

Research Article

The Effects of Baby Massage on Attachment between Mother and their Infants

Ayşe Gürol, PhD, RN^{1,*}, Sevinç Polat, PhD, RN²¹ Assistant Professor, Atatürk University, Health Services Vocational School, Erzurum, Turkey² Associate Professor, Bozok University, School of Health, Department of Pediatric Nursing, Yozgat, Turkey

ARTICLE INFO

Article history:

Received 16 December 2011

Received in revised form

22 February 2012

Accepted 22 February 2012

Keywords:

complementary therapies

house calls

nursing

SUMMARY

Purpose: This study was conducted to examine the effect of baby massage on attachment between mothers and their newborns.

Methods: This study was carried out from June 2008 to February 2010 in a quasi-experimental design (57 in the experimental group, 60 in the control group). Between the dates of the study, all healthy primipara mothers and their healthy babies were included. Data were collected regarding their demographic characteristics and by using the Maternal Attachment Inventory (MAI). All mothers were assessed on the first and the last days of the 38-day study period. In the experimental group, the babies received a 15-minute massage therapy session everyday during the 38 days.

Results: There was no significant difference found in the pretest mean value baseline of the MAI score in both groups. The posttest mean values of the MAI of the experimental group mothers (90.87 ± 10.76) were significantly higher than those of control group (85.10 ± 15.50). There was a significant difference between groups ($p < .05$).

Conclusion: The results of the study have shown that baby massage is effective in increasing the mother–infant attachment.

Copyright © 2012, Korean Society of Nursing Science. Published by Elsevier. All rights reserved.

Introduction

The first year of life is extremely important in terms of the baby's psychological development. It is during this period, that the sense of basic trust is formed. The relationship between the mother and the baby has been the subject of several recent research studies (Muller-Nix et al., 2004; Zeanah, Borris, & Larrieu, 1997). Attachment is an emotional and expected condition between the mother and the baby that begins in the first days of life (Soysal, Öktem, Ergenekon, Erdoğan, 2000). Attachment theory is an assessment of the response to the baby's physical and emotional needs (Mills-Koonce et al., 2007). According to Mercer, maternal attachment begins during pregnancy and continues with delivery (Zauderer, 2008). Maternal attachment is a unique, tender loving relationship that develops between the mother and the baby; its consistency leads to the development of feelings of trust in the baby as a result. Postpartum attachment and care between the mother and the baby is important for the baby to lead a physical, spiritual, and emotional health in life (Muller, 1994; Tilokskulchai, Phatthanasiriwethin, Vichitsukon, & Serisathien, 2002). Mothers

have an important role as the primary caregiver. If the relationship between mother and baby is inadequate, the baby may have severe developmental and psychological problems (Brandt, Andrews, & Kvale, 1998). Attachment is therefore accepted as one of the fundamental processes in order to improve psychological development and to establish the baby's relationship to the outside world (Wilson et al., 2000).

A healthy attachment is also of great importance in the determination of the baby's character and habits (Troy, 1995). The first touches greatly strengthen attachment behavior (Kavlak & Şirin, 2007). The sense of touch is very important in the newborn period and infancy for perceiving the environment. Proper stimulation of the baby's sense of touch affects psychosocial development positively (Uzuner, 1998). Massage is one of the easiest and most natural ways of establishing a sense of touch and eye contact which improves attachment between mothers and babies. The early contact between mother and her newborn gives confidence to the mother's breastfeeding, in addition to developing the mother's attachment behavior (Matthiesen, Ransjö-Arvidson, Nissen, & Uvnäs-Moberg, 2001).

Ferber et al. (2005) determined that mothers who applied massage to their premature infants achieved an easier interaction. Lee (2006) also reported that baby massage encourages the interaction between mother and baby. Moore and Anderson (2007) found that skin-to-skin contact between mother and infant

* Correspondence to: Ayşe Gürol, PhD, Atatürk University, Health Services Vocational School, 25240 Erzurum, Turkey.

