Therapeutic Touch Modalities and Premature Neonate’s Health Outcome: A Literature Review

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Abstract

Background: In Neonatal Intensive Care Unit (NICU), the premature infant is often placed under incubator, phototherapy and with several cords and tubing connected all over body. They are subjected both to highly stressful environment (noise, bright light, frequent care related handling) and are often deprived of tactile stimulation that they would otherwise experience in general mothering care. The study explored literatures searching different modalities of giving therapeutic touch and its impact on pre-term infant in NICU.

Results: The study explored different modalities of therapeutic touch- Gentle Human Touch, Supporting Holding, Massage technique, tactile stimulation, Tactile-kinesthetic stimulation and Yakson. All identified therapeutic touch modalities had shown several positive outcomes for pre-term neonates in NICU.

Conclusion: As a non-invasive technique, therapeutic touch in any of the therapeutic modalities may be construed as providing developmentally appropriate, family centered care to the preterm neonates in NICU.

Keywords: Therapeutic touch; Touch therapy; Preterm infant; NICU; Massage therapy; Tactile kinesthetic stimulation

Introduction

The health and well-being of a neonate is greatly influenced by its maturity, birth weight, labor process, quality of intrapartum care, and the quality of neonatal care. Normally, at birth the neonate is generally handed over to mother for initiation of breast feeding and skin to skin contact, and thus the mother and child begins to bond. However, when a baby is prematurely born (< 37 weeks of gestation), due to a variety of reasons, the baby is usually separated from its mother for several days to several months for more intensive care in Neonatal Intensive Care Unit (NICU). Thus, the infant in NICU often receives less human contact than the baby born under normal conditions [1]. In NICU, the infant’s tactile experiences can be uncomfortable or painful that can lead to touch aversion. It is possible that providing pleasurable touch experiences can help to develop touch acceptance. Kangaroo mother care or skin-to-skin care is an emerging practice in the labor room and NICU which does encourage contact, and thus the mother and child begins to bond. However, when a baby is prematurely born (< 37 weeks of gestation), due to a variety of reasons, the baby is usually separated from its mother for several days to several months for more intensive care in Neonatal Intensive Care Unit (NICU). Thus, the infant in NICU often receives less human contact than the baby born under normal conditions [1]. In NICU, the infant’s tactile experiences can be uncomfortable or painful that can lead to touch aversion. It is possible that providing pleasurable touch experiences can help to develop touch acceptance. Kangaroo mother care or skin-to-skin care is an emerging practice in the labor room and NICU which does encourage contact, and holding of the infant [2-4].

Systematic application of touch is a therapeutic modality and is specifically applied to help the infant grow and develop [5]. However, the rapidly growing and developing central nervous system of the premature infant is more vulnerable to environmental effects [6]. Therefore, it is imperative that environmental stimuli such as touch and movement be carefully provided with constant monitoring of the infant’s individual responses, and modified appropriately. Negative behavioral responses to touch and handling of fragile, preterm infants were studied to result in reflexive responses such as the startle reflex, increased movement, agitation and/or crying, or other observable avoidance responses [7-9]. It has been identified that neonatal nurses lack specific knowledge in the area of therapeutic touch [10]. The present study explored several literatures on therapeutic touch modalities and its impact on pre-term health to identify best evidences for clinical practice.

Therapeutic Touch Modalities and its Impact on Preterm Neonates

In medically stable, growing preterm infants, therapeutic touch is reported to have a variety of short-term benefits including greater weight gain, shorter hospitalization, reduced incidence for complications etc. [11-14]. The following modalities of therapeutic touch have been identified:

1. Gentle human touch: In response to the recognition that small, fragile preterm infants are reported to significantly react to tactile stimulation; several researchers have implemented a “gentle human touch” model of providing tactile interaction with infants with significant developmental outcomes [15-18]. Gentle human touch nursing interventions were found to be non-aversive or stressful to preterm infants (27 to 32 week’s gestational age) with several positive, beneficial behavioral effects [19].

2. Supporting holding: Even when the infant is fragile, there are methods of providing touch that can be promoted for parents. Supportive holding, with a hand to the infant’s head and feet or body may be an intervention that is not distressing to the infant [20,21].

