

Effectiveness of Massage Therapy For Preterm Infants: A Literature Review

Lia Dian Ayuningrum¹

¹Departement of Midewifery, Faculty of Health Science, Universitas Alma Ata, Jalan Brawijaya No. 99
Yogyakarta, Indonesia 55183

ABSTRACT

Background: Preterm birth is associated with significant costs to health systems, and families of preterm newborns often experience considerable psychological and financial hardship. Preterm infants are greater risk of a range of short-term and long-term morbidities. Common complications of preterm infants are high rates of respiratory distress syndrome, sepsis, infections, visual and hearing problems, feeding difculties and delayed growth. Physical growth restriction has been considered an one of preterm global problem.

Objectives: The aim of this study was to analyze the literature relating to massage therapy in preterm infants and summarize the benefits of therapy.

Methods: The method used in finding articles was a literature review, using the keywords. Search was conducted electronically using several databases, including Pubmed, Science Direct, and Google Scholar

Results: The massage therapy contribute positive impact on preterm development. Massage therapy not only provides comfort but also improve physical growth, sleep quality, physcological strees and another beneficial as for mothers.

Conclusion: Massage therapy has benefits for preterm infants.

Keywords: *Preterm Infants, Preterm, Massage Therapy*

INTRODUCTION

Based on the Global Strategy for Women, Children and Adolescents Health (2016-2030), one of the goals is survival and preventable deaths, which is an effort to reduce neonatal mortality less than 12/1000 live births and deaths in children under 5 years of age less than 25 / 1000 live births.[1] About 73% of under-five deaths occur in two regions in 2017, WHO Africa (49%) and WHO Southeast Asia (24%) (WHO, 2017). The same statement is also from one of the Sustainability Development Goals (SDGs) targets, namely Reducing Infant Mortality (IMR) in 2030. Birth condition of the infants was to be one of various factors that influencing an Infant mortality and morbidity. Preterm infants as all infants was births before 37 completed weeks of gestation, or fewer than 259 days from the first date of a woman's last menstrual period. (WHO) Complications of preterm infants were the leading cause of death in children younger than 5 years of age globally in 2016, accounting for approximately 16% of all deaths, and 35% of deaths among newborn babies.[2]

Preterm birth is associated with significant costs to health systems, and families of preterm newborns often experience considerable psychological and financial hardship.[3] Although the risks of mortality and morbidity are much higher in early gestation (<34 weeks), late preterm birth (34<37 weeks) occurs more often, and newborn babies born late preterm have significantly higher risks of adverse outcomes than babies born at term.[4]

Preterm birth still was a global problem, in South Asia and Africa was occur more than 60% of preterm infants. On average 12% of infants were born too early in the lower-income countries compared with 9% in higher-income countries. Indonesia was in number 5th of the greatest number countries with preterm infants as 675 700. [5] WHO, 2018.

Preterm infants are greater risk of a range of short-term and long-term morbidities. Common complications of preterm infants are high rates of respiratory distress syndrome, sepsis, infections, visual and hearing problems, feeding difficulties and delayed growth.[6] Anthropometric growth restriction has been considered an one of preterm global problem.[7]

In addition to the initial sensory deficiency, prematurity raises other related factors, such as the absence of bonding attachment due to the need to remain in the neonatal intensive care unit (NICU), which has critical exposes infants to chronic stressor,

painful, parental separation, noxious stimuli and frequent of all those associated with unnormally growth and developmental outcomes in infants.[8] [9]

MATERIALS AND METHODS

The method used in finding articles was a literature review, using the keywords of Massage therapy, Preterm infants, Massage for preterm. Search was conducted electronically using several databases, including in Pubmed founded 59 publications about massage therapy, in Science direct founded 241 publications of massage therapy and in Google scholar founded 1.120 of massage therapy.

