Massage Therapy in Neonatal Populations: Literature Review

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A literature review serves a significant role in providing valuable data analysis regarding nursing topics utilized in practice. Using research from multiple data sources provides valid and valuable evidence in supporting nursing practice methods (Houser, 2018). A topic worth researching is nonpharmaceutical treatments that can benefit populations (Cheever & Hinkle, 2018). It is a necessity that researchers study the benefits of using nonpharmaceutical treatments in neonates and the potential health benefits these treatments may entail. This paper provides an in-depth analysis of the nonpharmaceutical treatment of massage therapy and its effect on neonatal populations through a quantitative literature review. There will be an exploration regarding the effect massage therapy has on the growth, pain response, and hyperbilirubinemia levels of neonates. This topic is significant because non-invasive treatments need investigating to provide a foundation for nursing practice.

Effect of Tactile/Kinesthetic Massage Therapy on Growth and Body Composition of Preterm Infants

The first article analyzed is the "Effect of tactile/kinesthetic massage therapy on growth and body composition of preterm infants" (Elmoneim et al., 2020). This research aims to explore how kinesthetic massage therapy affects the body of preterm neonates. Researchers have already determined that the growth of lean mass has a better outlook than the growth of fat when it comes to health outcomes for neonates, so they curiously researched whether massage therapy had an effect on body composition and if it promoted lean mass. Researchers randomly selected preterm neonates under the gestational age of 35 weeks. There was a total of 60 neonates who

could partake in this study. The researchers split the neonates into two equal groups of 30. The first group received sessions of massage therapy for five days. The massages lasted fifteen minutes, and healthcare providers implemented massage thirty minutes after the neonate's afternoon feeding. Researchers split the fifteen-minute massage into 5 minutes of tactile massage, which included pressure strokes to the body, 5 minutes of kinesthetic massage, including muscle flexion and extension, and another five minutes of tactile massage. The second group of neonates received routine care without massage. Researchers studied heart rate, oxygen saturation, blood pressure, and respiratory rate during the massage. Researchers also monitored the body composition of the neonates before and after the full five days of massage therapy. Researchers used a scan to measure the density of bones and fat and lean mass ratios of massaged neonates and those who did not receive massages. Researchers determined that the massaged neonates did not show any signs of stress during therapy. Researchers also determined that the neonates who had massage therapy had an increase in weight gain, an increase in length, and compared to the neonates who had routine care, they had increased fat, lean mass, and bone density. Researchers believe that preterm neonates had better lean mass to fat mass distribution overall than neonates who did not receive massage therapy (Elmoneim et al., 2020).

Key Points

The researchers make many critical points during this study. One in which is that massage therapy was associated with weight gain when neonates received massage therapy for five days. Not only did these neonates gain weight cumulatively over the five days, but their weight also increased daily. Cumulatively, neonates who received massages gained 77 grams compared to those who received routine care. These neonates gained 25 grams cumulatively. Daily, massaged

neonates gained approximately 19 grams, while routine care neonates gained just over 3 grams (Elmoneim et al., 2020).

Another point that the researchers make was an association of increased length gain with the massaged neonates. Still, this length was seen in daily length and mid-arm circumference; however, not in thigh circumference, head circumference, or ponderal index gain. The researchers also included important information about the vital data for the neonates receiving massage therapy and those receiving routine care. Neonates receiving therapy had an increased heart rate during implementation; however, the neonates in routine care did not experience increased heart rates (Elmoneim et al., 2020).

Researchers gathered this critical information using a randomized, controlled, single-blind trial. The participants in this trial were patients from the neonatal intensive care unit (NICU) at Mansoura University Children's hospital. The patients included in this study were stable preterm neonates less than 32 weeks gestation. These neonates did not need supplemental oxygen and were not suffering from cardiac issues or known infections. Researchers also noted that these neonates were receiving sufficient breast milk or formula. Researchers gauged facial expressions, crying, and signs of distress to monitor the neonates' behavior to collect the data. Researchers also monitored vitals to measure heart rate, oxygen saturation, respiration, and blood pressure and took vitals before the massage, during the massage, and after the massage. Researchers used a densitometer to measure bone density, body fat, and lean mass. The researchers used software to aid Kolmogorov-Smirnov testing for statistical analysis. Researchers also used Mann-Whitney U and Chi-square tests to learn more about the variable data (Elmoneim et al., 2020).