E-mail address: ayseparlak42@gmail.com (A. Gürol).

affects the infants' health, decreases their crying, and increases the mother–infant interaction. Onozawa, Glover, Adams, Modi, and Kumar (2001) reported that the mother–infant interaction was increased among those mothers who had performed massage on their infants. In 2009, Kavlak and Şirin studied healthy babies and mothers to evaluate and determine validity and reliability of the Maternal Attachment Inventory (MAI) scale for the Turkish population. Moreover, Bal Yılmaz and Conk (2009) studied about mothers who had 15-day-old healthy babies to investigate the effect of 4-months of massage application on sleep duration, growth and development of babies, and mothers' anxiety levels. Bal Yılmaz and Conk reported that infants' sleep duration was increased when their mothers spent more time with them and applied massage therapy to them. In a study conducted with mothers who recently delivered healthy babies, İnal and Yıldız (2005) investigated the effect of massage applied for 6 months on the babies' growth and mental–motor development. İnal and Yıldız found statistically significant results that infants who received massage gained more weight and increased their mental–motor development. In a study conducted with premature and low birthweight babies and their mothers, Sarıkaya Karabudak and Öztürk (2008) reported that regularly applied baby massage positively affected weight gain and the mental–motor development of babies.

Massage therapy is one of the oldest forms of treatment in the world, having first been described in China during the second century B.C. and soon after in India and Egypt. Despite its long history and popularity, a Medline search yielded only approximately 200 articles from last 30 years. In the last 7 years, only 6 articles were published on baby massage in Turkey. Maternal attachment depends on two important factors; (a) interaction between mother and her baby and (b) sensual contact between them. Baby massage is the simplest and easiest way of communication, that makes contact between mother and her baby. At the eastern Anatolia, the families have many children. The mothers who live in this region generally avoid touching (sensual contact) their babies. The main reasons are cold weather conditions, socioeconomic conditions, and swaddling babies. In addition, there is no work regarding the effects of massage on mother–infant attachment in Turkey up to now. For this reason, this work has been carried out to determine the applicability of baby massage in Turkish families and its effects on the level of maternal attachment.

Purpose of the study

This study was conducted to examine the effect of baby massage on the mother–infant attachment. We hypothesize that infant massage strengthens the attachment between mother and baby.

Methods

Study design

A quasi-experimental design between the two groups (57 in the experimental group, 60 in the control group; see Figure 1) was conducted from June 2008 to February 2010 in the Obstetrics Clinic of Atatürk University Hospital and at the homes of mothers who were included in the research.

Setting and samples

Before the investigation, power analysis was used to decide the number of participants for sampling. In the case of 50 mothers in each group, to achieve a medium effect size with 95% confidence interval and .05 margin of error, it was calculated the investigation

would be at least .80 for *t* test. It is thought that some mothers may leave the investigation during the study so that 60 mothers were taken into each of the experimental and control groups. Our research started with 120 mothers and 117 mothers completed the study.

Between the dates of this study, all mothers who were admitted to the Atatürk University Obstetrics Clinic and who accepted the study conditions were included in the research. After informed consent was obtained, a nonprobability convenience sampling method was used to assign mothers to the experimental group or to the control group. The clinic doctor assigned the mothers to the experimental and the control groups respectively according to the admission dates. The mothers in the control group never met the mothers in the experimental group.

The sampling criteria of the study included the following; mothers who (a) resided in Erzurum city center, (b) had graduated from at least secondary school, (c) did not have any conditions that would prevent them from applying massage, (d) did not have sight or hearing deficits, (e) were open to communication and cooperation, (f) had not previously trained in terms of baby massage, (g) were primipara, (h) were breastfeeding, (i) had babies with the birth weight of 2,600–4,000 g, born in the 38th–42nd gestational week, 1st and 5th minute Apgar scores > 7, and who (j) had given birth to a single baby.

Data collection tools

MAI: A widely used instrument for measuring maternal attachment to the infant is the MAI (Muller, 1994) and its conceptual basis is attachment theory. This suggests that certain inborn behaviors in human neonates are exhibited in order to bring a protective nurturing attachment figure to close proximity, and that the human adult responds to these infant attachment behaviors (Shin & Kim, 2007). This closeness provides the infant with security and gratification, and becomes a basis for future relationships (Muller).

The MAI was developed to measure maternal affectionate attachment. This is the unique, affectionate relationship that develops between a woman and her infant. It persists over time, and is a key element of maternal adaptation (Muller, 1994). The MAI consists of 26 items representing maternal activities and feelings that indicate affection. Before development of the MAI, maternal affectionate attachment had been most frequently determined by observing the rate or pattern of maternal attachment behaviors (Muller). Observational measures, however, are time-consuming and generally difficult to apply in a clinical setting. In addition, there is little agreement that one behavior or group of behaviors constitutes evidence of maternal attachment. By direct measurement of mothers' feelings through the MAI, these validity concerns in relation to interpreting mothers' behaviors can be avoided. Although maternal persons' feelings about their infants are not sufficient to define the complexity of mother–infant attachment, they are thought to be indicators of the probable presence of attachment (Shin & Kim, 2007).

