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EFFECTS OF OIL MASSAGE THERAPY ON ANTHROPOMETRIC PARAMETERS AND BEHAVIORAL STATE OF STABLE LOW BIRTH WEIGHT NEONATES

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ABSTRACT

Admission of low birth weight (LBW) neonates in neonatal intensive care unit (NICU) causes their deprivation of tactile and sensory stimulation. The exciting benefits of Oil massage therapy (OMT) encourage the researcher to conduct it as an essential and integrated part of the daily nursing care for the medically stable neonates therefore, the study aimed to investigate the effect of oil massage therapy on anthropometric parameters and behavioral state of stable LBW neonates. Oil massage therapy (OMT) is a natural way for the caregivers to improve neonatal health, anthropometric parameters, and sleep patterns. A quasi- experimental design was selected for this study, a purposive sample composed of sixty LBW neonates their weight less than 2500 grams selected from the NICU of El Manial University Hospital - Cairo University- Egypt. LBW neonates in the control group received routine nursing care, while LBW neonates in the intervention group received OMT for one session, 15 minute per day for 10 consecutive days, in addition to routine care. Anthropometric parameters, behavioral state, and hospital stay were compared between the two groups. The intervention group gained significantly more total mean weight gain (254.70± 29.16g) compared with the control group (110.20± 50.98g) after the study period. Neonatal OMT might be used as an effective, natural, and safe non-medical intervention for increasing anthropometric parameters and improving behavioral state of LBW neonates.

KEYWORDS: Anthropometric Parameters, Behavioural State, Low birth weight neonates, Low birth weight neonates, Oil Massage Therapy, Sunflower Oil

INTRODUCTION

The period of intrauterine growth and development is one of the most vulnerable periods in the human life cycle. (Teklehaimanot, Hailu, & Assefa; 2014) The sensation experienced in the intrauterine environment is ideal for normal growth and neurobehavioral development of the newborn. Newborn infants require efficient and cost effective care to compensate for possible shortage of intrauterine development. (Vickers, Ohlsson, Lacy, & Horsley: 2009).

Low birth weight is a major health problem and a significant contributor to neonatal death in both industrialized and developing countries (Deshpande Jayant, Phalke, Bangal, Peeyuusha, Bhatt Sushen; 2011). LBW has been defined by the World Health Organization as a BW of a live born neonate whose birth weight is less than 2500 g regardless of

gestational age. Tripathy (2014) reported that The global prevalence of LBW is 17%, which means about 25 million infants worldwide, the WHO/UNICEF (2014) stated that 96.5% of them in developing countries. Mohammed (2014) reported that an infant born with a LBW begins life immediately at a disadvantage and faces extremely poor survival rates. Approximately, every ten seconds an infant born in developing countries dies from diseases or infections that can be attributed to low birth weight

Low birth weight neonates are vulnerable to a numbers of problems and need special nursing care (Siddarth Ramji, Manoj Modi, and Neeraj Gupta; 2013). They may be admitted in NICU and the NICU presents LBW neonates with a challenging environment–filled with noisy and mysterious equipments, bright lights, unpleasant and painful stimuli with policy of minimal touch to avoid acquired infection which causes that neonates are deprived of tactile and sensory stimulation that is important in their growth outcome (Aly & Murtaza 2013; Karbasi, , Fallah, Golshan, Dehghan; 2014).

Ndu, Ibeziako, Obidike, Adimora, Edelu, (2014) mentioned that, Reducing LBW incidence is one of the major goals in 'world fit for children', WHO estimates that almost half of newborn mortality is associated with preterm or LBW neonates. To improve the care of LBW especially in resource-poor countries, alternative measurements have been studied. Also, El- Nagger, Abed El-Azim, and Hassan (2013) reported that the neonatal morbidity pattern presents serious pictures in Egypt. LBW neonates contribute as significant factor for raising the problems. The nurse must be more responsible in caring for the neonates. They must provide an environment which is safe and infection free adapted to their physiological needs and promotes nursing services to enhance their rate of survival and should demonstrate a new skilled nursing care for these neonates for early recovery and reducing the mortality rate and morbidity pattern.

Nurses working in NICU should search for new ways to improve the growth and developmental quality of LBW neonates. LBW neonates must receive best biomedical care, as well as proper, psychological, and emotional support to enhance their growth. (MohamedZadeh, Karbandi, Habibollah, and Mahdi ; 2009). Kaur (2013) & Batra & Mamta (2014), reported, staff nurses being the fore-runner of care providers play a vital role in the practice and implementation of oil massage therapy, so they have a great opportunity, to utilize techniques/protocols that could improve the growth and developmental quality of LBW neonates.

