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Enhancing Breast Milk Production Through The Effectiveness of Music Therapy: (A Study in terms of Frequency, Type, and Duration of Music)

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ABSTRACT

Background: Music therapy is one of the non-pharmacological treatment methods used to increase milk production. Music stimulates the release of the hormone oxytocin and endorphins to increase milk production. Music's frequency, type, and duration are pivotal in music therapy instead of music intervention.
Purpose: to enhance breast milk production through the effectiveness of music therapy in terms of frequency, type, and duration of music.
Method: The PICO (Population, Intervention, Comparison, and Outcome) framework is used as the basis for formulating the research questions. Besides, the EBSCO, Wiley, PubMed, and Google Scholar databases are also used as the literature study. PRISMA Flowchart and critical appraisal are implemented in selecting the article.
Results: the synthesis contained five articles that met the inclusion criteria. This Review found that music therapy may be a method that can be used to increase relaxation and milk production.
Conclusion: The effectiveness of music therapy is maximum if the mother plays their favorite music. The best music type for this therapy is passive music, which provides a relaxed sensation through the lyrics and harmony, such as the bonding between the mother and her child.

Keywords: *Breast milk, Health Technology Assessment, Increased Production of Breast Milk, Music Therapy, Non-Pharmacological Therapy*

INTRODUCTION

Breast milk is a unique biological fluid that contains nutrients and bioactive components [1] with various short and long-term benefits for babies and mothers[2]. Breastfeeding reduces the risk of ovarian and breast cancer in mothers, causes morbidity and mortality in infants, and results in lower health costs and lower socioeconomic inequality. WHO and UNICEF recommend that babies be exclusively breastfed for the first six months of life and continue to be breastfed with adequate and safe complementary foods for up to 24 months to reduce under-five mortality. The American Academy of Pediatrics also recommends exclusive breastfeeding for the first six months of life[3].

Globally, exclusive breastfeeding is done by 62.6% while breastfeeding is 83.2%. Some so many mothers cannot breastfeed their children exclusively, although they want to. Supporting breastfeeding exclusively should be given continuously since the data shows that exclusive breastfeeding decreases monthly[4]. Milk production can be affected by difficulties in labor and the puerperium. Prolonged pregnancy stress can lead to severe postpartum mental illness[2]. Mother and baby will experience a complicated transition from the first weeks of pregnancy to the early postpartum period. Adapting to the loss of placental hormones, breastfeeding, and coping with the stress of baby care are the main challenges for mothers. Challenges during this transition can manifest as postpartum depression and can affect the level of milk production[5].

Although 70% of mother continuously breastfeed their children for one year, the rate will decrease to 45% in the second year[6]. Milk production can be increased by using pharmacological and non-pharmacological methods, such as frequent breastfeeding, massage, and compression, applying moist heat, acupuncture, and acupressure, information, and training, hypno-breastfeeding, yoga and relaxation techniques, aromatherapy, kangaroo care, herbal teas, galactagogues, and music therapy[7]. Music therapy is one of the non-pharmacological treatment methods used to increase milk production[5]. Music stimulates the release of oxytocin and endorphins, helping increase milk production[8].

Music therapy has shown positive results and has been used in various fields, such as mental health, special education, rehabilitation, pain management, stress, burnout, and social development[9,7]. Several studies have shown that music therapy can reduce anxiety to help mothers deal with newborn hospitalization in the neonatal intensive care unit (NICU). It also affects the behavior of premature babies, providing longer sleep time, calm, less crying, and increased weight, but no studies discuss the effect of music therapy on breastfeeding rates[7]. A previous study conducted by Costarino in 2015 reported that the amount and volume of breast milk of mothers with premature babies in the NICU who listened to music increased significantly for one week. Likewise, in a study where music therapy was applied to mothers with premature babies in the NICU, salivary cortisol levels were lower, and the amount of breast milk was higher during the music sessions. In addition, milk production increased significantly after the music session on the last day. These results support the finding of a significant increase in milk produced after the third day of the study[7].