After screening of titles and abstracts and elimination of duplicates, 60 studies were selected for retrieval of full text. These were excluded if; they were irrelevant to the research question; could not be accessed. The 45 articles selected for retrieval of full texts were subjected to inclusion and exclusion criteria. After reviewed and consensus, 25 studies were excluded and 20 studies were included for this review. Inclusion criteria were; population were preterm infants with gestational age of 32 – 37 weeks and birth weight of ≤ 2500 grams; intervention were massage with oil or/and without oil. Study design were included were Systematic review, Meta-analysis, Quasi-experimental studies. Outcome were development as measured in physiological and behavioral responses, weight gain, reduction pain. This research ranging from 2015 until 2019.

RESULTS

Massage therapy is one way of treatment care that is mostly done in preterm infants who are treated in the NICU or/and infants who was stable and home. One of the studies conducted by Choi et al, they showed the massage therapy make a comparisons for physical growth and has the potential effects on gastrointestinal function in preterm infants. The massage in the NICU as long for 28 times on 14 days might be utilized as a part of developmental care. [10] Infants who followed massage therapy have a more constant growth especially their growth gain compared to infants who only follow the NICU procedurs.[11]

The psychology like an activity and behaviour stress were the indicator from infant growth too besides the physical growth. Massage therapy can

reduce behaviour stress and activity of preterm infants that in NICU. This is indicated by stress reduction or pacifying effect. Preterm infants who follow massage therapy with olive oil make a positive effect on their pain scores, pain responses at discharge and mental development long-terms at 12 months.[12] Another research showed that a moderate pressure with sunflower oil massage can increase significant in the fifth-day and average daily weight gain and make the shorter of NICU length stay.[13]

A recent study found that infants who were massaged had higher cognitive score at 12 months corrected age, higher mental development scores at 6 months of age.[14] Another study showed that beside using a sunflower oil, massage for preterm infants can use a virgin coconut oil (VCO), researcher explained the VCO helps in dermal maturity and made a better outcome of neurodevelopmental.[15] Another study showed that a massage in preterm infants made a significantly less awake state ($p=0.003$), crying ($p=0.03$), motor activity ($p=0.001$) and greater mean of sleep states ($p=0.003$).[16]

Massage therapy make a significant benefits as a stabilization of the Autonomic Nervous System (ANS), promotion of development growth and shorter hospitalized.[17] One of an ANS measured was a vagal tone. ANS was quantified by heart rate variability. Another benefits of massage therapy showed the Heart rate variability was increased and suggesting an improved ability to manage NICU related stressors. [18] Preterm infants have a recommendation to relief a stress and pain by a massage as a multisensorial interventions.[17]

Massage for preterm infants not only for the NICU care but the treatment can be continued in home when the infants was stable. Massage can be followed by the mother of infants that have an experienced or trained by nurse in hospital. A recent study showed the H-Hope plus Kinesthetic with VCO that allowed in home and make a greater growth.[19]

DISSCUSSION

Massage is the expression of affection between parents and children through touch on the skin that has an incredible impact. The massage for infants are a part of touch or moderate pressure. A massage is a procedural therapy as mechanically and manually act, whereas massage are a process of transferring mechanical energy and the systematic application of tactile stimulation, which can be applied by using a variety of techniques and can be done by

nursing or mothers to obtain certain physiological or psychological effects.[20][21] A massage is one of the non-pharmacological therapies for reducing or relieve pain. Stimulate massage causes a fast moving impulse of the peripheral nerve receptors reach the first gate door of the pain impulse and running more slowly along the pain fibers. Then the brain receives and interpreted in general a massage sensation and does not receive a pain.

Preterm infants are easily to get a complications as long their life. Many treatment were developed to make an intensify their care. Many research showed that massage therapy be one of a part for preterm be better, not only for NICU care but continued when the babies are home too.[19] Preterm infants are more easily to loose the available skin stimulation during intrauterine development through skin contact with the amniotic fluid and the mother uterine wall. Most research on preterm infants were focussed about physical growth and mechanisms the massage.

