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SCOPING REVIEW: APPLICATION OF TACTILE/KINESTHETIC STIMULATION IN PRETERM INFANTS

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ABSTRACT

Background: Premature birth is the birth of a baby born less than 37 weeks gestational age with low birth weight are still a major concern in developing countries Low Birth Weight (LBW). That is puts babies at risk not only for neonatal complications, but also for other high-risk factors such as developmental disorders that can be indicated by the baby's physiological and behavioral responses.
Objective: To assess the effect of tactile/kinesthetic stimulation on weight gain in preterm infants.
Methods: Literature search was conducted from the Google Scholar database. Clinical trials studying tactile stimulation or massage therapy in Indonesia whether or not it is related to kinesthetic stimulation of premature infants; who assessed weight gain after the intervention; which has a control group and is compiled in Indonesian. Search results using these keywords yielded 31 articles. Then filtered articles with inclusion and exclusion criteria obtained 24 articles. Selection of the next article by eliminating duplication of articles with the results of 17 articles. Furthermore, the elimination of articles based on a complete arrangement of as many as 4 articles. Of these, meet the inclusion criteria.
Result: There are many differences in the application of tactile/kinesthetic stimulation techniques to research. Also, many studies do not describe the side effects that occur during stimulation, the actions taken when the event occurs, and their effect on outcomes.
Conclusion: These studies make a relevant contribution to the indications for tactile/kinesthetic stimulation. However, there is no standard for such applications. Future studies should describe the side effects of tactile/kinesthetic stimulation interventions.

Keywords: *stimulation, tactile, kinesthetic*

INTRODUCTION

Premature birth is the birth of a baby born less than 37 weeks gestational age[1]. Premature births accounted for 75% of infant mortality and more than half accounted for long-term deaths[2]. Although most premature babies survive, they are at increased risk of neurodevelopmental disorders, respiratory, and digestive complications[3].

Premature babies with low birth weight are still a major concern in developing countries Low Birth Weight (LBW) are Babies born with a body weight of <2500 grams. LBW puts babies at risk not only for neonatal complications, but also for other high-risk factors such as developmental disorders that can be indicated by the baby's physiological and behavioral responses. Low Birth Weight Babies experience the immateriality of their organs so that LBW is a strong indication of a high risk of mortality, morbidity and disorders of their development [4].

The condition of Low Birth Weight causes the body's organs to not be able to function perfectly, so the adjustment of organ function to changes in conditions from intrautery to environmental conditions outside the uterus is very difficult for babies. The baby in the intrauterine gets warmth, calmness, touch so that the baby can develop properly. In LBW conditions, they must experience intrauterine to extrauterine adaptation early so that it requires a struggle to survive normally. LBW undergoes a large adaptation process related to maturation of the body's organ systems, resulting in a decrease in the physiological development of the baby[5].

The need for care provided not only avoids complications of the disease, but is required to facilitate the needs related to the growth and development of neonates. There are many developmental interventions that can improve the health of neonates, one of which is to provide tactile-kinesthetic stimulation[6].

The mechanism of the effect of infant massage includes the production of beta endorphins that affect the mechanism of growth and development of the baby, the activity of nervus vagus affects the mechanism of food absorption related to the increase in gastrin and insulin enzymes and the production of insulin which can increase the body's resistance. Developmental upbringing provides an easy process of LBW adaptation to the extrauterine environment which includes meeting physiological, social, psychosocial, emotional needs that can facilitate the optimal growth and development of LBW babies. Developmental care Stimulation tactil kinestetic is considered to be able to maintain the baby's physiological response so that it can adapt well. Tactile massage therapy with moderate pressure as an intervention that promotes growth and simultaneously reduces stress because LBW exhibits behavioral responses associated with daily stress inpatient and medical procedures[7].

Developmental care in BBLR babies can be provided through stimulation. Infant stimulation is a developmental intervention in infants by involving an environment that can improve perceptual, sensorimotor, cognitive, language and social emotional development in infants. If the baby's condition is sufficiently advanced (stable condition) developmental interventions can be carried out. Some activities will be individualized according to the instructions, temperament, circumstances, organization of behavior, and special needs of each baby. Short intervention periods and short intervention types are used to tolerate stressful conditions that may appear in infants as a result of the stimulation provided. The type and duration of each stimulation is individually tailored, and parents are

involved as early as possible to learn about their baby's specific developmental needs [8].

