The Effect of Massage Therapy on Weight and Length of Staying Premature Infant at Neonatal Intensive Care Units of Sohag city

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Abstract

In premature infants, weight gain becomes the main criterion for hospital discharge. Research has shown that massage therapy has led to weight gain in preterm infants when moderate pressure massage was provided. **The present studyaimed** to determine the effect of massage therapy on weight and length of staying of premature infant at Neonatal Intensive Care Units. The total sample included sixty low birth weight premature infants, who were selected from the Neonatal Intensive Care Units of Sohag Affiliated to the ministry of health hospitals. **Two tools were used**: Two tools were designed by the researcher, **Tool I:** Socio-demographic characteristics of premature infants and their feeding assessment of premature infant.**Tool II**: Measuring premature infant weight and recording premature infant daily physical assessment from one to seven days and measuring length stying at Neonatal Intensive Care Units.**Results:** The study revealed significant relation between infant massage and weight and length of staying of premature infant at Neonatal Intensive Care Units. **Conclusion**: massage therapy has positive effect on weight of premature infants and short thier length of staying at the hospital. **Recommendation** nurses who work in Neonatal Intensive care unit should receive training program on massage therapy to improve their practice which reflect on the general condition of premature infants.

Keywords: Massage Therapy, premature infants, weight, Length of staying, Neonatal Intensive Care Units.

Introduction

Premature infant survivors show a significant growth and development retardation, reflected by lower body weight, height and head circumference and poor motor, adaptive, social and language development in the first five years of life. Late in adult being, they remain at an upturn risk of cardiovascular and metabolic disorders (**Coutinho P,et al.,2011**)&(**Velez M,et al., 2011**).

Premature infant is defined by WHO as all births before 37 completed weeks of gestation or less than 259 days since the first day of a woman's last menstrual period. Premature birth can be further sub-divided based on gestational age: extremely preterm (<28 weeks), very preterm (28 - <32 weeks) and moderate preterm (32 - <37 completed weeks of gestation). Moderate preterm birth might be additional part to concentrate on late pre-term birth (34 - <37 completed weeks). The 37 week remove is to some degree self-assertive, and it is currently documented that although the risks connected with premature birth are greater the lower the gestational age, even infants born at 37 or 38 weeks have higher dangers than those born at 40 weeks of gestation (**Marlow N 2012**).

Massage therapy as a non-therapeutic interference may have positive effect on physical and developmental growth of preterm and LBW newborn infants including weight gain, decreased stress behavior, promotion of neurologic and neuro-motor development, better infant-parent emotional bonding, improved sleep, reduced rates of nosocomial infection and along these lines, decreased mortality of hospitalized premature infants (**Kulkarni A et al., 2010**).

Massage therapy has not any harmful effects and it can enhanced weight rapidity of more than 30 weeks of gestation and physically stable premature infants by different mechanisms. Increase Weight is the most common reliable stricture which is connected with massage therapy in premature infants (**Samsamshariat S & Pourmorshed P 2011).**

The primary communication that parents can make with their infant is by method of touch, and massage is a standout amongst the most appropriate methods for touching a newborn infant Therefore, infant massage is essential since because infants interpret touch as physical sign that they are loved. The impact of giving a newborn infant comforting skin massages is evident on several stages. For example, the brain contains psychological classifications that, from the first day of life, directly mediate social bonds and social feelings (**Cheng J et al., 2011) & (Kulkarni A et al., 2010**).

The care givers have to be properly instructed to avoid too strong a massage that may cause physical injury. Moderate pressure massage therapy and passive movement of the limbs

have been shown to result in weight gain in premature infants. **(Field T et al., 2010) & (Mukherjee S et al., 2011)**.

Aim of the study:

The study aimed to: Determine the effect of massage therapy on weight and length of staying of premature infant at Neonatal Intensive Care Units. .

Research hypothesis:

Premature infant who exposed to massage therapy was weight gain at neonatal intensive care units compared to premature infants who receiving hospital routines care.

The length of staying at the hospital were short among infant who exposed to massage therapy.

Subjects and Method:

Research Design:

Quasi experimental research design was used in this study.

Setting:

The study was conducted at Neonatal Intensive Care Units in the following setting:

Sohag University Hospital

Children Specialized Hospital at Sohag which is affiliated to the Ministry of Health.

Subjects:

Sixty premature infant in the above previously mentioned setting who admited at Neonatal Intensive Care Units.

The sample was divided into two equal groups: study and control group were randomly selected

Study group was received massage therapy while the control group was received the routine hospital care.