Research determined no observable physiological or behavioral stress during massage therapy when observing the facial and observable expressions. Researchers also determined that the software data showed an increase in weight gain and growth. These variables received a p-value of 0.01, which is significant. The body composition analysis showed that massage therapy increased body composition changes compared with the neonates receiving routine care. Researchers discovered that neonates who received therapy had a higher heart rate while receiving treatment for vitals. The p-value was at 0.004, which is significant. After receiving the data, researchers concluded that massage therapy is associated with increased fat mass, lean mass, tissue mass and had overall benefits in body composition. This massage therapy improved the growth of neonates and aided in healthy bone growth and bone density (Elmoneim et al., 2020).

Assumptions

This research article provides the assumption that massage therapy in preterm neonates provides better health outcomes compared to preterm neonates who did not receive massage. The author explains known data that massage therapy leads to faster weight gain, independent oral feedings, less pain response, fewer infections, and overall, a shorter hospital stays due to the health benefits. Because of this information, the reader assumes that massage therapy would have a beneficial outcome in neonates' growth and body composition. The researchers also explain that neonates experience tactile stimulation in the womb similar to the strokes received during the massage therapy. This information provides the assumption that tactile massage therapy provides the neonate with the stimulation they cannot receive due to being born prematurely. This information suggests that providing a stimulation given in typical development

will most likely have a more beneficial outcome than those neonates who did not receive the necessary stimulation (Elmoneim et al., 2020).

Deficit/Conclusion

The researchers provide an acceptable and logical line of reasoning. The researchers used discovered data relating to massage therapy practice in neonatal populations and decided to test whether the perceived benefits of massage would benefit body growth and composition. Previous data suggests that neonates receiving massage therapy have decreased stress, pain responses, infections, and need for medical treatment. Because of the previous data, it is logical to assume that massage therapy would benefit the overall body fat to lean mass ratios. The researchers developed interventions to obtain evidence to prove the benefits of massage therapy on body composition. After implementing massage therapy on premature neonates, researchers collected data and compared that data to the premature neonates who did not receive massage therapy and concluded that massage therapy had benefits related to body growth and composition (Elmoneim et al., 2020).

This article implies that providing massage therapy is an uncomplicated, non-invasive treatment that benefits the patient. This intervention helps the patient, and the research gathered in this study suggests that massage therapy for neonates should be standard nursing practice. Based on the data collected, if the nursing practice does not include massage therapy for preterm neonates, the neonates would not be provided the much-needed stimulation. This lack in practice can inhibit massage therapy's benefits, such as increased growth, fat mass, and lean muscle mass. It can also inhibit improved growth parameters and the benefits discovered in past research, such

as increased weight gain, less stress, faster independence in feedings, and lower infection rates (Elmoneim et al., 2020).

Effects of Massage Therapy on Indirect Hyperbilirubinemia in Newborns who Receive Phototherapy

The second article analyzed is "Effects of massage therapy on indirect hyperbilirubinemia in newborns who receive phototherapy" (Korkmaz & Esenay, 2020). A neonate's chance of excessive bilirubin levels may increase when suffering from lack of nourishment, prematurity, or a glucose deficiency. Globally, 80% of preterm neonates have hyperbilirubinemia within the first week of their life. Neonates with elevated bilirubin can develop encephalopathy, which can cause severe muscle spasms, respiratory distress, and lethargy. In order to decrease hyperbilirubinemia in neonates, the standard practice is phototherapy. However, newborns can experience adverse effects such as skin burns, dehydration, and loose stools. Due to this information, researchers aimed to find a method to reduce high bilirubin levels in neonates that minimizes adverse effects and is cost-effective. The purpose of this study is to discover how massage therapy affects hyperbilirubinemia in neonates. To determine if massage therapy reduces bilirubin levels for neonates, researchers conducted a controlled trial that included newborns born between the ages of 37 and 42 weeks with a birth weight of at least 2500 grams. The neonates needed an Apgar score between 7-10 for consideration. They also needed to diagnose hyperbilirubinemia at a minimum of 24 hours after birth. Researchers decided to exclude newborns who had an infection, blood transfusions, or Rh incompatibility from the study. After researchers set the criteria, 50 neonates fit the inclusion criteria and could participate (Korkmaz & Esenay, 2020).