Newborn babies are very sensitive to touch, especially on the face, hands, soles of the feet, and abdomen. The provision of kinesthetic tactile stimulation is as a touch so that it can increase its development. Touch and gentle elusion on baby's skin is very beneficial in LBW babies. Tactilekinesthetic stimulation is a term for better and effective massage therapy because it involves light touch (mild caresses on the area of the head to the feet). Kinesthetic tactile stimulation is a complementary intervention in the form of massage therapy with moderate pressure consisting of flexion and extension of the limbs in the supine position, and is an effective intervention in the development of motor behavior of neonates BBLR. Touch can increase the baby's weight, increase the baby's activeness, and can help the baby heal and be discharged from the hospital[9].

Based on this background, the purpose of this study was to assess the effect of tactile / kinesthetic stimulation on weight gain in infants10[10]. The provision of tactile and kinesthetic stimuli in babies born prematurely must be done carefully and expertly so that in the implementation of the administration of stimulation does not aggravate pain and increase the mortality rate. Therefore, this study was conducted using a scoping review to find out the results of the research that has been carried out has benefits in handling in stimulating the breathing of premature babies who experience respiratory failure.

METHODS

The research method used is systematic review with the guideline Prefered Reporting Items for Systematic Reviews (PRISMA). The inclusion criteria of the article used: 1) Articles describing the effects of Kinesthetic Tactile Stimulation on the Development of Low Birth Weight Babies. 2) The published article has a complete section. 3) Published in 2016-2020. The exclusion criteria of the article include: The arrangement of the article is incomplete.

Search Strategy

The search was conducted using the Google Scholar database using keywords: "tactile stimulating", "kinesthetic stimulating", "preterm infat", "respiratory distress syndrome", and :"respiratory failure". Similar words are combined using the "OR" operator while "AND" is used to combine keywords.

The articles that appeared were then sorted so that no articles with the same title were found. Furthermore, the articles are sorted based on predetermined inclusion and exclusion criteria. Articles that list abstracts only will be eliminated. So that the article will be analyzed.