Inclusion Criteria of premature infant: Gestational age ranged from 28-37 weeks of gestation, birth weight of premature infants ranged from 900/gm to 2000/gm, premature infant with stable condition and both sexes (male and female).

Exclusion Criteria of premature infant: Congenital anomalies such as congenital heart disease cancer**,** sepsis**,** require surgery, and neurological disorder.

Tools of data collection:

Data was collected by using two tools**.**

The tools were designed by the researcher after reviewing the received literature to collect essential data about the premature infant.

Tool I: It was contained two parts:

Part I: Socio-demographic characteristics of premature infant as: age, sex and birth order, weight on admission, date of admission and such as discharge, reason for admission and diagnosis.

Part II: Feeding assessment of premature infant. This part was included: types of feeding of premature breast or bottle feeding or gavage feeding .Amount of every feeding per time and 24 hour, frequency, administration of gavage feeding and intra venous fluid .

Tool II: It was contained two parts:

Part I: - Measuring premature infant weight for seven days

Part II: Recording premature infant daily physical assessment from one to seven days and measuring length staying at hospital.

Pilot study: It was carried out on 10 % of the study and control premature infant for the purpose of modification and clarification. The designed tool was tested on premature infant who fulfilled the inclusion criteria to evaluate the content validity and reliability of the tools and to estimate the time required to fill in the sheets. Unclear items will be clarified, unnecessary items will be omitted and new variables will be added. Those who shared in the pilot study were excluded from the study sample.

Method for data collection:

Administrative process: An official permission will be obtained from the director of intensive care units of premature infants in Sohag city.

Informed Consent: mothers of low birth weight infants agreed to participate in this study after explaining both the purpose and importance of this study.

The study was conducted through data collection was started from march 2015 to July 2015

Data collection was done daily according the availability of cases, socio demographic data was obtained for record of premature infants and was randomly selected according the diagnosis and was divided into study and control groups.

Assessment of general condition of premature infants daily (signs and symptoms) was done.

Measuring of weight of study group twice daily during seven day before and after massage

Measuring anthropometric measurement (length, head and chest circumference) was taking before conducting massage to premature infants in the first day of massage and daily record and observation during one week, and compare between control and study groups.

Massage sessions will be conducted one hour after feeding the premature infants in a quite environment 5 minutes for rubbing the body, 5 minutes kneading the body and last minutes for kinesthetic stimulation and other supportive program for premature massage therapy from specialized internet

Implementation of massage therapy technique:

The massage will conduct to study group 15 minutes for two times daily for one week as the following technique:

Hands should be clean and fingernails short. All jewelers should be removed to avoid scratching, give you time to prepare, as being calm and focused will enhance the effectiveness of the massage, minimize noise, distractions and interactions. Ensure that the room i draught-free and that the temperature is

appropriate (not too hot and not too cold) and constant.

The researcher first introduced herself to the care giver of intensive care of premature unit and then explained the purpose of the study at the beginning of interview , so the care giver were reassured that all gathered information will be confidential. The title and objectives of the study were illustrated as well as the main data items to be covered and the study was carried out after gaining the necessary approval from the administrator of Specialized Hospital at Sohag which is affiliated to the Ministry of Health .

Each premature infant was conducted massage in first day for15minutes , twice daily for seven days ، From the top of the head to the neck and back to the top of the head, and back to the neck,from the neck across the shoulders; from the upper back to the waist and back to the upper back; from the thigh to the foot to the thigh on both legs and from the shoulder to the hand to the shoulder on both arms.

Followed by passive movements of the limbs for 5 minutes.

The newborn is placed in a supine position and each arm, then each leg, and finally both legs together are flexed and extended (as in a bicycling motion). Each flexion/extension motion lasts 10 seconds. This is again followed by 5 minute massage as depicted above.

Massage sessions was conducted one hour after feeding the premature infants in a quite environment 5 minutes for rubbing the body, 5 minutes kneading the body and last minutes for kinesthetic stimulation and other supportive program for premature massage therapy from specialized internet

Evaluation of the effect of massage therapy of premature infant:

Reassessment of weight monitoring during and after massage therapy session.

Reassessment of general condition, vital signs after massage therapy was implemented and evaluated massage**.**

Measuring long staying of the premature infants at the hospital.

Ethical considerations:

Parent of premature infant consent for participation was obtained after explaining the purpose of the study privacy of their information obtained from their parent are protected and confidentiality of parent premature infant, nature of the study and right to withdraw from the study at any time were explained.