Researchers split the newborns into 25 who were to receive the massages and 25 who would not receive the massages. Both groups of neonates still received phototherapy. Neonates in the intervention group received massages twice a day for 15 minutes. These massages were conducted 30 minutes after the morning and evening feedings. The neonates did not receive phototherapy during the massages. The results determined that the bilirubin levels of the neonates who did receive massages were significantly less than the neonates who did not receive massages. The intervention group's bilirubin levels were at approximately 9 mg/dl, and the control group had a higher bilirubin level at approximately 11 mg/dl (Korkmaz & Esenay, 2020).

Key Points

The researchers bring up numerous critical points concerning their research. The researchers used quantitative methods and a randomized control trial to obtain data. The participants in this study were newborns who had hyperbilirubinemia, and the study took place in two different hospitals. The first hospital was Ankara University Cebeci Research and Training Hospital, and the second hospital was May State Hospital, located in Ankara. Both of these hospitals preside in the country of Turkey. Researchers completed a form that included the patent's Apgar scores, feeding, bilirubin levels, frequencies of urination, feedings, and defecation frequencies. One point is that the researchers noticed significant differences in how often the neonates in the control group and intervention group defecated and urinated. The researchers discovered that the neonates in the intervention group defecated 60% more than the neonates in the control group, and the p-value was at .001, which shows significance. There were similar results when it came to how often the neonates urinated. Neonates in the intervention group urinated approximately 29% more than the neonates in the control group. The p-value was also at .001 and is significant.

This information is a crucial finding because the information suggests that massage therapy increases the rate at which the neonates defecate and urinate, which increases the excretion of bilirubin from the body. Researchers believe that massage therapy increases peristalsis and increases defecation frequency in neonates. The intervention group had a mean frequency of urination greater than those in the control group when it came to urination. Researchers believe this is due to massage therapy stimulating the kidneys and increasing blood circulation. This stimulation causes urobilin excretion, which is how bilirubin exits the body through urination (Korkmaz & Esenay, 2020).

Another critical point the researchers make is that there were significant differences in the feedings between the intervention and control groups. The intervention group had a significantly higher feeding rate, especially the breastfed neonates, than those in the control group. Breastfed neonates in the intervention group ate approximately ten times in 24 hours, and breastfed neonates in the control group ate approximately seven times per day. Researchers noticed that neonates who had the massage therapy increased the activity of the newborn, which increased their willingness to feed. Researchers determined that massage therapy also stimulated the vagus nerve, which increases digestive motility and gastric emptying. The increase in willingness resulted in more frequent feedings, which increased urination and defecation, increasing bilirubin excretion. The p-value was at .001, which is significant in the researchers' findings (Korkmaz & Esenay, 2020).

The researchers concluded that massage therapy on newborns treated with phototherapy could significantly reduce bilirubin levels. The use of massage therapy increases urination, defecation, and feedings, increasing the elimination of bilirubin from the body. The use of

massage therapy is also an effective supplemental intervention that can be used alongside phototherapy to successfully lower total serum bilirubin in blood levels. Massage therapy can help prevent life-threatening health issues such as encephalopathy and should be utilized (Korkmaz & Esenay, 2020).

Assumptions

This article provides the assumption that massage therapy in full-term neonates provides a benefit to those with hyperbilirubinemia by causing a higher excretion rate of bilirubin. The researchers provide information about how bilirubin is excreted from the body by defecation and urination. There is an assumption that to rid the body of bilirubin finding methods that increase the defecation and urination of the neonate, such as feeding, would increase bilirubin excretion. Phototherapy causes side effects that do not promote an increase in feedings. The researchers include information regarding the side effects of phototherapy. These side effects include diarrhea, dehydration, and hyperthermia, which do not stimulate feeding based on the control group feeding amounts. This data provides the assumption that phototherapy as a stand-alone treatment does not provide the best method to reduce bilirubin levels and that massage therapy stimulates neonatal feedings. This increase in feedings is due to massage therapy which helps reduce bilirubin levels by increasing defecation and urination (Korkmaz & Esenay, 2020).