The Proceedings of the Association of Women's Health, Obstetric, and Neonatal Nurses (AWHONN) 2020 Convention states that research has been conducted using a Likert scale survey. The result showed that the breastfeeding women reported feeling significantly more relaxed after breastfeeding[10]. According to[5], the intervention of giving music

enhanced milk production. They say that choosing a form of music according to the mother's preference can also be more effective in increasing milk production. In addition, when providing music therapy, some points should be considered. It was not only the music intervention; music's frequency, type, and duration in increasing breast milk production need to be considered[5].

This is a review article to assess the clinical effectiveness and economic evaluation of health technology in the current context of Health Technology Assessment, which refers to systematic evaluation covering safety, efficacy, effectiveness, social and economic aspects of the characteristics and impact of distribution and use of health technology.

METHODS

The method used in this analysis was an integrative review method. The topic in this study was determined through a review of previous research articles regarding the effectiveness of music therapy in increasing breast milk production. Based on the PICO framework, the research question would be, "Can music therapy be effective in breastfeeding mothers enhancing milk production in terms of the frequency, type, and duration of music?"

The literature search strategy in this study used several databases, including EBSCO, Wiley, and PubMed. Google Scholar is used to find information or reports in printed form that are not published but are still original, objective, and up-to-date. The keywords used in searching for articles in the database are "Music Therapy AND Breastfeeding ."The inclusion criteria in the search for articles were articles that discussed music therapy to increase breast milk production by providing musical interventions based on the frequency, type, and duration of music in the study population, the latest articles in 2015-2021, and the English language. After getting the article as evidence for this research review, we conducted a Critical Appraisal using Assessment tools from The Joanna Briggs Institute (JBI) to assess the articles' quality.

Table 1. *The Research Question*

P	Breastfeeding mothers (Babies aged 0-24 Months)
I	Music therapy is based on the music's frequency, type, and duration.
C	-
O	Increased milk production

RESULT

Three databases were used in the article selection: EBSCO 9 articles, Wiley 289 articles, Pubmed 15 articles, and some other literature from Google Scholar around 1000 articles. Researchers screened articles; 1,303 articles irrelevant to the research topic were excluded, and 2 double or duplicate articles were detected and excluded. After the screening stage, the researcher carried out the eligibility or article feasibility selection stage to find articles that matched the inclusion criteria. Articles were excluded if they did not match or the article entered the exclusion criteria set by the researcher. Based on the synthesis results, five articles that met the research criteria were obtained. Then, an assessment was carried out on the articles (critical appraisal) to assess the quality of the articles used as evidence base so that the credibility of the articles used was high and the results could be trusted.