Results:

Table (1): showed that Percentage distribution of premature infants related to biosocio demographic characteristics in study and control group it has founded that twenty percent (20.0%) of them gestational age at 28 - <32 weeks in study group of premature infant. while half (50%) of the premature infant in the

study group the gestational age at32-<36 weeks of gestation while in the control group it has founded that more than forty percent (43.3%).According to their sex it has founded that more than half (53.3%) of them were males in study group while more than thirty percent (63.3%) were female in control group. As regard birth weight it has founded that forty percent (40.0%) of premature infant 1200 – 1500gms in study group and thirty percent (30%) of them in the control group while twenty percent (20%) 1800 -2000gms in study group of premature infant. As regarded to admission weight it showed that more than thirty percent (33.3%) from 1500 to 1800gms while only (13.3%) ranged from 1800 to 2000gms in study group. It has observed that regarding diagnosis it has showed that more than three quadrant (76.7%) of the premature infant diagnosed Jaundice in study group, while half (50%) of the premature infant in control group. The same table also showed that regard to residence it has founded two third (60%) were come from urban area in study group while more than one third (36.3%) in control group. While forty percent (40%) of them come from rural area in the study group and more than sixty percent (63.4%) of them in the control group. As regard type of delivery, majority of both groups delivered caesarian section.

Table (2): Showed Percentage distribution of the premature infants according tomethod of feeding in study & control groups it was focused that the majority of the premature infants (96.7%) who giving artificial feeding in study group while (90%)in the control group. while only (20%) who given in the study group and it was founded thirty percent (30.0%) given gavage feeding in control group. While breast feeding it was observed most of them (83.3%) in study group, while in control group (73.3%) of premature infant.

Table (3): It was observed that at day seven in the study group and control group had were amount of feeding per one time therefore there was statistical significant difference between study and control group at moderate level of significant

Table (4): It was observed that at day seven in the study and control groups had amount of feeding per 24 therefore there was statistical significant difference between study and control group at moderate level of significant.

Table (5): showed the mean weight of premature infant of one day to seven day in the study and control groups it has founded with no significance difference in 1st day, 2nd day and 3rd day (p=> 0.05) but there were statistical significance difference in 5th day, 6th day and 7th day (p < 0.00) between study & control group, while there were moderate significance difference in 4th day (p < 0.00) between study & control groups.

Table (6): Described that weight gain of premature infants of study and control group at

one and seven day, it showed that Weight in 1st day mean±SD of the study group(1544.7±225.3) and control group (1639.5±200.2) , on Weight in 7th day was founded that mean±SD of the study group(1807.4±192.2) and control group (1650.2±250.8)with highly Statistical significance deference in the seventh day of massage between study and control groups study group. While no significance deference in day one in study and control groups.

Table (7): showed that the two thirds (60.0%) were discharged of the study group and forty (40.0%) stayed, and in the control group it was found out that only (3.3%) were discharged while the majority of them (96.7%) stayed. There was a highly significant difference in the length of stay (p < 0.00) between the study & control groups.

Table (8): Mean length of staying of hospitalization of studied premature infants in study and control groups, it reflected that mean of staying in hospital decrease among study group than control group with statistical significant differences (p<0.01) between study and control groups

Fig (1):-It was observed that the mean and standard deviation of length of premature infant of one day to seven day in the study and control groups with no statistical significance difference of length during one week (p=> 0.05) between study and control group.

Fig (2): Described that weight gain of premature infants of study and control group at one and seven day, it showed that Weight in 1st day mean±SD of the study group (1544.7±225.3) and control group (1639.5±200.2) , on Weight in 7th day was founded that mean±SD of the study group(1807.4±192.2) and control group (1650.2±250.8)with highly Statistical significance deference in the seventh day of massage between study and control groups study group. While no significance deference in day one in study and control groups.

Table (1): Percentage distribution of premature infants related to biosociodemographic characteristics in study and control group.