Deficit/Conclusion

The researchers' line of thinking is acceptable. Hyperbilirubinemia is a common but potentially dangerous condition. Excess bilirubin levels can potentially cause encephalopathy, respiratory distress, and lethargy. Researchers wanted to study how massage therapy affected

bilirubin levels and discovered that massaged neonates had lower bilirubin levels. This decrease in bilirubin is primarily due to the increase in feedings, defecation, and urination of the neonates stimulated with massage therapy. The implication is that massage therapy is a non-invasive and simple method to reduce hyperbilirubinemia levels that have no adverse effects. Another implication is that massage therapy should not be used as a stand-alone to reduce bilirubin levels and accompany phototherapy. Neonates with hyperbilirubinemia still need to be treated with the standard practice of phototherapy. Based on the research conducted, if nursing fails to accept this line of reasoning, neonates can experience more adverse effects to reduce hyperbilirubinemia. The addition of massage therapy aids the excretion of bilirubin at a quicker rate than treatment with just phototherapy. Since massage therapy helps treat high bilirubin levels more rapidly, not implementing massage therapy indicates more treatments with phototherapy. More treatments with phototherapy can cause a patient to experience adverse effects for a more extended time and potentially cause more harm (Korkmaz & Esenay, 2020).

The Effects of Massage and Breastfeeding on Response to Venipuncture Pain Among Hospitalized Neonates

The third article reviewed is "The effects of massage and breastfeeding on response to venipuncture pain amount hospitalized neonates" (Zargham-Boroujeni et al., 2017). This article explains that pain is a sensation that affects everyone from when they are born to when they die. Pain is considered a worldwide health problem. There was a belief that neonates could not feel pain in the past. However, more recently, it has been discovered that neonates feel more pain than adults. There are issues that neonates face when dealing with unmanaged pain. There are long- and short-term complications that result from pain, such as increased heart rate, sleep cycle

changes, hypoglycemia, increased cortisol levels, awareness of procedures resulting in pain, growth and development changes, and disturbances in social behaviors. Managing pain in neonates can prevent psychological and mental complications in the subsequent phases of development. Many procedures are often painful in Neonatal Intensive Care Units (NICU). There are pain relief methods available that are both pharmaceutical and nonpharmaceutical. Nonpharmaceutical methods can be independently used by nurses when administering pain relief. Massage therapy is one nonpharmaceutical method that can relieve pain from venipuncture. Massage therapy lowers the stress levels of the neonate and improves circulation. Massage aids in improving venous return to the heart and improves lactic acid from being removed from the muscles. Massage also stimulates endorphin release, which acts as a natural pain reliever. Massage therapy has no complications and is a pain relief method used on neonates who cannot consume nutrients orally. The researchers' primary purpose of this study is to determine if implementing massage therapy acts as a pain reliever from venipuncture pain and how it compares to breastfeeding as a pain reliever (Zargham-Boroujeni et al., 2017).

Researchers had three groups of neonates separated between neonates receiving breastfeeding as a pain reliever, neonates receiving massage therapy as a pain reliever, and neonates who did not receive massage therapy or breastfeeding as a pain reliever. The neonates in the breastfeeding group breastfed for 3 minutes, and then there was venipuncture administration. For the massaged neonates, a healthcare worker massaged the neonates at the venipuncture site for three minutes. After the massage, the healthcare provided administered venipuncture. Researchers filmed all stages of the venipuncture for each group, and a person unaware of which neonate belonged to which group scored the neonates based on their pain levels. Pain levels were

determined based on the neonate crying, flexion and extension movements, and facial muscle contractions (Zargham-Boroujeni et al., 2017).