Massage therapy (MT) is one the evidence-based nursing performances for increasing weight for the premature and LBW neonates. (Fallah, Akhavan Karbasi, Golestan, & Fromandi, 2013) The MT technique is a gentle, structured, comforting touch, relaxation method aimed at limiting stress and anxiety in fragile intensive care neonates. It considered central in nursing knowledge and practice (Smith, 2013; Smith, Raney, Conner, Coffelt, McGrath, Brotto, & Inder 2012). Recently, a novel alternative to provide infant OMT to hospitalized LBW neonates at NICU is considered (Khan, Malik, Avtar, khurana, Bharadwaj, & singh 2015; Batra & Mamta, 2014.So, the study aimed to investigate the effect of oil massage therapy on anthropometric parameters and behavioral state of stable LBW neonates.

AIM OF THE STUDY

This study aimed to investigate the effect of oil massage therapy on anthropometric parameters and behavioral state of stable Low Birth Weight neonates.

HYPOTHESIS

- There will be a significant gain in anthropometric parameters (weight, length, and head circumferences) of low

birth weight neonates among those who receive oil massage in the intervention group than those who don't. in the control group.

- There will be a significant improvement in behavioral state of low birth weight neonates among those who receive oil massage in the intervention group than those who do not receive in the control group.

METHODS

This study is a quasi-experimental study. It was conducted at NICU of El Manial Paediatric Hospital - Cairo University. A purposive sample of 60 stable LBW neonates was assigned for the study. The field work was carried out by the researcher. The OMT protocol was administered for thirty neonates, 15- minutes/ day for 10 consecutive days. Thirty neonates were selected and assigned as control group who received routine care administered by the neonatal assigned nurse at NICU. Data was collected during the period from the beginning of April 2014 to the end of July 2015. The time spent for each neonate every day to collect the data ranged between 30-60 minutes. Every neonate was individually observed by the researcher throughout the determined time and make follow up until discharge to know his prognosis and length of hospital stay. Neonatal characteristics and biomedical data were obtained from neonatal records. Data of the LBW neonates including neonatal characteristics, anthropometric parameters (weight, length, and head circumference), and behavioral state, were measured through tool I, tool III and tool IV each day.

Tool II was administered to the intervention group only through applying the massage therapy protocol which similar to that reported by field's study in 1986 that consisted of both tactile and kinaesthetic stimulation using pure sunflower oil (10 mL/kg/day) each day up to 10 consecutive days through 15 minutes session/day that consisted of three standardized phases was applied for each neonate individually. Phase I (5 minutes tactile stimulation using sunflower oil) in which the neonate was placed prone position, Phase II (5 minutes kinaesthetic stimulation), and Phase III (5 minutes tactile stimulation using sunflower oil) in that phase the neonate was placed supine position.

RESULTS AND DISCUSSIONS

Table 1: Neonatal Characteristics for the Intervention and the Control Groups in Percentage Distribution (n=60)

Neonatal Characteristics	Intervention Group (n=30)		Control Group (n=30)		Test	P
	No	%	No	%		
Gender						
Male	16	53.3	14	46.7	x2 = 1.27	0.26
Female	14	46.7	16	53.3		
Age at admission(days)						
< 3days	28	93.3	27	90	t= 0.86	0.39
≥ 3days	2	6.7	3	10		
Mean± SD	1.4±0.9		1.2±0.9			
Birth Maturity						
Preterm	28	93.3	29	96.7	x2 = 2.79	0.25
Full term	2	6.7	1	3.3		
Gestational Age (Weeks)						
28 – 30	13	43.3	11	36.7	t =1.04	0.31
31 – 33	12	40	15	50	t =0.85	0.4
34 -40	5	16.7	4	13.3	t =0.62	0.74
Mean ± SD	32.7 ± 3.34		31.4 ± 3.46		t =74.8	0.39
Birth weight (grams)						
BW <1500 gm	19	63.3	21	70	t =0.87	0.39

1500 -< 2500 gm	11	36.7	9	30	t =-0.12	0.91
Mean ± SD	1409.4 ± 219.6		1401.4 ± 199.1		t = -0.15	0.88
Age at Start of the Study (Days)						
< 15 days	10	33	5	17	t- test = 1	0.32
15 - < 20 days	15	50	18	60		
≥ 20 days	5	17	7	23		
Mean ± SD	16.1± 3.4		16.9 ± 3.0			