3. Massage technique: The stimulation of pressure receptors leads to increased vagal activity which, in turn, seems to mediate the diverse benefits noted for massage therapy. Field et al. found moderate pressure massage is essential for promoting growth in an infant [22].
In another literature, Field, et al. investigated the amount of pressure needed, while massaging, for optimal results. Sixty-eight preterm infants were randomly assigned into a light pressure or moderate pressure massage therapy group. The two groups were massaged for 15 minutes each session (3 sessions a day) using the Field technique over a 5-day period. Weight gain was recorded over the duration of the study and behavior state, stress behaviors, and heart rate were recorded on the first day. The results showed that the moderate massage group gained more weight and also showed a decrease in fussiness, crying, and stress behavior [23].

A review article by Kulkarni et al. explored several literatures supporting beneficial effects of massage therapy. Different hypotheses were put forward regarding the mechanism of action and described techniques of the massage therapy. Massage was found to be more useful when some kind of lubricant oil was used [24].

In a Random cluster design, the efficacy of massage therapy in preterm neonate by mothers and trained professionals were compared in terms of weight gain in a 10 day study period. Both the treatment groups gained significantly more weight compared to the control group [25].

4. **Tactile stimulation:** It has been identified in a literature by Ferreira et al. that infants who received regular tactile stimulation not only had a shorter hospital stay, but these infants also had increased daily weight gain. These infants also showed improved coordinated movements, range of postures, along with hand and face movement control [26]. A within-subjects, counterbalanced repeated measures study by Weiss, determined the effects of six different types of verbal and tactile stimuli on infants hospitalized for congenital heart disease. Infants were systematically assigned to different sequences of the various stimuli. Measures of arousal included heart rate, blood pressure, respiration, and activity level. Results indicated that the use of touch conducive to neural excitation (i.e., intense, vigorous, extensive touching of highly innervated body areas) produced higher heart rates, and systolic blood pressure as well as greater activity, than did other types of tactile stimulation or soothing verbal stimulation [27]. Helders et al. revealed that tactile stimulation programme in very low birth weight infants result in better auditory responses, more variations in hand movements, less hypotony, more sucking, and less bradycardia and apnea [28].

5. **Tactile-kinesthetic stimulation:** Tactile kinesthetic stimulation involves body stroking and passive movements of the limbs of preterm infants. Kuhn CM et al. found that Tactile kinesthetic stimulation had fairly specific effects on maturation and/or activity of the sympathetic nervous system [29]. In a randomized controlled trial study, Aliabdai et al. randomly allocated 40 LBW neonates into test (n=20) and control (n=20) groups. Tactile-kinesthetic stimulation was provided for three 15 minute periods per day for 10 consecutive days to the test group, with the massages consisting of moderate pressure strokes in supine and prone position and kinesthetic exercises consisting of flexion and extension of limbs. All measurements were taken before and after completion of the study. Study result showed a trend towards increased daily weight gain and better adaptive behavior with no adverse effects on physiologic parameters [30].

Ferreira et al. evaluated the effect of tactile and kinesthetic stimulation on behavioral and clinical outcome in preterm neonates. Preterm infants weighing <2.500 grams, with no significant perinatal asphyxia were allocated to two groups: a control group (CG) in which no intervention was made (n=16) and a study group (SG) in which the newborn infants received tactile and kinesthetic stimulation (n=16). Study results showed a trend towards a shorter duration of hospital stay, increased daily weight gain and a predominance of self-regulated behavior (regular breathing, state of alertness, balanced tonus, a range of postures, coordinated movements, hand-to-face movement control, suction, grip, support) in infants in the study group [31].

In a prospective randomized clinical trial, Massaro et al. effects of massage with or without kinesthetic stimulation (KS) on weight gain and length of stay (LOS) in medically stable premature (<1500 g and/or <or=32 weeks gestational age) neonates was assessed. For infants with BW>1000 g, average daily weight gain was increased in the intervention groups (only M and M with KS groups) compared to control (no intervention). The effect was mainly attributable to the M with KS group [32].

Field et al. administered tactile/kinesthetic stimulation in preterm neonates (mean gestational age, 31 weeks; mean birth weight, 1,280 g) for three, 15-minute periods per day for 10 days. The stimulated neonates averaged a 47% greater weight gain per day, were more active and alert during sleep/wake behavior observations, and showed more mature habitation, orientation, motor, and range of state behavior on the Brazelton scale than control infants. Finally, their hospital stay was 6 days shorter [33].