Key Points

One key point is that a typical treatment for venipuncture pain relief is the implementation of sucrose; however, there are many adverse effects such as nausea, bloat, and vomiting. This information led researchers to study the effects of a lower cost, complication-free and easily applied method that nurses can quickly implement. Researchers looked at previous research relating to massages and venipuncture. Researchers determined that neonates born between 33 and 40 weeks gestational had a positive growth and heart rate development. Hence, they wanted to see if there were any benefits to using massage therapy for pain relief. Researchers determined that massage therapy lowers pain response compared to the control group without pain relief interventions. Unlike sucrose methods, there were no adverse effects associated with massage therapy (Zargham-Boroujeni et al., 2017).

Another critical point is that massage therapy increases serotonin levels, which like endorphins, are a natural pain reliever created by the body. The mean score of pain response in neonates decreased in the massage group compared to the breastfeeding and control group. This data suggests that massaging the neonates before a procedure like venipuncture reduces pain in the neonates. Researchers also noted differences in individual neonates, which could relate to familial and psychological responses that could affect the pain assessment during the study. This information was considered something that could potentially influence the results (Zargham-Boroujeni et al., 2017).

Researchers gathered this vital information by conducting a double-blind clinical trial. The researchers conducted the study in the NICU at hospitals associated with Isfahan University in Iran. The inclusion criteria for the neonates included neonates born after 34 weeks gestation with no paralysis, down syndrome, or asphyxiation. It was also crucial that neonates were relaxed and not crying before the venipuncture administration during this study. The data collection included a questionnaire containing questions about the neonates' characteristics, height, and weight. Researchers also used the Neonatal Infant Pain Scale (NIPS) to assess the pain intensity the neonates experienced. There were 75 neonates assigned to either the massage group, the breastfeeding group, or the control group. Researchers split the neonates into 14 females and 11 males in the breastfeeding group, 16 female neonates and 9 male neonates in the massage group, 13 female neonates, and 12 male neonates in the control group. The results indicated that mean pain scores were 0.92 for the massage group, 4.84 for the breastfeeding group, and 6.16 for the control group. The results show that neonates in the massage group had lower pain levels than the control and breastfeeding groups. This data showed pain score decreased and had a p-value of 0.01, which is significant. The researchers concluded that massage therapy assists in relieving pain during painful procedures for neonates. Both the breastfeeding and massage groups had results signifying decreased pain which is ideal because they are helpful, natural, and low-cost interventions that do not require specialists to administer (Zargham-Boroujeni et al., 2017).

Assumptions

This article provides the assumption that massage therapy is an effective pain reliever for neonates who are undergoing potentially painful procedures such as venipunctures. This assumption relates to the belief of the gate control theory, which has to do with how the brain

interprets pain receptors. Based on the gate control theory, less myelinated and shorter nerve fibers result in more pain stimulation. Pressure impulse transmission is more likely with myelinated and longer nerve fibers and reaches the brain sooner than the pain impulses. Based on this known knowledge, there is an assumption that the brain receives massage impulses sooner than pain impulses, and the gate control is closed during a massage. The closed gate control means pain messages are not as quickly transmitted, and therefore the neonate feels less pain (Zargham-Boroujeni et al., 2017).

Deficit/Conclusion

When discussing the effectiveness of massage to reduce pain in neonates, the author's reasoning is acceptable. However, there is some doubt whether massage therapy was a more effective method than breastfeeding. Researchers noted that the breastfeeding group did not score as favorably to reduce pain in neonates during venipuncture compared to previous studies. Researchers believed this was because breastfeeding was stopped before venipuncture and did not continue. Researchers believed that if breastfeeding were to continue throughout the entire procedure, there would have been a higher decrease in pain levels (Zargham-Boroujeni et al., 2017).

Nevertheless, there is an implication that massage therapy provides an effective method of pain control in neonates. After massaging the venipuncture site for three minutes prior to administration, neonates showed fewer behavior responses, less crying, less flexion and extension of their body during the painful procedure, and more minor contractions of facial muscles. Massage therapy is cost-effective and easily implemented. This method can easily be administered prior to painful procedures in nursing practice. If nursing does not accept this line

of reasoning, neonates can potentially suffer from complications. Unmanaged pain can cause an increase in blood pressure, increased heart rate, increased awareness regarding painful procedures, increased cortisol levels, and physiological changes. Nurses must provide pain-reducing implementations, such as massage therapy, to prevent these short- and long-term complications affecting the neonatal population (Zargham-Boroujeni et al., 2017).