***** Significant level at ≤ 0.05 ** Significant level at ≤ .001

Table(1), there were no statistically significant differences between the intervention and the control groups regarding to gender, age at admission, birth maturity, gestational age, delivery outcome, birth weight, age when sharing in the study, and medical diagnoses

Table 2: Mean Amount of Milk Intake/Day during the Study Period for both the Intervention and the Control Groups (n=60)

Mean Amount of Milk intake /day	Intervention Group (n=30)	Control Group (n=30)	t-test	P
	Mean± SD	Mean± SD		
1st day	232.8±32.4	235.2±31.6	-0.25	0.804
2nd day	244.8±35.4	247.2±48.5	0.633	0.529
3rd day	254.4±35.0	251.2±36.6	0.288	0.774
4th day	268 ±36.8	264±36.2	-0.007	0.994
5th day	276±39.2	267.2±30.3	0.679	0.500
6th day	280 ±39.8	267.2±29.5	1.328	0.189
7th day	280.8±41.2	269.6±31.0	1.424	0.160
8th day	285.6± 42.3	272.8±26.9	1.875	0.076
9th day	288±41.7	276.8±28.0	1.751	0.085
10th day	288.8 ±45	281.6±25.6	1.055	0.297
Grand mean (1st to 10th day)	269.92±38.9	263.28±32.4	2.26	0.03*

* Significant level at ≤ 0.05

Table (2) illustrated the mean amount of milk intake/day during the study period. There was no statistically significant difference related to the mean prescribed volume /day from the 1st day to10th day during the study period while there was statistical significant difference regarding to the grand mean amount of milk intake/day between the intervention and the control groups (p = 0.03).

Table 3: Mean Anthropometric Parameters Gain of Neonates for the Intervention and the Control Groups after the Study Period (n=60)

Items	Intervention Group (n=30)	Control Group (n=30)	t-test	P
	Mean± SD	Mean± SD		
Weight	254.70± 29.16	110.20± 50.98	-13.48	0.00**
Length	1.14± 0.24	0.48± 0.14	-12.78	0.00**
Head circumference	0.63± 0.08	0.31± 0.12	-12.21	0.00**

* Significant level at ≤ 0.05 ** Significant level at ≤ .001

Table (3) illustrated the total mean anthropometric parameters gain of neonates for the intervention and the control groups after the study period, there was highly statistical significant difference between the intervention and control groups regarding to the total mean of neonatal weight, length, and head circumference gaining after ten days of conducting OMT sessions (P= 0.00).

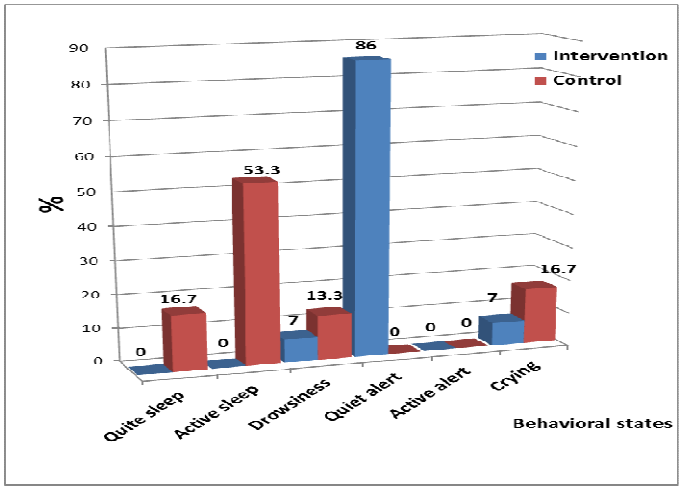

Figure 1: Mean Neonatal Behavioral State for the Intervention Group after OMT& the Control Group during the Study Period in Percentage Distribution (n=60)

Figure (1) illustrated that the mean behavioral state of neonates for the intervention group after OMT and the control group in percentage distribution. The majority of the neonates in the control group were in active sleep state (53.3%) compared to (7%) in the after OMT group while the majority of neonates in the after OMT group were in quiet alert state (86%).The crying state constituted in (7 and 16.7%) respectively in the intervention group after OMT and the control group during the study period.