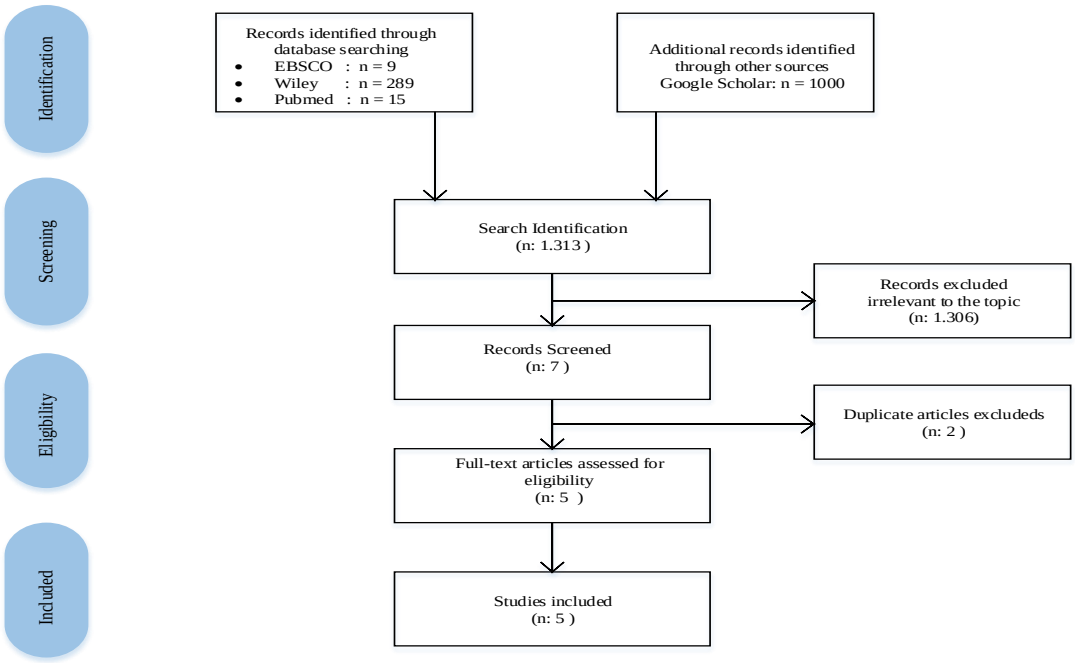

Figure 1. PRISMA Flowchart

DISCUSSION

Breastfeeding is a physiological process; a history of complications during labor and childbirth and anxiety experienced by the mother can affect milk production. Pharmacological and non-pharmacological methods were used to increase milk production[11]. Music intervention was used as a non-pharmacological method used to increase milk production. The lyrical meaning of music could be significant for its relaxing effect, which could encourage bonding between mother and baby. Music positively affects lactation and breast milk expression, thereby triggering an increase in milk production[11]. In his research, Jayamala, 2015) stated that music therapy positively reduces stress on the mother, so it could increase the amount of breast milk[8]. There was a significant increase in milk production among mothers who were given music therapy compared to mothers who were not [7]. According to Keith *et al.*, 2012 in their intervention, breastfeeding mothers who listened to music also produced milk with a much higher fat content during the first six days of the study. Listening to music by full-term mothers immediately after delivery significantly increased the amount of breast milk[11]. A systematic review and meta-analysis found four research trials that reported that music interventions could increase milk production. Music had a calming effect, reducing stress and anxiety; this encouraged the release of more of the hormones oxytocin and prolactin, which could increase milk production [5].

When applied scientifically, music has been shown to alleviate human suffering. Music helps physical, emotional, and spiritual health in humans. In his research, Jayamala, 2015 conducted with stressed mothers with 30 premature babies, the experimental group was given four sessions of 30-minute music therapy for six months; it was reported that mothers in the experimental group had higher milk production and a significant reduction in stress levels[8].

Table 2. Article Extraction

No	Title/Author/ Year/Code	Country	Objective	Type of Research	Data Collection	Music Frequency	Music Duration	Music Type	Participants/ Sample size	Results
1.	Impact of Music Therapy on Breast Milk Secretion in Mothers of Premature Newborns/Ak, et al/ 2015/A1	India	Evaluation of the impact of music therapy on the amount of mother's milk secretion from premature newborns by reducing maternal stress.	Experimental	Primary/Questionnaire self-evaluation of PSS and music-giving intervention	Two times a day for four days	30 minutes	Active (flute)	30 mothers with premature babies (pregnancy less than 34 weeks) who required NICU hospitalization	Music therapy is associated with a significant reduction in stress levels, as indicated by an increase in PSS scores and a decrease in salivary cortisol. Subjects who received music therapy experienced a considerable increase (p-value-0.33) in milk expression compared to mothers who did not.
2.	Effect of Music on Immediately Postpartum Lactation By Term Mothers After Giving Birth/ Kittithanesuan et al. 2017/A2	Thailand	The effect of listening to music on the response of lactation in the postpartum period immediately after vaginal delivery with term pregnancies.	Randomized Controlled Clinical Trial	Primary/intervention: giving music and without music immediately 1 hour after delivery and two hours after delivery/after breastfeeding the baby	-	11 minutes	Passive (Traditional music with lyrics depicting a mother's love for her child)	304 women gave birth typically at term gestational age (postpartum)	Breastfeeding mothers who listened to music immediately after delivery showed a significant increase in lactation after breastfeeding compared to the control group with increased lactation after breastfeeding ($p<0.05$)
3.	The effectiveness of interventions using relaxation therapy to improve breastfeeding outcomes: A Systematics Review/ Mohd Shukri, et al. 2017/A3	Malaysia	direct effect of relaxation therapy on breastfeeding outcomes (volume and composition).	Systematic Review of randomized controlled trials	Secondary/ Literature review	-	-	-	Mother of mixed parity. The five trials (5 articles) sample was 311 healthy or premature mothers.	Relaxation therapy has been proven to increase milk production but cannot be generalized to all breastfeeding mothers based on social and economic class.
4.	The effects of music intervention on breast milk production in breastfeeding mothers: A systematic review and meta-analysis of randomized controlled trials/Mustafa Volkan Düzgün dan Zeynep Özer/2020/A4	Türkiye	the effect of music intervention on milk production in lactating mothers.	Systematic Review and meta-analysis of randomized controlled trials	Secondary/ Literature review	Ten times a day	30 minutes	Active music or music of your choice	A total sample of five trials (5 articles), 554 participants	Cochran's Q test results show that music has a negligible effect on increasing milk production (Hedge's g = 0.39). A systematic review and meta-analysis of these five trials indicated that music can effectively increase milk production. The types of music recommended are passive and active, both of which have the same effect, but the kind of music chosen by the participants is more effective in increasing milk production.