Characteristics of premature infants	Study group (n=30)		Control group (n=30)	
	No.	%	No.	%
Gestational age				
28 - <32	6	20.0	7	23.3
32- <36	15	50.0	13	43.3
36-<37	9	30.0	10	33.3
M$\pm$SD	31.6$\pm$2.8		31.1$\pm$2.1	
Sex				
Male	16	53.3	11	36.7
Female	14	46.7	19	63.3
Birth weight (gms)				
- 900- <1200	5	16.6	7	23.4
-1200-<1500	12	40.0	9	30.0
-1500-<1800	7	23.4	6	20.0
-1800-<2000	6	20.0	8	26.6
M$\pm$SD	1150.5$\pm$258.4		1154.5$\pm$262.1	
Admission weight (gm)				
- 900- <1200	7	23.4	8	26.6
-1200-<1500	9	30.0	9	30.0
-1500-<1800	10	33.3	8	26.6
-1800-<2000	4	13.3	5	16.6
M$\pm$SD	1144.8$\pm$257.3		1154.5$\pm$262.1	
Diagnosis				
Jaundice	23	76.7	15	50.0
Respiratory distress	7	23.3	15	50.0
Residence				
	12	40.0	19	63.4
Rural	18	60.0	11	36.6

Urban					
Type of Delivery					
Normal Vaginal Delivery	1		3.3	3	10.0
Cesarean Section	29		96.7	27	90.0

Ns: No statistically significant difference (p>0.05)

Table (2): Percentage distribution of the premature infants was checked according to method of feeding in the study & control groups.

Method of feeding#	Study Group (n=30)		Control Group (n=30)	
	No.	%	No.	%
Breast Feeding	25	83.3	22	73.3
Artificial feeding	29	96.7	27	90.0
Gavage feeding	6	20.0	9	30.0
Intravenous fluid	18	60.0	9	30.0

 # More than one answer might be given   Ns: No statistically significant difference (p>0.05)

* Statistically significant difference (p<0.05)

Table (3):- Mean amount of feeding per one time for studied premature infants were checked in the study & control groups.

Amount of feeding per one time	Study Group (n=30) Mean±SD	Control Group(n=30) Mean±SD	P. value
Day one	30±6	30±7	1.000
Day Seven	45±4	35±6	<0.001**

Ns: No statistically significant difference (p>0.05)   ** Statistically significant difference (p<0.01)

Table (4):Mean amount of feeding per 24/hours for studied premature infants in the study & control groups.

Amount of feeding per 24hours	Study Group (n=30) Mean±SD	Control Group (n=30) Mean±SD	P. value
Day one	180±36	180±42	1.000
Seven day	270±24	210±36	<0.001**

Ns: No statistically significant difference (p>0.05)   * Statistically significant difference (p<0.05)

** Statistically significant difference (p<0.01)

Table (5):Mean weight of premature infants was checked from day one to day seven in the study and control groups.

Weight (gram)	Study Group (n=30) Mean±SD	Control Group (n=30) Mean±SD	P. value
1st day	1544±225.3	1639 ±200.2	0.090
2nd day	1662±200.7	1582±217.5	0.146
3rd day	1698±205.5	1608±227.9	0.113
4th day	1745±202.8	1581±260.9	0.009**
5th day	1760±185.5	1607±257.3	0.012*
6th day	1789±181.1	1676±265.1	0.022**
7th day	1807±192.2	1650±250.8	0.017*

Ns: No statistically significant difference (p>0.05)

* Statistically significant difference (p<0.05)

** Statistically significant difference (p<0.01)

Table (6): Mean and standards' deviation of studiedpremature infants accords toweight gain in study and control group at one and seven day.

weight gain	Study Group	Control Group	p. value
Weight in 1st day	1544.7±225.3	1639.5±200.2	0.090
Weight in 7th day	1807.4±192.2	1650.2±250.8	0.008**

** Statistically significant difference (p<0.01)

Table (7):- Percentage distribution of premature infants was measured according to the length of stay of hospitalizations of premature infants between the study and control groups.

	Study group (no=30)		Control group (no=30)		p. value
	No	%	No	%	
Discharge	18	60.0	1	3.3	<0.001**
Not Discharge	12	40.0	29	96.7	

** Statistically significant difference (p<0.01)

Table (8):- Mean length of staying of hospitalization of studied premature infants in study and control groups.

	Study Group (n=30)	Control Group (n=30)	P. value
	Mean±SD	Mean±SD	
Length of staying	4.2±2.1	7.0±0.0	<0.001**

* Statistically significant difference (p<0.05)

Fig (1):-Mean and standard deviation of Length of premature infant of one day to seven day in the study and control groups.
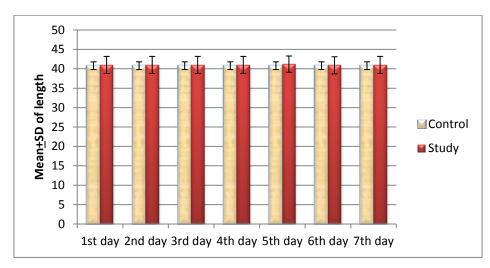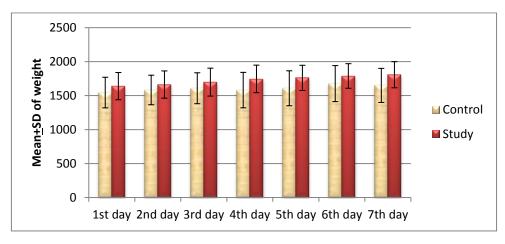
Fig (2): Described that weight gain of premature infants of study and control group at one and seven day.