The MAI was designed to measure maternal affectionate attachment using a 4-point Likert-type 26-item single dimensional scale in which each item varies between *almost always* and *almost never*. Each item has direct statements. Points are calculated accordingly in the scale where *almost always* = 4 points, *often* = 3 points, *sometimes* = 2 points and *almost never* = 1 point. The higher the scores obtained from the inventory mean that the maternal attachment is higher. The lowest score that might be obtained from the inventory is 26, and the highest score is 104 (Kavlak & Şirin, 2009). Validity and reliability studies of the inventory in Turkey were conducted by Kavlak and Şirin, and Cronbach's alpha values

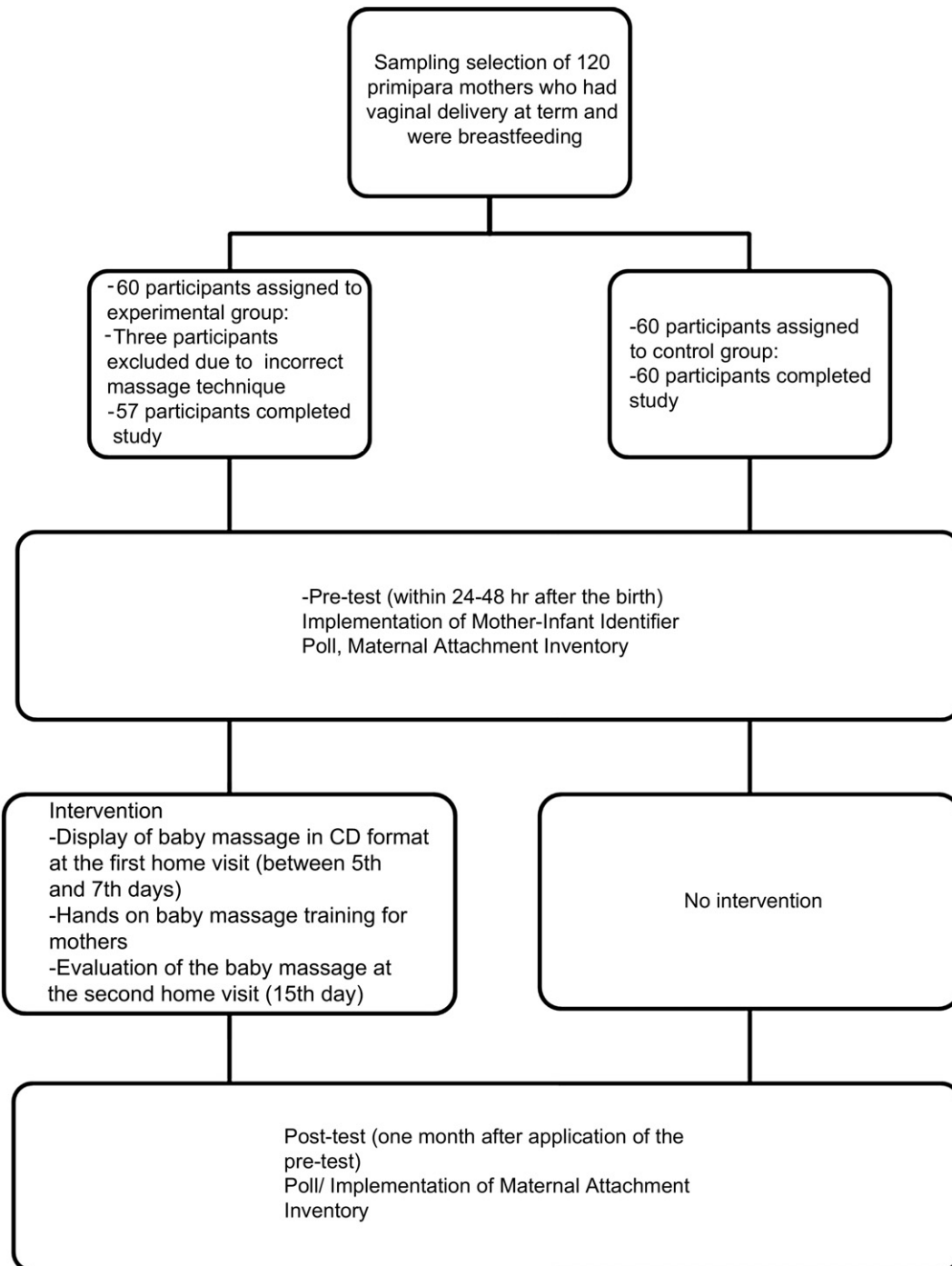


Figure 1. Study design.

for mothers were found to be .77 in the first month and .82 in the fourth month. In this study the Cronbach's alpha value of the inventory was determined as .96 immediately after the birth and .95 after one month.