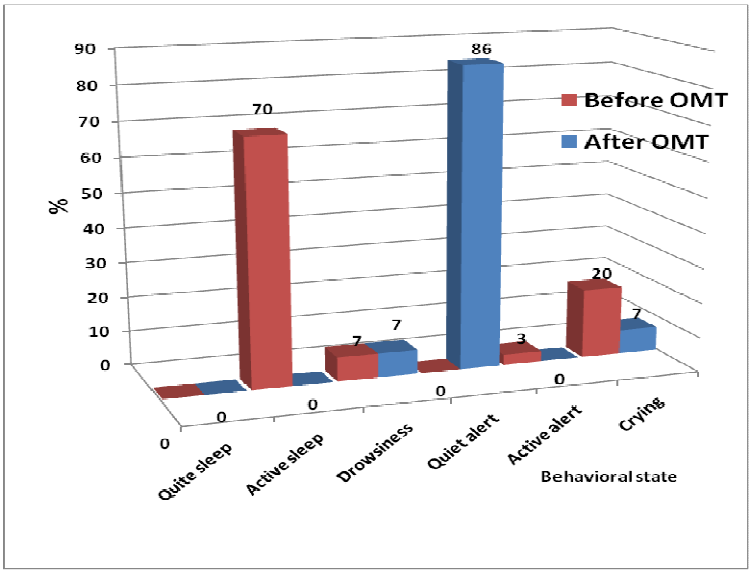

Figure 2: Mean Neonatal Behavioral State for the Intervention Group Before and after OMT during the Study Period in Percentage Distribution (n=30)

Figure (2) revealed that, the mean behavioral state of neonates for the intervention group before and after OMT in percentage distribution. The majority of the neonates in the intervention group before OMT were in active sleep state (70%) compared to (0.00%) in the same group after OMT while the majority of neonates in the intervention group after OMT were in quiet alert state (86%).The crying state constituted in (20% and 7%) respectively in the intervention group before and after OMT during the study period.

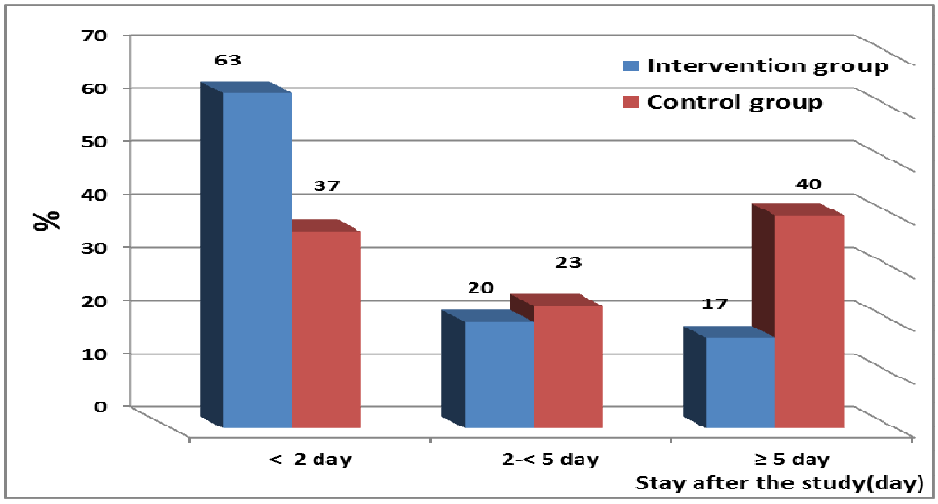

Figure 3: Mean Hospital Stay after the Study Period for the Intervention and the Control Groups in Percentage Distribution (n=60)

Figure (3) illustrated that the mean hospital stay after the study period for the intervention and the control groups in percentage distribution. The majority of the neonates in the intervention group stayed < 2 days after the study period (63.3%) compared to (37%) in the control group while the majority of neonates in the control group spend ≥ 5 days after the study period (40%) compared to (17%) in the intervention group.

The result of the current study revealed that there was highly statistical significant regarding to the neonatal weight gain after ten days of conducting OMT sessions (254.70± 29.16 and 110.20 ± 50.98 grams) respectively in the intervention and control groups. This study agrees with Salehi et al. (2015) who studied the effect of education and implementation of evidence-based nursing guidelines on infants' weight gaining in NICU, stated that weight gaining in intervention(OM) group was more than control group and it was statistically significant (P = 0.001).