6. **Yakson:** Yakson is a Korean touching method for healing and relaxation similar to Gentle Human Touch (GHT). A quasi-experimental study on Yakson therapy, by Im et al. was conducted on preterm infants (26-34 weeks gestational age) in the NICU. Yakson consisted of three five-minute phases for 15 minutes: resting the hand on the infant, gentle caressing, and resting the hand again. GHT consists of just hand resting for 15 min twice a day for 15 days while the control group received usual nursing care. After Yakson or GHT, the infants exhibited an increased percentage of sleep states and a decreased percentage of awake and fussy states, suggesting that Yakson is another touching method that is not aversive or stressful to preterm infants, and which may provide several positive effects on preterm infants [34].

Browne’s recommendations for thoughtful decision making related to therapeutic touch in NICU [35]
- Modify all handling/touch to be supportive, sensitive, calm and in synchrony with the infant’s sleep-wake states as well as behavioral cues.
- Monitor behavioral responses during all handling/touch procedures and modify interactions appropriately.
- Individualize touch and handling based on the infant’s responses, timing and continuity needs, as well as parent preference.
- Avoid massage in all small fragile infants who are medically unstable, on ventilators and who may have significant post procedural discomfort should be provided as gentle handling as possible.
- Assist parents in identifying the type of touch and handling that is most appropriate for the infant concern.

**Summary**

Therapeutic touch in preterm neonates by different modalities was reported to have several positive outcomes. Moderate massage resulted in more weight gain and a decrease pattern of fussiness, crying, and stress behavior, Tactile stimulation conducive to neural excitation was
reported to result in better auditory responses, more variations in hand movements, less hypotony, more sucking, and less bradycardia and apnea. Tactile and kinesthetic stimulation showed a trend towards a shorter duration of hospital stay, increased daily weight gain and a predominance of self-regulated behavior in infants in the study group. Yaksic and Gentle human touch therapies exhibited an increased percentage of sleep states and a decreased percentage of awake and fussy states in neonates. Mere supportive holding, was also found to be non-distressing to the infant.

Conclusion

Therapeutic touch modalities were found to have several positive outcomes. As a non-invasive technique, therapeutic touch in any of the therapeutic modalities may be construed as providing developmentally appropriate, family centered care to the preterm neonates in NICU.