Data collection

Data were collected by using Implementation of Mother–Infant Identifier Poll (demographic characteristics of the mothers, including parental age, education, and baby's gender) and the MAI.

The mothers in the experimental and control groups were applied a pretest within 24–48 hours of the birth, after their informed consent about the research was received. Posttest data were obtained during the home visits paid to mothers in the experimental and control groups approximately 1 month after completion of the pretest within the 38-day study period. The MAI was collected on the first and the last days of the study. The first day data was collected in hospital, and the last day data was collected in the homes of mothers from both the experimental and control groups.

Nursing intervention

During the study period, all mothers continued to receive their routine medical care, which included physician's examinations and medications. The mothers were given medications such as oxytocin, and methylergonovine that were used in the birth and postpartum first day. Routine care as provided by Atatürk University Obstetrics Clinic was given to all mothers whereby each postpartum mother and baby is in the same room for the first half an hour. The breastfeeding nurse gives the mother breastfeeding education in the clinic and the first breastfeeding is carried out under supervision in the mother's hospital room. The first encounter between researcher and each study participant was made in each mother's private hospital room. MAI was filled out by conducting observations when all the mothers did not have any medical procedures undertaken in the Obstetrics Clinic.

Sixty mothers who were receiving routine care were assigned to the control group—this group received no home visits by the researcher during the study period. On the last day of the study, the MAI was filled out after completion of the pretest in the control group's mothers' home. Then the baby massage information, which was given the experimental group, was given to the control group's mother in the same way.

Fifty-seven mothers who were receiving routine care were assigned to the experimental group. Following a telephone conversation, the first home visit was conducted with the mothers in the experimental group at their convenience 1 week after the birth (between 5th and 7th days after birth). The babies' mothers were taught how to do massage by a trained researcher, who has PhD degree on pediatric nursing and a certificate on baby massage, during the first home visit. A further two visits were made to the mothers' homes on the 15th and 38th days following the first visit by a trained researcher. In addition, baby oil (Baby Oil Natural Calm, pH 5.5; Johnson & Johnson, New Brunswick, NJ, USA) and baby massage brochures and CD prepared by a company were given to the mothers. Mothers were informed about the benefits of baby massage, duration of application, points of care for application and application technique on the first visit. Baby massage brochures and CD provided additional education resources. The technique of massage application was shown to the mother using a model baby. Mothers were asked to apply the massage on the model as instructed and they were observed to determine whether they applied the massage correctly or not. Mothers were re-instructed on points where they had not applied the technique adequately by evaluating their skills at every phase of the massage. Once the mother was confident with the technique the education was terminated by applying massage to the baby together with the mother. The time taken for providing instruction about the massage, the mothers applying the massage and then the researcher correcting any points that were inadequate was determined as approximately 1 hour. The massage was applied according to the manufacturer's protocol (Field, Diego, Hernandez-Reif, Deeds, & Figuereido, 2006; Johnson & Johnson, 2008). The massage techniques were a combination of effleurage and petrissage to the baby's face, neck, shoulders, arms, chest, back, waist and legs. The effleurage consisted of smooth, long, rhythmic strokes up either side of the spine and out across the shoulders, with both hands working simultaneously, while the petrissage consisted of gentle kneading. Additionally, slow steady pressure was applied intermittently to the shoulders, neck, face, and lower back. All massages were demonstrated by the same trained person and mothers were advised to choose a moment when both she and her child are relaxed and calm; a half hour after the baby had eaten was recommended. Baby massage education was given twice at the first home visit and the second home visit (15th day). The mother's

application of baby massage was observed at the second home visit and evaluated for correct technique. These babies received 15-minute massage sessions every day of the week for 38 days; the number of massage sessions are a minimum of 30 and a maximum of 38 (Field, 2002). The researcher followed a detailed visit-by-visit protocol to help women improve their health-related behaviors, the care of their baby, and observed the status of baby massage application. On the last day of the study, the MAI was filled out on the last home visit in the experimental group.