Statistical Analysis:

Statistical presentation and analysis of the present study, the data were tested for normality using the Anderson-Darling test and for homogeneity variances prior to further statistical analysis. Categorical variables were described by **number and percent**, where continuous variables described by mean and standard deviation (**Mean, SD**). **Chi-square test** and fisher exact test used to compare between categorical variables where compare between continuous variables by **t-test** and ANOVA. **A two-tailed p < 0.05** was considered statistically significant. All analyses were performed with the **SP SS 20.0** software.

Discussion

Premature infant massage is beneficial and gratifying for the infant and family. It produces numerous positive emotional and behavioral effects in infants, such as enhances sleep quality (**Ferber et al., 2002**), improvement in circulation and improvement in immunological responses. Also, the

massage facilitates the mother–infant relation and helps reduce anxiety for both .The first communication that parents can create with their infant is by means of touch, and massage is one of the most suitable ways of touching an infant .Therefore, premature infant massage is important because infants interpret touch as physical evidence that they are loved (**Cetinkaya &Basbakkal 2012**)

The first part that has explored in the present study was tosocio-demographic characteristics of premature infants it includes, Gestational age, sex, Birth weight (gms), Admission weight (gm),Residence, Diagnosis and type of delivery.

The findings of the present study showed the socio-demographic characteristics of the studied premature infants according of gestational age founded that half (50%) of the premature infant the gestational age at 32-<36 weeks of gestation the same explanations mentioned by **Tekgündüz et al., (2014) who** reported that the infants' average birth weight and their average gestational age.

The current study is showed that more than half of premature infant male in study & control groups respectively. This finding is in congruence with **Lee (2005)** who reported that evaluate the effect of infant massage on weight gain, Physiological and behavioral responses in premature infants, the children, and point of view and reported that, there were less than half of them boys and more than half of them girls who received massage therapy.

In the present study, it is concluded that caesarean section (CS) is the most common method of delivery; it can lead to many health problems including preterm delivery and low birth weight; it is also in agreement with Lee, (2005)& Hyde and Berrington(2012)who mentioned that infants born by cesarean section have a significantly different physiology at birth compared to those born by vaginal delivery. The finding is also consistent with Choi et al., (2015) who mentioned that the most common as delivered cesarean section compared to those born by normal vaginal delivery. This is may be due to the most common premature infant is born by caesarean section due to maternal and newborn problem.

The present study illustrates that the majority of the premature infants who are given artificial feeding in both study and control group. On the other hand, breast feeding is more than eighty percent in the study group; but in the control group, it is about more than seventy percent of premature infants. It can be argued that the majority of premature infants are given artificial feeding because their hospitalization and special formula are given by physician.

The current study shows that the mean and standard deviation of the studied premature infants is in accordance with the amount of

feeding in the study & control groups. This indicates that there is moderate statistical significant difference. The results are also in accordance with **Tekgündüz et al., (2014)** who mentioned that when daily weight gain, abdominal circumference and gastric residual volume excess measurements which were analyzed, the differences between the first day and last day of the study were statistically significant in the massage group of premature infants. This is may be due to daily abdominal massage that increased gastric residual volume reflected that amount of feeding respectively.

The study shows the distribution of the premature infants according to the amount of feeding per 24hrs in the study & control groups; it shows that there is a moderate statistical significant difference of premature infants between the study and control group in the amount of feeding per 24hrs. The same finding has been identified by **Harrington &Haskvitz (2006**), who stated that the abdominal massage fast-tracks peristalsis by changing intra-abdominal pressure and creating a mechanical and reflexive effect on the intestines, decreasing abdominal distension and increasing intestinal movements. This is may be due to premature infant especially abdominal massage that increases peristalsis by changing intra-abdominal pressure in order to enhance abdominal capacity.