References

1. Anderson GC, Moore E, Hepworth J, Bergman N (2003) Early skin-to-skin contact for mothers and their healthy newborn infants. Cochrane Database Syst Rev: CD003519.
2. Ludington-Hoe SM, Swith JY (1996) Developmental aspects of kangaroo care. J Obstet Gynecol Neonatal Nurs 25: 691-703.
3. Affonso D, Bosque E, Wahlberg V, Brady JP (1993) Reconciliation and healing for mothers through skin-to-skin contact provided in an American tertiary level intensive care nursery. Neonatal Netw 12: 25-32.
4. de Leeuw R, Colin EM, Dunnebier EA, Mirrirmian M (1991) Physiological effects of kangaroo care in very small preterm infants. Biol Neonate 59: 149-155.
5. Lindrea KB, Stainton MC (2000) A case study of infant massage outcomes. MCN Am J Matern Child Nurs 25: 95-99.
6. Als H (1997) Neurobehavioral development of the preterm infant. Neonatal-Perinatal Medicine. St. Louis: C.V. Mosby. 964-989.
7. Sweeney PK, Blackburn S (2013) Neonatal physiological and behavioral stress during neurological assessment. J Perinat Neonatal Nurs 27: 242-252.
8. Leonard J (2008) Exploring Neonatal Touch Mind Matters: The Wesleyan Journal of Psychology 3: 39-47.
9. Zahr LK, Balian S (1995) Responses of premature infants to routine nursing interventions and noise in the NICU. Nurs Res 44: 179-185.
10. Aita M, Goulet C (2003) Assessment of neonatal nurses’ behaviors that prevent overstimulation in preterm infants. Intensive Crit Care Nurs 19: 109-118.
11. Dominguez Rosales R, Alhar Marín MJ, Tena García B, Ruiz Pérez MT, Garzón Real MJ, et al. (2009) Effectiveness of the application of therapeutic touch on weight, complications, and length of hospital stay in preterm newborns attended in a neonatal unit. Enferm Clin 9: 11-5.
12. Field T, Schanberg SM (1990) Massage alters growth and catecholamine production in preterm neonates. Advances in Touch: New Implications in Human Development. New Jersey: Johnson and Johnson. 96-104.
13. Hernandez-Reif M, Diego M, Field T (2007) Preterm infants show reduced stress behaviors and activity after 5 days of massage therapy. Infant Behav Dev 30: 557-561.
14. Adamsson-Macabo EN (1985-86) Effects of tactile stimulation on low and very low birth weight infants during the first week of life. Current Physiological Research and Review 4: 305-308.
15. White-Traut RC, Nelson MN, Silvestri JM, Cunningham N, Patel M (1997) Responses of preterm infants to unimodal and multimodal sensory intervention. Pediatr Nurs 23: 169-175, 193.
16. Harrison L, Olivet L, Cunningham K, Bodin MB, Hicks C (1996) Effects of gentle human touch on preterm infants: pilot study results. Neonatal Netw 15: 35-42.
17. Modrichin-Mc Carly (1993) The physiological and behavioral effects of gentle human touch nursing intervention on preterm infants. Doctoral Dissertation. University of Tennessee. Dissertation Abstracts International 54: 1336.
18. Tribottet SJ (1990) Effects of gentle human touch on the premature infant. In Advances in Touch: New Implications in Human Development. N.J.: Johnson and Johnson: 80-89.
19. Modrichin-Talbot MA, Harrison LL, Groer MW, Younger MS (2003) The biobehavioral effects of gentle human touch on preterm infants. Nurs Sci Q 16: 60-67.
20. Corff KE (1993) An effective comfort measure for minor pain and stress in preterm infants: Facilitated tucking. Neonatal Netw 12: 74.
21. Harrison L (1992) Effects of gentle human touch on preterm infants: Results from a pilot study. Infant Behav Dev 15: 12.
22. Field T, Diego M, Hernandez-Reif M (2010) Moderate pressure is essential for massage therapy effects. Int J Neurosci 120: 381-385.
23. Field T, Diego MA, Hernandez-Reif M, Deeds O, Figuereido B (2006) Moderate versus light pressure massage therapy leads to greater weight gain in preterm infants. Infant Behav Dev 29: 574-578.
24. Kulkarni A, Kaushik JS, Gupta P, Sharma H, Agrawal RK (2010) Massage and touch therapy in neonates: the current evidence. Indian Pediatr 47: 771-776.
25. Ferber SG, Kuint J, Weller A, Feldman R, Dollberg S, et al. (2002) Massage therapy by mothers and trained professionals enhances weight gain in preterm infants. Early Hum Dev 67: 37-45.
26. Ferreira AM, Bergamasco NH (1999) Behavioral analysis of preterm neonates included in a tactile and kinesthetic stimulation program during hospitalization. Infant Behav Dev 22: 137-143.
27. Weiss SJ (1992) Psychophysiological and behavioral effects of tactile stimulation on infants with congenital heart disease. Res Nurs Health 15: 93-101.
28. Holders PJ, Cats BP, van der Net J, Debast SB (1988) The effects of a tactile stimulation/range-finding programme on the development of very low birth weight infants during initial hospitalization. Child Care Health Dev 14: 341-34.
29. Kuhn CM, Schanberg SM, Field T, Symanski R, Zimmerman E, et al. (1991) Tactile-kinesthetic stimulation effects on sympathetic and adrenocortical function in preterm infants. J Pediatr 119: 443-440.
30. Alibadi F1, Askary RK (2013) Effects of tactile-kinesthetic stimulation on low birth weight neonates. Iran J Pediatr 23: 289-294.
31. Ferreira AM, Bergamasco NH (2010) Behavioral analysis of preterm neonates included in a tactile and kinesthetic stimulation program during hospitalization. Rev Bras Fisioter 14: 141-148.
32. Massaro AN, Hammad TA, Jasso B, Aly H (2009) Massage with kinesthetic stimulation improves weight gain in preterm infants. J Perinatol 29: 352-357.
33. Field TM, Schanberg SM, Scafidi F, Bauer CR, Vega-Lahr N, et al. (1986) Tactile/kinesthetic stimulation improves weight gain in preterm infants. J Neonatol 16: 60-67.
34. Im H, Kim E (2009) Effect of Yakson and Gentle Human Touch versus usual care on urine stress hormones and behaviors in preterm infants: a quasi-experimental study. Int J Nurs Stud 46: 450-458.
35. Browne JY (2000) Considerations for touch and massage in the neonatal intensive care unit. Neonatal Netw 19: 61-64.