Data analysis

Data analyses were conducted by using SPSS, version 15.0 (SPSS Inc., Chicago, IL, USA). The descriptive properties of demographic characteristics are given as percentiles and means. Chi-square tests and one-way analysis of variance tests were used for the comparison of control and experimental groups. Paired sample *t* test was used to compare intragroup measures. Independent paired sample *t* test was used to compare intergroup measures and to compare the difference between the two groups' pretest and posttest mean values. The confidence interval was 95%. A $p < .05$ was considered statistically significant.

Ethical considerations

Permission to undertake this study was gained from the Atatürk University Health Sciences Institute Ethics Board. Informed consent was obtained from each participant either verbally or in written form from mothers who agreed to participate in the study. The mothers were informed of the purpose of the research prior to the beginning of the study and were assured of their right to refuse to participate or to withdraw from the study at any stage (Karataş, 2000). No support was received from Johnson & Johnson; only their baby oil, baby massage brochures, and CD were used.

Results

The mothers in each group were comparable in age, education, and the gender of their babies. Mothers did not display any differences in demographic variables (Table 1). No significant differences were found between the two groups in the type of medication they received. Comparison of experimental and control groups in accordance with the identifying characteristics of mothers and babies are presented in Table 1. No statistically significant difference was found between the groups ($p > .05$).

In the experimental group, it was determined that 49.1% of mothers were aged 26–35 years, 75.4% were secondary school graduates, 89.5% were unemployed, 54.4% were living with their immediate family, expenses of 56.1% were equal to their monthly income and 54.4% were receiving support for baby care and home duties. It was found out that 56.1% of the babies were male.

In the control group 60% of mothers were aged 26–35 years, 75% were secondary school graduates, 85% were unemployed, 63.3% were living with their immediate family, expenses of 50% were equal to their monthly income and 70% were receiving support for baby care and home duties. In this group 61.7% of the babies were male.

Table 2 shows the intragroup and intergroup comparison of the pretest and posttest total mean values of experimental and control group mothers obtained from MAI. There was no significant difference between the two groups for the pretest total mean MAI score in intergroup comparisons. The MAI posttest means of the experimental group applying massage to their babies (90.87 ± 10.76) was statistically higher than the mean value of the

Table 1 Comparison of Demographics and Infant Characteristics in Experimental and Control Groups

Characteristics	Experimental group		Control group		Total		F/ χ^2 /p
	n	%	n	%	n	%	
Age group (yr)							
16–25	27	47.4	19	31.7	46	39.3	F = 2.359
26–35	28	49.1	36	60.0	64	54.7	p = .099
≥36	2	3.5	5	8.3	7	6.0	
Education level							
Secondary school	43	75.4	45	75.0	88	75.2	$\chi^2 = 0.027$
High school	8	14.0	9	15.0	17	14.5	p = .936
University	6	10.5	6	10.0	12	10.3	
Employment condition							
Employed	6	10.5	9	15.0	15	12.8	$\chi^2 = 0.523$
Unemployed	51	89.5	51	85.0	102	87.2	p = .415
Family type							
Nuclear family	31	54.4	38	63.3	69	59.0	$\chi^2 = 0.967$
Extended family	26	45.6	22	36.7	48	41.0	p = .124
Income*							
Income less than expenses	16	28.1	20	33.3	36	30.8	$\chi^2 = 0.485$
Income equal to expenses	32	56.1	30	50.0	62	53.0	p = .785
Income more than expenses	9	15.8	10	16.7	19	16.2	
Receiving support for baby care and domestic work							
Receiving support	31	54.4	42	70.0	73	62.4	$\chi^2 = 3.037$
Not receiving support	26	45.6	18	30.0	44	37.6	p = .180
Gender of baby							
Female	25	43.9	23	38.3	48	41.0	$\chi^2 = 0.369$
Male	32	56.1	37	61.7	69	59.0	p = .851
Total	57	100.0	60	100.0	117	100.0	

* Income is validated according to the mothers' own statements.

control groups (85.10 ± 15.50) and the difference between the groups was found to be statistically significant ($t = -2.351, p < .05$).

It was found that the MAI pretest mean of the experimental group (88.12 ± 15.19) increased upon applying massage to their babies (90.87 ± 10.76) and the difference between groups was statistically significant ($p < .001$). The MAI pretest total means of control group mothers was 84.28 ± 17.60 and posttest total mean obtained from the inventory (85.10 ± 15.50) was slightly increased, with the difference between groups being statistically significant ($p < .05$).