PRISMA Flow Diagram

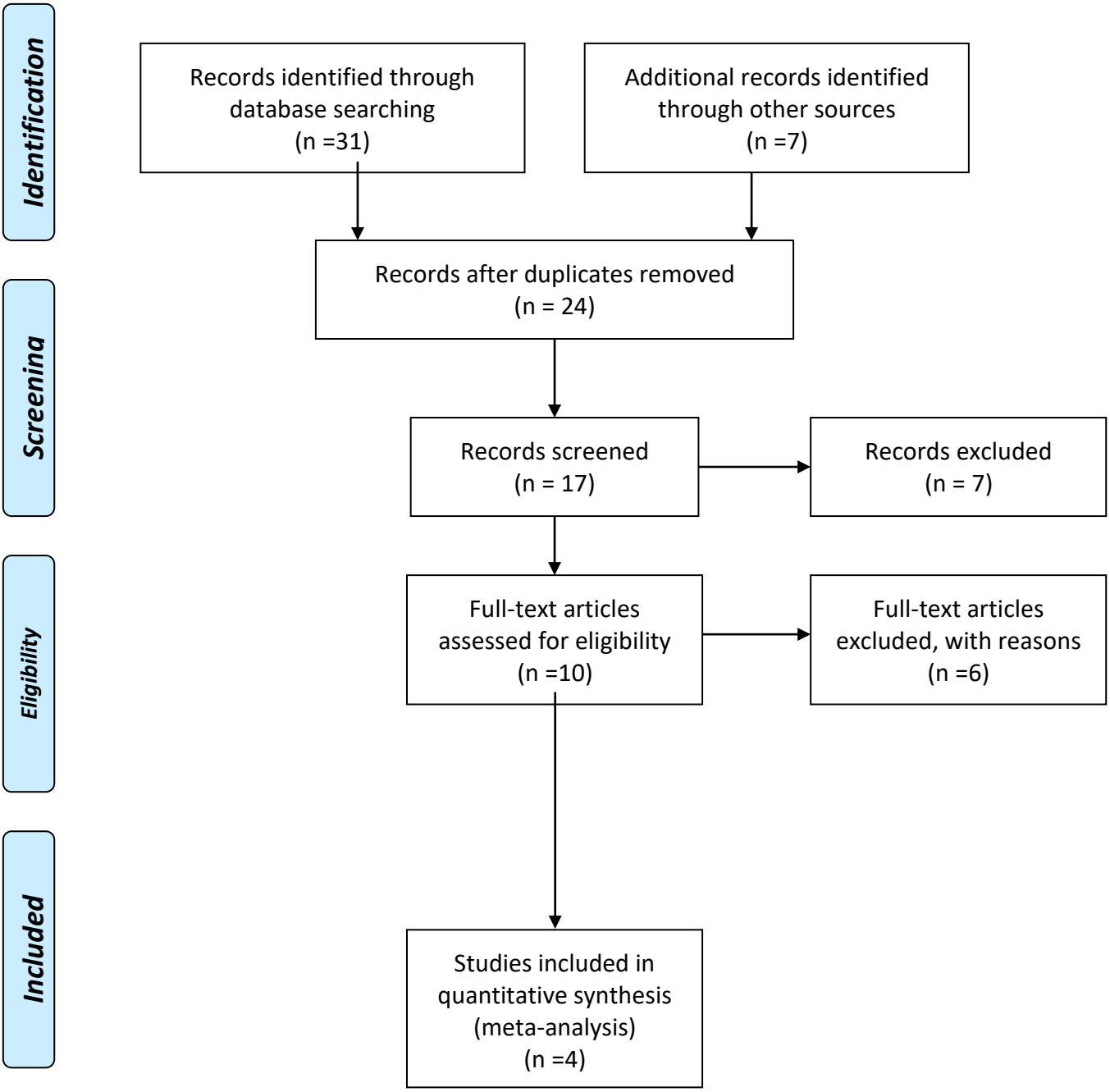

Figure 1 PRISMA Flow Diagram

Article extraction

The articles that have been obtained are then extracted. Article extraction is based on the author of the article, the year the article was published, the number of samples used, the measuring instruments used, the results of the research carried out, and the article database.

RESULTS

Search results using the keyword "Tactile/Kinesthetic Stimulation In Preterm Infants" using the electronic Google Scholar database. Search results using those keywords resulted in 31 articles. Then, article screening with inclusion and exclusion criteria was obtained by 24 articles. The selection of the next article by eliminating the duplication of articles with the result of 17 articles. Furthermore, the elimination of articles was carried out based on a complete arrangement, namely as many as 6 articles.

Tabel 1. Article extraction

Penulis	Tahun	N	Hasil
Dwi Hastuti, Juju Juhaeriah	2016	30 LBW neonatus	There was a significant difference in physiological development of temperature after intervention (Post) in the Intervention and Control Group (p value 0.000); there was a significant difference in Infant Breathing LBW after treatment (Post) in the Intervention and Control Group (p value 0.037); there are significant differences LBW Infant Heart Rate after treatment (Post) in the Intervention and Control Group (p value 0.000); there was no difference in BBLR Infant Weight after treatment (Post) in the Intervention and Control Group (p value 0.155).
Budi Somantri,	2020	25 neonatus prematur	There is a meaningful influence of the administration of tactile-kinesthetic stimulation on the development of premature neonatal behavior
Yusniarita, Yenni Puspita, Wenny Indah Purnama Eka Sari	2021	20 responden	There is an increase in growth and development after kinesthetic tactile stimulation interventions in infants with a history of LBW
Elvi Febria Marnita, Mayetti, Gusti Revilla	2021	39 premature babies. Group intervention of 20 premature babies performed Kinesthetic Tactile Stimulus with a duration of 15 minutes and control groups of 19 premature babies without treatment.	There was an effect of Tactile/Kinesthetic Stimulation treatment on respiratory reduction, decreased heart rate, increased temperature and increased body weight in the intervention group. The untreated control group showed there was an influence of increased temperature and increased body weight. There were no significant differences in the physiological condition of premature babies in the intervention group and the control group.

DISCUSSIONS

The condition of LBW causes the body's organs to not be able to function perfectly, so the adjustment of organ functions to the environment outside the womb is very difficult for babies[11]. With excessive changes in extrauterine conditions can cause stress in LBW. The stress response experienced in infants can be observed, including through physiological changes such as breathing frequency, pulse, temperature changes and the baby's behavioral response. In addition, the stress response will have an impact on the transportation of glucose to the storage area and can cause excessive energy disturbances so that it can cause obstacles in energy conservation that can affect the growth and development of babies. Developmental intervention is one of the nurse's efforts in helping to minimize the baby's stress in adapting intrauterine to extrauterine, so it is hoped that the baby can adapt well. Kinesthetic tactile stimulation has been shown to facilitate the growth and regulation of neonatal behavior, even in very small premature neonates.

Temperature

In the study of Hastuti and Marnita et al, the temperature of the baby before the intervention of the baby experienced hypothermy and after being given the intervention the temperature of the baby was normal. The results showed that the effectiveness of the intervention can help babies adapt to the thermoregulation system. Effective touch therapy can increase the baby's needy temperature through the warmth provided. The kinesthetic tactile stimulation given is a form of subtle touch on the entire baby's body that is responded to by the brain so that it will be responded to and produce better development. newborns are very sensitive to touch, especially on the face, hands, soles of the feet, and abdomen. The provision of kinesthetic tactile stimulation is as a touch so that it can increase its development which is shown, one of which is that the baby feels warm [11].