Conclusion

When analyzing the articles related to massage therapy and its benefits, all three articles offer substantial evidence that massage therapy is beneficial and implementation during nursing practice is essential. Massage therapy improves neonates' growth and body composition and improves weight gain and length gain, which provides a better health outcome. This improved health outcome is due to the faster weight gain, improved independent oral feedings, and decreased pain response. This improvement in growth can reduce hospital stays, decreasing the likelihood of developing a nosocomial infection. It also decreases the chance of needing an invasive medical procedure that can cause potential health damage (Elmoneim et al., 2020).

Massage therapy also has benefits to neonates with hyperbilirubinemia. Massaged neonates had more interest in feeding, which increased defecation and urination. Neonates who were massaged defecated 60% more and urinated 29% more than the neonates in the control group. The increase in defecation and urination aids the excretion of bilirubin from the body. This excretion of bilirubin decreases the likelihood of developing encephalitis (Korkmaz & Esenay, 2020). Massage therapy also aids in pain relief for procedures such as venipuncture. This pain relief prior to administration of painful procedures can reduce distress, anxieties, and pain responses in neonates and increase serotonin levels. Massage therapy provides pain relief that is

low cost and free from adverse effects. Less adverse effects decrease the likelihood of treating those adverse effects with potentially harmful medications or procedures (Zargham-Boroujeni et al., 2017).

Massage therapy improves the health outcomes of neonatal patients. Massage therapy is a treatment method that produces no adverse effects, is cost-effective, and is easy to implement. Health issues such as hyperbilirubinemia can cause severe health problems in neonatal populations. Hyperbilirubinemia can result in hypoglycemia, bilirubin encephalopathy, and decreased feedings. When a neonate has a high bilirubin level, it is a priority to treat the neonate and reduce the bilirubin level. The standard treatment is phototherapy which can cause adverse effects. These adverse effects include hyperthermia, skin burns, dehydration, and diarrhea. Based on the research provided, massage therapy added to phototherapy treatments can increase the excretion of bilirubin. This increase in bilirubin excretion decreases the need for prolonged phototherapy treatments (Korkmaz & Esenay, 2020). Massage therapy also improves health outcomes by promoting weight gain in neonates. Weight gain, especially in lean mass, improves health in the long term, especially for preterm neonates. Massage therapy provides the neonate with the stimulation they would receive in the womb. This stimulation increases weight gain, results in less stress and improves the neurodevelopmental outcome (Elmoneim et al., 2020). Massage therapy also improves neonatal health outcomes by preventing unmanaged pain and decreasing the likelihood of the long-term effects of increased stress and cortisol levels. Massage therapy also helps reduce future anxieties associated with painful procedures (Zargham-Boroujeni et al., 2017).

The information in these articles can significantly improve nursing practice. As stated previously, massage therapy is easily implemented, cost-effective, and benefits the neonatal population. Nurses can easily incorporate massage therapy into their patient's plan of care to improve their overall health with no adverse effects. A neonate treated by a nurse with massage therapy resulting in improved health outcomes will likely have shorter hospital stays, allowing for a decreased chance of acquiring nosocomial infections (Elmoneim et al., 2020). By having less chance of hospital-acquired illnesses, there is an improvement of quality care to the neonate. A decrease in infection rate improves the care of the neonate, but a shorter hospital stay allows the nurse to work with patients who are more in need and lowers the patient-to-staff ratio. An earlier discharge is also cost-effective for the patients because they will not have to pay the costs associated with a prolonged hospital stay. When it comes to healthcare, massage therapy implementation should be encouraged. Massage therapy is a way to reduce stress which can improve patients of all ages. It is essential for healthcare professionals to use research in their practice and stay current in modernized interventions. Following up-to-date intervention methods allows patient populations to receive effective quality care. Neonatal nurses must research how to better care for neonatal populations, especially when it comes to nonpharmaceutical treatments like massage therapy, to ensure that their patients receive quality care that gives them the best chances for a quality life (Cheever & Hinkle, 2018).

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