the 2 intervention groups (pacifier and lullaby) was less than that the control group.

White-Traut et al., (2012)sought to determine whether transition time could be shortened by early introduction of oral feeding in preterm infants. Their results indicated that infants in the intervention group achieved oral feeding 48 hours earlier than the control group; hospitalization in the intervention group was 10 days less.

However, infants are ready to be discharged both when they have a shorter transition time and achieve the ability for oral feeding. Totally, it can be said that there is a relationship between transition time and duration of hospitalization. These 2 variables mutually influence one another. As a result, they consequently affect the process of infants' weight gain and their physiological well-being **(Engen et al., 2014).**

Limitations of the study

This study was specifically conducted on premature babies who received treatment in the intensive care unit who met the inclusion criteria. Attempts were made to control factors that could affect weight gain and first breastfeeding time by honing the inclusion criteria. When unexpected conditions emerged during the study, (clinical conditions or those induced by the mother, infant, or research conditions) those infantswereexcluded from the study.

VII. Conclusion

Preterm infants exposed to breast milk odor during gavage feeding have been shown to establish oral feeding faster, more gain weight and subsequently accelerate their discharge from the hospital earlier than control group infants.

VIII. Recommendation

Nurses can train mothers to pump their breast milk so that it can be used for presentation as an odor stimulus to their infants in order to assist them to have a faster oral feeding.

Acknowledgments

Express our sincere appreciation to the nursing staff of the NICU of University Children's Hospital in Assiut, Egyptand the esteemedpediatricians and the parents of the infants.

References

[1]. **Bingham N., Peter M., David C and Taka A. (2014):** "Breast milk odour via olfactometer for tube-fed, premature infants." Behavior research methods, Vol.39, No.3, pp.630-634.
[2]. **Dawson M., Jennifer A., Ravinder S. and Nadia B. (2015):** "Push versus gravity for intermittent bolus gavage tube feeding of premature and low birth weight infants." The Cochrane Library.
[3]. **Doucet, S., Soussignan, R., Sagot, P., &Schaal, B. (2010):** "The "smellscape" of mother's breast: effects of odour masking and selective unmasking on neonatal arousal, oral, and visual responses." Developmental psychobiology, Vol.49, No.2, pp.129-138.
[4]. **Engen T, Lipsitt LP, Kaye H (2014):** Olfactory Responses and Adaptation in the Human Neonate. Journal of Comparative and Physiological Psychology. 56(1):73.
[5]. **Feldman R, Eidelman A. (2011):** Direct and Indirect Effects of Breast Milk on the Neurobehavioral and Cognitive Development of Premature Infants. Developmental Psychobiology.43(2):109-19.
[6]. **Hazem F (2012):** "Creating a breastfeeding culture: A comparison of breast feeding practices in Saudi Arabia and Egypt." Breast feeding Review, Vol.15, No.2, pp.15-20.
[7]. **Hill N, & Alice S. (2009):** "The effects of nonnutritive sucking and oral support on the feeding efficiency of preterm infants." Newborn and Infant Nursing Reviews, Vol.5, No.3, pp.133-141.
[8]. **Lessen B (2011):** Effect of the premature infant oral motor intervention on feeding progression and length of stay in preterm infants. Adv Neonatal Care. 11(2):129–39.
[9]. **McCain, G., Gartside, P., Greenberg, J & Lott, J (2010):** "A feeding protocol for healthy preterm infants that shortens time to oral feeding." The Journal of pediatrics, Vol.139, No.3, pp.374-379.
[10]. **Ministry of Health and Population (MHP) (2017):** "The reported causes for neonatal death in hospitals of Upper Egypt province in 2016." Egeptian Journal of Nursing and Midwifery Research, Vol.13, No.2.
[11]. **Mohamed A. (2016):** The calming effect of maternal breast milk odor on premature infants. PediatrNeonatol. 54(5):322–5.
[12]. **Mustafa M (2014):** "Importance and Availability of Nursing Support for Mothers in NICU: A Comparison of Opinions of Egyptian Mothers and Nurses." Egyptian Journal of pediatrics, Vol.22, No.2, pp.191.
[13]. **Niknajad K &Akram L. (2012):** "Factors affecting the neonatal intensive care unit stay duration in very low birth weight premature infants." J Caring Sci, Vol.1, pp.85-92.
[14]. **Porter R, Makin J, Davis L (2016):** Breast-fed infants respond to olfactory cues from their own mother and unfamiliar lactating females. Infant Behav Develop. 5(1):85–93.
[15]. **Raimbault C, Elie S and Richard H. (2016):** "The effect of the odour of mother's milk on breastfeeding behaviour of premature neonates." ActaPaediatrica, Vol.96, No.3, pp.368-371.
[16]. **Shamsi a, Movahed Z, Pouraboli B, Iranmanesh S. (2014):** The effect of olfactory stimulation with breast milk smell on the duration of feeding transitional time from gavage to oral feeding and hospital stay in premature infants hospitalized in neonatal intensive-care unit. Med-SurgNurs J. 3(1):23–17.
[17]. **Smith, L. K., Draper, E. S., Manktelow, B. N., Dorling, J. S., & Field, D. J. (2014):** "Socioeconomic inequalities in very preterm birth rates." Archives of Disease in Childhood-Fetal and Neonatal Edition, Vol.92, No.1, pp.11-14.
[18]. **Soussignan R, Schaal B, Marlier L, Jiang T. (2016):** Facial and Autonomic Responses to Biological and Artificial Olfactory Stimuli in Human Neonates: Re-examining Early Hedonic Discrimination of Odors. Physiology & Behavior. 62(4):745-58.
[19]. **White-Traut, R. C., Nelson, M. N., Silvestri, J. M., Vasan, U., Patel, M., & Cardenas, L. (2012):** "Feeding readiness behaviors and feeding efficiency in response to ATVV intervention." Newborn and Infant Nursing Reviews, Vol.2, No.3, pp.166-173.
[20]. **World Health Organization (WHO) (2015):** Early and Late Outcome of Premature Newborns with History of Neonatal Intensive Care Units J Child Neural. 10(2)
[21]. **Yildiz, A., Arikan, D., Gözüm, S., Taştekın, A., &Budancamanak, İ. (2011):** The effect of the odour of breast milk on the time needed for transition from gavage to total oral feeding in preterm infants. Journal of Nursing Scholarship, Vol.43, No.3, pp.265-273.
[22]. **Younes F (2015):** Impact of Oral Sensory Motor Stimulation on Feeding Performance, Length of Hospital Stay, and Weight Gain of Preterm Infants in NICU. Ira Red Crescent Med J. 17(7).
[23]. **Zhou W. (2016):** Human Olfactory Perception and Olfactory Communications of Social Information: Galen Medical Journal.2(4):157.

Faransa Ali Ahmed. " Breast Milk Odor Effecton Weight Gain, First Breastfeeding Time and Length ofHospital Stay in Premature Infants" .IOSR Journal of Nursing and Health Science (IOSR-JNHS), vol. 8, no.03 , 2019, pp. 42-49.