We calculated the average delta change between pretest and posttest after procedure total means value for the MAI for the massage and control groups. In Table 2, the comparison of the mean delta change between massage and control groups is given and shows a significant difference between mean delta changes for MAI of the two groups ($p < .05$).

Discussion

When the maternal attachment levels of experimental group mothers applying massage to their babies and control group mothers not applying massage to their babies were compared in posttest measurements, it was found that the maternal attachment of the group applying massage significantly higher ($p < .001$). Maternal attachment of the control group also increased in the posttest measurement; however, this increase was very low when compared to the experimental group. The relative youth of the mothers and the fact that they were undertaking the primary care of their first baby increased compliance with the study and attachment. This may explain the minor increase in maternal attachment behavior of mothers in the control group. In Turkish culture, children are very precious and important. Women want to have a child as soon as they get married. If a woman does not have

Table 2 Experimental and Control Group Mothers' Maternal Attachment Inventory Pretest and Posttest Mean Values and Comparison of Point Difference Means

Maternal attachment inventory	Pretest	Posttest	$\bar{X}_D \pm SD^b$	t	p ^c
	M \pm SD ^a	M \pm SD			
Experimental group (n = 57)	88.12 \pm 15.19	90.87 \pm 10.76	2.75 \pm 5.26	-3.947	p < .001
Control group (n = 60)	84.28 \pm 17.60	85.10 \pm 15.50	0.81 \pm 2.65	-2.380	p = .036*
t	-1.260	-2.351	2.492		
p ^d	p = .312	p = .043*	p = .018*		

Notes. MAI = Maternal Attachment Inventory.

^a M is the total mean values of mothers in both experimental and control groups to MAI scale in pretest and posttest measurements.

^b \bar{X}_D is the difference between total mean values of mothers in both experimental and control groups to MAI scale in pretest and posttest measurements.

^c Paired sample t test.

^d Independent sample t test.

*p < .05.

a baby, she is exposed to negative reactions from her husband and his family. Being a mother is very important, in particular, to have a male baby is extremely important. For this reason, it is expected that maternal attachment level naturally increases. The aim of this study is to determine how baby massage affects this increase. The massage effect was determined between mean delta changes for MAI of two groups and explained in Results section. This result confirms the hypothesis of the study—Baby massage strengthens the attachment between mother and baby. Most of the mothers in both groups were 26–35 years of age group, who are graduates of secondary school and not working. Traditionally, these women's common goal is to get married and give birth to a child in the eastern part of Turkey. However, educated women have more roles than being a partner or a mother.

For those women who are non-working secondary school graduates may accept a baby as a guarantee for her future and marriage. It may thus be stated that those mothers who get support for baby care and housework may have benefited more, spending more time on themselves and their babies.

Baby massage for primary caregivers and high-risk babies is now used more often. It is reported that massage regulates the baby's sleep, respiration and urinary requirements; decreases colic and stress; and affects mother–infant interaction in a positive way (Underdown, Barlow, Chung, & Stewart-Brown, 2006). Ferber et al. (2005) determined that mothers giving massage to premature babies had more interaction with their babies. In their studies, Moore and Anderson (2007) found out that skin-to-skin contact between the mother and the baby in the early period affected the health status of baby, decreased crying and increased mother–infant interaction. Onozawa et al. (2001) reported that the interaction between the mothers giving massage and their babies increased more than those who did not give massage. Similarly, Wendland-Carro, Piccinini, and Millar (1999) determined that babies in the experimental group were more responsive to their mother's voice and touch, and attachment between mother and baby increased as a result of training based on mother–infant interaction given to primipara mothers. In other previously conducted studies (Onozawa et al.; Chiu & Anderson, 2009), it was emphasized that baby massage had several positive effects on depressed adolescent mothers. In their study of postnatally depressed mothers, Glover, Onozawa, and Hodgkinson (2002) reported that mothers in the massage class had better interaction with their babies. Simpson (2001) also highlighted that baby massage was beneficial in successful mother–infant interaction. Similar to the findings of these other studies on this subject, it is found in the current study that baby massage increases mother–infant attachment.

Conclusion

Mothers are instructed in breast-feeding by nurses but they receive no education for baby massage in the hospital where the study was conducted. Additionally, nurses caring for newborns do not receive any education about baby massage and mother–baby attachment in the context of their on-the-job training. Thus, in this study, strengthening mother–baby attachment has been achieved through baby massage education given to the mothers.