This finding supported by Mirmohammadali, Hosseini-Baharanchi, Dehkordi, Bekhradi and Delaram, (2015) who studied the effect of massage with oils on the growth of term infants reported that massage with oil, especially sunflower oil is an inexpensive, simple, and effective intervention which improved weight gain in selected samples. As well Khan, Malik, Avtar, khurana, Bharadwaj, &singh (2015) who evaluated the effect of massage with or without oil on the weight gain of low birth and very low birth weight babies, concluded that the practice of oil massage has a good effect on weight gain in neonates.

Also, Saeidi, Ghorbani, and Moghadam (2015) who investgated the effect of massage with medium-chain triglyceride oil on weight gain in premature neonates who stated that the mean weight gain on the 7th day in the oil massage group was 105±1.3gr and 52±0.1gr in the massage group, whereas 54±1.3gr weight loss was observed in the control group. Significant differences were observed between the oil-massage group and the other group, respectively (P=0.000).

Fallah, Karbasi, Golestan & Fromandi (2013), who conducted the study to compare the efficacy of moderate pressure body massage with and without sunflower oil on growth parameters (weight, height and head circumference) of LBW preterm neonates, showed that massage with 10 ml/kg sunflower oil was more effective on weight gain of LBW

preterm infants. as well as Karbasi et al (2013) who studied effect of body massage on increase of LBW neonates' growth parameters and Mathew, (2012) who compared the effect of massage therapy with or without oil on neonate's sleeping pattern, crying spells and feeding pattern in postnatal wards of selected hospitals at Mysore, noted that body massage might be used as an effective and safe non-medical intervention for increasing of weight gain velocity in LBW preterm neonates.

Bayomi and El-Nagger (2015), who studied the effect of applying massage therapy on physical, physiological and behavioral states of premature neonates in Egypt and Saudi Arabia supported our findings, they stated that more than half of the intervention group gained from 150-200 gms at discharge after applying massage therapy. As well as, Kumar, Upadhyay, Dwivedi, Gothwal, Jaiswal & Aggarwal (2013). Who searched the effect of oil massage on growth in preterm babies, stated that there was significant difference in mean weight gain (476.7 g and 334.9 g respectively) in the intervention and control groups.

Regarding to the neonatal behavioral state, the current study results revealed that,the majority of the neonates were in active sleep state (70% and 53.3%) respectively in the before intervention and the control groups while, the majority of neonates in after intervention group were in quiet alert state (86%). These results supported with Soman (2012), Valizadeh, et al. 2012, and Field, et al (2010) they documented that, massage with oil improving sleep/wake pattern and makes the baby more alert, and shows fewer stress behavior as compared to those massaged without oil. As well, Kulkarni, et al (2010) reported that Infants who receive MT appear more alert and spend less time in sleep with less awakening during sleep.

Consistent with the current study Jansi, (2008), Kelmanson & Adulas (2006) who studied massage therapy and sleep behavior infant born with low birth weight, and Lee (2005) reported that LBW neonates subjected to massage, had improved quality of sleep experienced less sleep state, more awake state, with less awakening during sleep and appear more alert and active during the day.

This result in consistent with Hall, (2013) who studied the effects of massage therapy to induce sleep in preterm infants, reported that massage therapy promotes relaxation and lowers stress levels, evidenced by increased vagal activity and lower cortisol levels. As this regards, Badiee et al. (2012) confirmed that, premature neonates studies have documented increased weight gain, reduced stress and crying, decreased pain responses, enhanced maturation of electroencephalographic activity and visual function, improved neurologic, behavioral and motor development, a decrease pattern of fussiness and modified sleep patterns. As well Ang et al. (2012)whom founded that massage therapy for premature neonates reduced stress of them as reported by decreased pain responses and serum cortisol levels; improved motor, behavioral and their neurological development.

CONCLUSIONS

Based on the result of this study, the use of an individualized, evidence-based approach was strongly recommended to assist the LBW neonates in gaining weight. Evidence consistently suggests that OMT is a safe non-medical intervention and effective strategy to enhance the anthropometric parameters and improve behavioral state of stable LBW neonate.

RECOMMENDATIONS

Based on the findings of the current study, the following recommendations were suggested:

- Emphasize the importance of applying OMT that is effective and safe non-invasive intervention in all NICUs as standard of care.
- Further study should be conducted in all NICUs to assess the neonatal nurse's knowledge, attitudes and performance regarding OMT and its effect on health status of LBW neonates.

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Footnotes

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