As regards anthropometric measurements (weight) of premature infant, the study illustrates in the study and control group during one week; it has no significant differences in first three days, but there is significant difference during last fourth day. This result agreed with **Dieter (2003) & Diego et al., (2006),** who found out that statistical significant difference in weight gain in the fifth day of the massage. The same finding also has been mentioned by **Field et al., (2010**) In terms of the frequency and duration of massage, greater weight gain had been consistently observed when administering for 15 min 3 per day. Frequency of massage therapy to premature infant abdominal capacity and circulation reflect that weight gain.

Also this study is similar to the result of **Miguel et al., (2014**) who reported that massage and exercise led to increased weight gain, through exercise which was associated with increased calorie consumption; massage was related to increased vagal activity. The finding is aggreement with **Deigo et al. (2006)** who suggested that moderate pressure massage stimulates vagal activity and leads to increased weight gain through two mechanisms, increased vagal activity and gastric motility leading to increased food absorption and increased weight gain and to the release of insulin and Insulin-like growth factor directly leading to greater weight

gain.**Khan (2015**) stated that most of the earlier conducted studies had used only weight gain as their outcome variable.

As regards the characteristics of the studied infants, the result of the current study reveals the length during one week between the study and control group of preterm infant in the study & control groups with no significant difference of length during one week. This finding is in agreement with **Mendes& Procianoy,(2008)** who failed to demonstrate any significant change in these anthropometric parameters (length). This study is also in agreement with **Schulzke et al., (2007) & Karbas etal., (2013)** who said that body massage for premature infant was not effective on length growth. But these results are opposite to **Khan (2015)** who stated that most of the earlier conducted studies had used only weight gain as their outcome variable as in the study, reported a significantly greater increment in length. Difference in head circumference was not significant. This may be due to greater increment of length need more time to increase in length.

This study illustrates that there are highly statistical significant differences in chest circumference of premature infant in the study group in the sixth and seventh day while there is statistical significance difference in fifth day, but there are statistical significance differences in the 3rd day and

4thday. This may be due to premature infant response to massage therapy after the second day is related to increase of calories consumption reflected through increase in chest diameter and weight gain.

Again, the current study shows that head circumference of premature infant in the study and control group during the one week with significant difference in the 2nd day. Also there are high statistical significant differences during the last fifth day between the study & control groups. It is opposite to the result of **Miguel et al, (2014**) who stated that head circumference is not significant difference between the study and control groups. The premature infant response to massage therapy after the second day related to increase of calories consumption reflected through increase of head circumference and weight gain.

According to **Rangey &Sheth (2014)** who pointed that moderate pressure massage with tactile stimulation can improve weight gain of premature neonates, alsoemphasized that, premature neonates with initial poor motor performance had significantly more improvement in motor and neurologic outcomes and decrease length of stay after applying massage when compared to those not receiving massage, also massage therapy was associated with shorter hospital stays in premature every low birth infants. These findings also agreed with **Diego et al. (2014)**

who suggested that tactile and kinaesthetic components are effective for promoting premature infant weight gain. The massage therapy enhances circulation so as to increase weight.

The present study described that, weight gain of premature infants of study and control group at one and seven day, it shows highly statistical significant significance difference in day one in study and control group. The same explanation was mentioned by **Moyer-et al., (2008**) &**Ragaaet al., (2015**) who documented moderate massage therapy increased weight within 5-10 days and less hospital stays than the control groups. Hospital stay for premature infants in the massage group was significantly shorter. The same explanations mentioned by **Mutlu et al.,(2011)&Ang et al., (2012)** whom revealed that, massage therapy enhanced immune system and less sepsis that leading to decrease length of hospital stay. Massage therapy improved immune system and less sepsis that leading to decline length of hospitalization.

It was noticed in the present study as regards the weight gain, there was a highly significance difference about increasing percentage of weight gain in premature infant in the study and control groups. The same explanations agreement with **Leonard (2008)**, who mentioned that the positive effects of massage therapy include increasing weight gain, this is the same way with **Diego et al.,**

2005, who reported significantly differences related to weight gain and moderate pressure massage therapy leads to increased gastric motility and weight gain. The rational the massage therapy increase gastric motility and food consumption that reflected to weight gain.

Conclusion

Premature infant who exposed to massage therapy experienced better weight gain and short duration of stay at NICU compared to premature infant who received routine hospital care.

Recommendations

Nurses in neonatal intensive care unit should receive training program related to massage therapy to improve their practice regarding general condition two times of premature infants during hospitalization.

Further studies are required to evaluate alternative methods to meet the needs of premature infants during transition from intra utrine life to extra utrine life.

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