Baby massage is a simple, cheap and effective technique supporting infant development. It is accepted as a new practice that is gradually gaining popularity by being applicable to both the babies and their mothers; it can be performed independently. However, many mothers do not know that they can communicate with their babies by touch as they think that they may easily hurt their babies. Those mothers should be instructed by using various interactive

methods such as tactile, visual, auditory contact. For those families who cannot have direct early contact with their baby for various reasons, nurses should advise them that this situation would not directly cause a problem. Their concerns should be alleviated because although early contact is a factor that strengthens attachment development, it is not an essential prerequisite.

The effects of massage in terms of mother–baby attachment and other general benefits for baby health should be considered; all medical personnel, especially nurses, should encourage mothers to apply massage to their babies. Encouraging the use of massage will provide an important contribution to healthy babies. In the literature, the effects of baby massage on the maternal attachment levels in mothers with healthy infants and weight gain of preterm infants have been investigated. Mothers with babies, who were born prematurely or had some defects or illness, have more risk of attachment deprivation. Accordingly, it might be suggested that nurses include baby massage among the routines of mother and baby care in both healthy and illbabies, and that facilitating baby massage and mother–infant attachment should be included in the internal training given to neonatal nurses as well as providing counseling to the mothers in this regard.

In the postpartum period, nurses should regularly observe mother–baby relationship and take notes of the attachment process. Indications of appropriate attachment behavior include mothers calming, touching, hugging her baby; talking to the baby; using appropriate feeding techniques; making eye contact; and calling the baby with the name or gender (“my boy/my girl”). Nurses should explain the characteristics of the baby to the mother in a warm, polite, and interactive environment and let the mother discuss her expectations about her baby. The nurse should also inform the mother about the baby's hearing, sight and reflexes. Clues about insufficient baby care could be when mothers call the baby by a nickname; the baby having insufficient weight gain; the baby being dirty and neglected, thus impeding hygienic care and leading to severe nappy rash. In such a situation, the nurse should counsel the mother, let her talk about her feelings towards the baby and instruct the mother about baby care while supporting her activities. By recognizing that attachment is a multifactorial process, nurses should strengthen the family's coping strategies whenever possible, encourage the family with their baby care and support their developing parenthood roles.

Nurses have responsibility not only for the initiation of mother–infant attachment but also in its maintenance. This is especially the case with mothers who are very young and primiparous, and who may require more support.

Limitations

There are several limitations to our study, namely that (a) mothers were not randomized to the experimental and control groups, (b) there was a small sample size and the sample was self-selected, and (c) mothers in the control group may have applied baby massage to their child following other sources of information.

Conflict of interest

We declare no conflict of interest that may bias our study findings.

Acknowledgments

We thank the mothers who participated in this study. This research was supported by Atatürk University Research Fund,

under project no. BAP 2008/246. This manuscript comprises a part of Ayşe Gürol's doctoral dissertation.