Stimulation for preterm infants can be like a tactile, kinesthetic, vestibular, auditory and combination each other. Massage therapy in preterm can be explained as the manually technique to superficial soft tissue of the skin, muscles, tendon, ligaments and fascia using the hand by nursing or mother of the baby[6]. A recent study reported that the massage therapy have many beneficial effects for preterm infants like increasing weight gain, height and head circumference with significantly as long for 14 days. Another research that combine a massage with oil showed the mean weight gain on the seventh day was 105 g for the oil massage group, 52 g for the non-oil massage group and 54 g weight loss for the control group. The greater weight gain by the intervention group could be related to the oil being absorbed by the skin. Another study reported the massage with oil used be related to increased vagal activity leading to greater gastric motility resulting in more efficient absorption and the infants will easy to milk.

Somatic and kinesthetic stimulation has beneficial effects on neuromotor development and anthropometric. The stimulation not only make a positive impact to infants, but for their families especially mother and make shorter of hospitalization. [22] Intervention like a massage therapy and kinesitherapy can improve the anthropometric development, reduce growth-related morbidity in the short, medium and long term with a low-cost and easy administer.[22] Weight and hospitalized most commonly reported outcome infants research.

Behind the reports, massage has another beneficial like a reduces pain during painful procedures[12] Another study reoported, the neonatal abstinence syndrome that given a massage alleviated infants symptoms of withdrawal while promoting mother-infant bonding.[23]

The recent study that H-Hope plus Kinesthetic with VCO well be done and showed that their sample, preterm infants who were stable and home that followed the treatment can increasing body weight, height and circumference. The massage were be done by infants mother and make a mothers more intens-caring to their babies.[19] In this research, massage therapy during 14 days showed that have a positive impact and a clearly effective to promote the physcal growth with the value are 2.0 (high effect), 1.3 (medium effect) and 1.8(High effect) on the body weight, height and circumference results. Another study reported that early intervention such as massage by baby-mothers that is relatively easy to administer and has the potential to give insight bonding and positive effects on neurodevelopment. [24]

CONCLUSIONS

Based on analysis done by the authors, massage therapy have a positive impact on preterm development such as massage therapy not only provide comfort but can improve sleep quality, promoting physcal growth, psychological stress that will eventually accelerate the baby's growth.

The present review suggest that a clear benefit is obtained from the administration of both of therapy in premature infants care. Massage therapy can be optimized by developing it into a procedural of premature infants care in the NICU and continued at home. The therapy might be used an effective, safe non-medical intervention and relatively low-cost intervention that can be implemented at preterm infants.

REFERENCES

1. J. Howson, CP; Kinney, MV; Lawn and (World Health Organization), "Born Too Soon: The Global Action Report on Preterm Birth. executive summary," *New Dir. yohttps://www.who.int/uth Dev.*, 2013.
2. UNICEF, "United Nations Inter-agency Group for Child Mortality Estimation (UN IGME), 'Levels & Trends in Child Mortality. Report 2015', United Nations Children's Fund, New York, 2015, available from <www.childmortality.org>.," *UNICEF WHO World Bank Gr. United Nations*, 2015.
3. A. Bérard, M. Le Tiec, and M. A. De Vera, "Study of the costs and morbidities of late-preterm birth," *Arch. Dis. Child. Fetal Neonatal Ed.*, 2012.
4. M. J. Teune *et al.*, "A systematic review of severe morbidity in infants born late preterm," *Am. J. Obstet. Gynecol.*, 2011.
5. H. Blencowe *et al.*, "National, regional, and worldwide estimates of preterm birth rates in the year 2010 with time trends since 1990 for selected countries: A systematic analysis and implications," *Lancet*, 2012.
6. T. Field, "New Born Massage Therapy," *Int. J. Pediatr. Neonatal Heal.*, vol. 1, no. 2, 2017.
7. F. García-Muñoz Rodrigo, J. Figueras Aloy, P. Saavedra Santana, and A. García-Alix, "Postnatal growth at hospital discharge in extremely premature newborns in Spain," *An. Pediatr.*, 2017.
8. A. L. D'Agata, M. R. Sanders, D. J. Grasso, E. E. Young, X. Cong, and J. M. Mcgrath, "UNPACKING THE BURDEN OF CARE FOR INFANTS IN THE NICU," *Infant Ment. Health J.*, 2017.
9. L. K. Badr, B. Abdallah, and L. Kahale, "A meta-analysis of preterm infant massage: An ancient practice with contemporary applications," *MCN Am. J. Matern. Nurs.*, 2015.
10. H. J. Choi, S. J. Kim, J. Oh, M. N. Lee, S. H. Kim, and K. A. Kang, "The effects of massage therapy on physical growth and gastrointestinal function in premature infants: A pilot study," *J. Child Heal. Care*, 2016.
11. S. A. Karbasi, M. Golestan, R. Fallah, M. Golshan, and Z. Dehghan, "Effect of body massage on increase of low birth weight neonates growth parameters: A randomized clinical trial," *Int. J. Reprod. Biomed.*, 2013.