5.	The Effects of Listening to Music on Breast Milk Production by Mothers of Premature Newborns in the Neonatal Intensive Care Unit: A Randomized Controlled Study/Varisx og˘ lu, Yeliz, et al/2020/A5	Türkiye	the effect of listening to music on milk production in Turkish mothers with premature newborns.	Randomized Controlled Clinical Trial	Primary/intervention: giving music and no music	Two times a day for four days	15 minutes	Passive (Breast feeding music from Turkey)	The study population was 44 mothers (22 in the music group and 22 in the control group) with premature infants born between 28 and 34 weeks in the NICU.	MG's status and total anxiety scores were statistically low ($p<0.05$). There was no difference between the MG and control groups in the amount of milk the breasts produced; however, the post-test cortisol level of the MG group was significantly lower than that of the pretest measurement ($p<0.05$). Listening to music in the NICU while breastfeeding can help reduce stress levels in premature newborn mothers and support milk production.

Listening to music could stimulate alpha waves in the brain that cause relaxation by increasing endothelial function, dilating blood vessels, and releasing nitric oxide and endorphins. By listening to music, the mother's heart rate also becomes balanced, which decreases depression, anxiety, and stress and provides attachment between mother and baby[7]. Music therapy promotes relaxation and reduces breastfeeding anxiety and could, therefore, enhance the milk ejection reflex[10].

Mothers were advised to listen to therapy once a day [11,2], with use varying from 4 days to 8 weeks a day[2] or twice a day for four times a week[8]. Mothers listened to music therapy while expressing breast milk in the morning or evening[8,2].

Types of music were divided into two, namely, passive and active. Passive music if someone is only limited to listening to the strains of music. The type of music in the intervention of providing music therapy used was flute music played in silence in the surrounding environment, music in local languages, relaxing music videos using photos of babies, and a combination of active and passive music with mothers breastfeeding their babies while singing accompanied by a therapist playing music[8,5,11,2]. From the music therapy field perspective, the mother's favorite music was generally considered a better choice than the music prescribed by the therapist[9].

The duration of the music intervention in several studies ranged from 11 to 60 minutes[5]. In the first 15 minutes, the mother listened to music through the iPod, and then in the last 15 minutes, the mother pumped milk while listening to the music being played[8]. The duration of the music was about 11 minutes[11], 12 minutes to 20 minutes[2] and for 15 minutes[7].

This music therapy does not require expensive costs; it is non-invasive, harmless, and inexpensive[5,11,2,7].

Limited research results and evidence on the effectiveness of music therapy for increasing milk production have been published in the last five years; for future researchers, it was hoped that they could conduct clinical trial research on the effectiveness of music therapy on increasing breast milk production by applying the frequency, type, and duration of the music.

CONCLUSION

Music therapy is pivotal to improving mothers' relaxation and milk production. Music therapy will be more effective if the music played is the mother's favorite. The music that provides a relaxing effect is passive music, with meanings and lyrics that have meaning, like the bond between mother and child. The duration of the music needed also varies. Still, it is recommended to listen to music 15 minutes before breastfeeding or

expressing breast milk to stimulate the hormones oxytocin and prolactin so that when breastfeeding, breast milk productivity is abundant. This music therapy can be done 1-2 times daily or according to the mother's wishes. Utilizing music therapy only required a little money. It was a non-invasive activity that was harmless and could be done anywhere. Therefore, it was a valid alternative to increase milk production for postpartum mothers.

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