References

- Bal Yılmaz, H., & Conk, Z. (2009). The effect of massage by mothers on growth in healthy fullterm infants. *International Journal of Human Sciences*, 6, 969–977.
- Brandt, K. A., Andrews, C. M., & Kvale, J. (1998). Mother-infant interaction and breastfeeding outcome 6 weeks after birth. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, 27, 169–174.
- Chiu, S. H., & Anderson, G. C. (2009). Effect of early skin-to-skin contact on mother-preterm infant interaction through 18 months: Randomized controlled trial. *International Journal of Nursing Studies*, 46, 1168–1180.
- Ferber, S. G., Feldman, R., Kohelet, D., Kuint, J., Dollberg, S., Arbel, E., et al. (2005). Massage therapy facilitates mother-infant interaction in premature infants. *Infant Behavior and Development*, 28, 74–81.
- Field, T. (2002). Preterm infant massage therapy studies: An American approach. *Seminars in Neonatology*, 7, 487–494.
- Field, T., Diego, M. A., Hernandez-Reif, M., Deeds, O., & Figuereido, B. (2006). Moderate versus light pressure massage therapy leads to greater weight gain in preterm infants. *Infant Behavior and Development*, 29, 574–578.
- Glover, V., Onozawa, K., & Hodgkinson, A. (2002). Benefits of infant massage for mothers with postnatal depression. *Seminars in Neonatology*, 7, 495–500.
- İnal, S., & Yıldız, S. (2005). Effect of regular baby massage on growing and mental and motor development of healthy term babies. *Nursing Bulletin*, 13(54), 35–52.
- Johnson & Johnson. (2008). Retrieved April 10, 2008, from <http://www.johnsonsbaby.com/bonding-with-baby-a-guide-to-infant-massage>
- Karataş, N. (2000). Ethics in nursing studies. *Journal of Nursing Studies*, 1, 5–8, 27.
- Kavlak, O., & Şirin, A. (2007). Maternal and paternal attachment and the role of nurse. *Journal of Ege University School of Nursing*, 23, 183–194.
- Kavlak, O., & Şirin, A. (2009). The Turkish version of maternal attachment inventory. *International Journal of Human Sciences*, 6, 188–202.
- Lee, H. K. (2006). The effects of infant massage on weight, height, and mother-infant interaction. *Journal of Korean Academy of Nursing*, 36, 1331–1339.
- Matthiesen, A. S., Ransjö-Arvidson, A. B., Nissen, E., & Uvnäs-Moberg, K. (2001). Postpartum maternal oxytocin release by newborns: Effects of infant hand massage and sucking. *Birth*, 28, 13–19.
- Mills-Koonce, W. R., Gariépy, J., Propper, C., Sutton, K., Calkins, S., Moore, G., et al. (2007). Infant and parent factors associated with early maternal sensitivity: a caregiver-attachment systems approach. *Infant Behavior and Development*, 30, 114–126.
- Moore, E. R., & Anderson, G. C. (2007). Randomized controlled trial of very early mother-infant skin-to-skin contact and breastfeeding status. *Journal of Midwifery and Women's Health*, 52, 116–125.
- Muller-Nix, C., Forcada-Guex, M., Pierrehumbert, B., Jaunin, L., Borghini, A., & Ansermet, F. (2004). Prematurity, maternal stress and mother-child interactions. *Early Human Development*, 79, 145–158.
- Muller, M. E. (1994). A questionnaire to measure mother-to-infant attachment. *Journal of Nursing Measurement*, 2, 129–141.
- Onozawa, K., Glover, V., Adams, D., Modi, N., & Kumar, R. C. (2001). Infant massage improves mother-infant interaction for mothers with postnatal depression. *Journal of Affective Disorders*, 63, 201–207.
- Sarikaya Karabudak, S., & Öztürk, C. (2008). The effect of massage on growth development of premature infants and babies with low birth weight. *Journal of Ege University School of Nursing*, 24, 27–42.
- Shin, H., & Kim, Y. H. (2007). Maternal Attachment Inventory: Psychometric evaluation of the Korean version. *Journal of Advanced Nursing*, 59, 299–307.
- Simpson, R. (2001). Baby massage classes and the work of the International Association of Infant Massage. *Complementary Therapies in Nursing and Midwifery*, 7, 25–33.
- Soysal, A.Ş., Öktem, F., Ergenekon, E., & Erdoğan, E. (2000). Study of birth type variable on attachment pattern. *The Journal of Clinical Psychiatry*, 3, 75–85.
- Tilokskulchai, F., Phatthanasiriwethin, S., Vichitsukon, K., & Serisathien, Y. (2002). Attachment behaviors in mother of premature infants: A descriptive study in Thai mothers. *Journal of Perinatal and Neonatal Nursing*, 3(16), 69–83.
- Troy, N. W. (1995). The time of first holding of the infant and maternal self-esteem related to feelings of maternal attachment. *Women's Health*, 32(3), 59–72.
- Underdown, A., Barlow, J., Chung, V., & Stewart-Brown, S. (2006). Massage intervention for promoting mental and physical health in infants aged under six months. *Cochrane Database of Systematic Reviews*, 18, CD005038.
- Uzuner, Y. Y. (1998). Importance of touch. *Nursing Forum*, 1(6), 245–255.
- Wendland-Carro, J., Piccinini, C. A., & Millar, W. S. (1999). The role of an early intervention on enhancing the quality of mother-infant interaction. *Child Development*, 70, 713–721.
- Wilson, M. E., White, M. A., Cobb, B., Curry, R., Greene, D., & Popovich, D. (2000). Family dynamics, parental-fetal attachment and infant temperament. *Journal of Advanced Nursing*, 31, 204–210.
- Zauderer, C. R. (2008). A case study of postpartum depression and altered maternal-newborn attachment. *MCN: The American Journal of Maternal/Child Nursing*, 33, 173–178.
- Zeanah, C. H., Borris, N. W., & Larrieu, J. A. (1997). Infant development and developmental risk: a review of the past 10 years. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 165–178.