12. B. Abdallah, L. K. Badr, and M. Hawwari, "The efficacy of massage on short and long term outcomes in preterm infants," *Infant Behav. Dev.*, 2013.
13. P. A. Taheri, Z. Goudarzi, M. Shariat, S. Nariman, and E. N. Matin, "The effect of a short course of moderate pressure sunflower oil massage on the weight gain velocity and length of NICU stay in preterm infants," *Infant Behav. Dev.*, 2018.
14. T. Field, "Massage therapy research review," *Complementary Therapies in Clinical Practice*. 2016.
15. M. C. Konar, K. Islam, A. Roy, and T. Ghosh, "Effect of Virgin Coconut Oil Application on the Skin of Preterm Newborns: A Randomized Controlled Trial," *J. Trop. Pediatr.*, 2019.
16. H. Baniasadi, S. S. Hosseini, A. Abdollahyar, and H. Sheikhbardsiri, "Effect of massage on behavioural responses of preterm infants in an educational hospital in Iran," *J. Reprod. Infant Psychol.*, 2019.
17. C. C. Yates, A. J. Mitchell, M. Y. Booth, D. K. Williams, L. M. Lowe, and R. W. Hall, "The effects of massage therapy to induce sleep in infants born preterm," *Pediatr. Phys. Ther.*, 2014.
18. S. S.L., H. S., S. H., and M.-M. L.J., "Heart rate variability during caregiving and sleep after massage therapy in preterm infants," *Early Hum. Dev.*, 2013.
19. L. D. Ayuningrum, "H-Hope Plus Kinesthetic With Vco On Weight And Body Length Of Preterm Infants," *J. Ners dan Kebidanan Indones.*, 2019.
20. B. F. Pados and K. McGlothen-Bell, "Benefits of Infant Massage for Infants and Parents in the NICU," *Nurs. Womens. Health*, 2019.
21. Á. M.J., R.-G. D., R. M., L. S., G.-S. J., and F.-G. D., "Effects of Massage Therapy and Kinesitherapy to Develop Hospitalized Preterm Infant's Anthropometry: A Quasi-Experimental Study," *J. Pediatr. Nurs.*, 2019.
22. M. J. Álvarez-Álvarez, D. Fernández-García, J. Gómez-Salgado, B. Ordás, M. D. Rodríguez-González, and S. Martínez-Isasi, "Effectiveness of the application of massage therapy and kinesitherapy by parents on premature neonates: A research protocol," *J. Adv. Nurs.*, 2019.
23. J. Hahn *et al.*, "Neonatal abstinence syndrome: The experience of infant massage," *Creat. Nurs.*, 2016.
24. M. M. Lai *et al.*, "PREMM: Preterm early massage by the mother: Protocol of a randomised controlled trial of massage therapy in very preterm infants," *BMC Pediatr.*, 2016.