Respiratory

The results of the study of Hastuti and Marnita, et al showed that the physiological development of infant breathing after treatment (post) in the intervention and control groups showed that there were significant differences in BBLR Infant Breathing after treatment (post) both in the intervention group and the control group. The results of this study showed that tactile-kinesthetic stimulation interventions affected infant breathing where the breathing of infants who were given tactile-kinesthetic stimulation was more stable than infants who were not stimulated, which was seen in the intervention group of average respiration before the intervention[11].

Tactile-kinesthetic stimulation is a developmental treatment that is considered to facilitate physiological stability, one of which is recipiration. Kinesthetic tactile stimulation interventions can improve the motor development of neonatal LBW in relation to improving neuroendocrine response in premature babies, so that the baby avoids stress which has an impact on increasing infant respiration. Rapid breathing in babies will cause excessive energy consumption in addition to having an impact on other physiological conditions that can inhibit the growth and development of the baby. Baby breathing also has an impact on oxygenation circulation for the metabolism of cells and body tissues in achieving growth and development, tactile stimulation and movements carried out in babies can function to launch the circulatory system so that it can increase oxygen supply and help optimize respiratory muscle movements in babies[11].

Heart Rate

The results of the study by Hastuti and Marnita et al showed that the physiological development of the baby's heart rate after treatment (post) in the

Intervention and control group showed that there was a significant difference in the heart rate of LBW babies after treatment (post) in the intervention group against the control group. Tactile-kinesthetic stimulation is a developmental treatment that is considered to facilitate physiological stability, one of which is heart rate. In addition, the touch given can reduce the baby's stress response due to the process of intrauterine adaptation to extrauterine in connection with increasing the neuroendocrine response in BBLR babies which can be shown the baby's heart rate is working more stable. Gentle touch through kinesthetic tactile stimulation has calmed or reduced the effects of stress on premature babies, given that they experience a lot of stress during their hospitalization [11]

Weight

The results of Hastuti and Marnita's study showed that the development of infant weight after treatment (post) in the intervention group and control group showed no difference in Infant Weight (LBW) after treatment (post) in both the intervention group and the control group, kinesthetic tactile stimulation did not affect changes in the weight of BBLR babies, although there was a slight increase in the average intervention group of body weight before stimulation[12]. There are many factors that affect the development of the baby's weight, one of which is nutritional status. In Hastuti's research, most mothers did not give breast milk optimally because the milk came out a little. In Yusniarita's research, et al. there was an increase in body weight and body length before and after kinesthetic tactile stimulation interventions. Massage activities will affect the mechanism of food absorption. In massaged toddlers, there is an increase in the tone of nervus vagus which causes an increase in the levels of the enzymes absorption of gastrin and insulin. Thus, the absorption of food will be better. Massage will increase the activity of the neurotransmitter serotonin, which increases the capacity of receptor cells that function to bind to glucocorticoids (adrenaline, a stress hormone). This process will lead to a decrease in the level of the hormone adrenaline (stress hormone). The decrease in levels of this stress hormone will increase the body's resistance, especially IgM and IgG. Massage and exercise together can increase LBW growth as measured by changes in weight, body length and head circumference. Practically Exercise increases weight, body length and head circumference higher than massage. Both massage and passive motion exercises can promote growth as measured by changes in body weight, body length and head circumference on LBW[13].

Behaviour

The results of Somantri's study found that 25 premature neonates experienced an increase in neonatal growth and increased behavior as seen from the increase in the average value of influence before the administration of tactile-kinesthetic stimulation was 11.0400 and after the administration of tactile-kinesthetic stimulation to 13.3200. The results showed an increase in value of 2.28. In addition, it can also stimulate the oral ability of premature neonates to suck breast milk in more frequency which refers to an increase in neonatal body weight [14].

Behavioral development in preterm neonates will experience disorders that refer to qualitative changes in individuals in terms of communication, thinking processes and the ability to develop social relationships in addition to long-term research in children with a history of premature birth shows there is a greater risk of suffering from chronic diseases; cerebral palsy; impaired motor, visual and auditory developmental as well as behavioral and cognitive developmental disorders, which can affect their academic abilities during school age and adolescence [15].

Stimulation tactil-kinestetic intervention is considered to be able to maintain the baby's physiological response so that it can adapt properly. Tactile massage therapy with moderate pressure as an intervention that promotes growth and simultaneously reduces stress because LBW exhibits behavioral responses associated with daily stress of hospitalization and medical procedures. The stress response in babies will have an impact on physiological development so that it has an impact on the growth and development of newborns. The physiological development of the baby can be seen from changes in temperature, changes in breathing, and heart rate. The growth and development of the baby can be seen in the response to behavior and the increase in the Baby's Weight.

CONCLUSIONS

Stimulation tactil-kinestetic intervention is considered to be able to maintain the baby's physiological response so that it can adapt properly.

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