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A NARRATIVE REVIEW OF THE EFFECTS OF MOBILE INTERVENTION ON PREGNANT WOMEN WITH DEPRESSION

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Kata Kunci:

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ABSTRAK

Pregnancy is one of the events that every woman experiences before becoming a mother. Many physiological and psychological changes occur in the mother's body during this time. As a result, the mother and fetus suffer from a variety of unfavorable consequences, one of which is depression. Although doctors usually believe antidepressant medicines to be safe for severe depression, most pregnant women are hesitant to use them for fear of negative effects. The purpose of this study is to see how mobile treatments affect pregnant women who are depressed. The narrative review approach is used in this literature study. Search PubMed, EBSCO, and Science Direct databases for papers containing the keywords pregnant women, pregnancy, depression, and mobile intervention with inclusion criteria, such as articles published within the previous 10 years, forms of experimental study, in English, and full-text. Seven final papers were obtained as the number of final articles appropriate for evaluation. The findings of an analysis of seven studies on mobile interventions to reduce the prevalence of depression in pregnant women reveal a substantial decrease. Because mobile intervention is successful in lowering the prevalence of depression in pregnant women, it is advised that it be used as an alternative in delivering the intervention to pregnant women, particularly in situations of depression.

1. INTRODUCTION

Pregnancy is one of the events that every woman experiences before becoming a mother. These events are generally experienced for nine months or around 38 to 40 weeks (Said et al., 2021). Many physiological and psychological changes occur in the mother's body during this time. Physiological changes that occur in pregnant women generally are experiencing swelling in several areas of the body, hair loss, damage to the nails, breast enlargement, mild visual disturbances, bland taste in the sense of taste, and increased sensitivity to the

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sense of smell. In addition, pregnant women often experience changes in their skin, such as darkening of the facial skin and the appearance of stretch marks and black spots on the skin. There are also disturbances in the blood circulation system and respiratory system that can be experienced by pregnant women, such as increased blood pressure and heart rate, dizziness, shortness of breath, and dehydration (Krucik, 2012).

Increased levels of estrogen and progesterone during pregnancy affect the psychological aspects of pregnant women. This can be caused by hormonal changes that are experienced so pregnant women are more likely to face life situations that involve stress and anxiety (Chairunnisa and Fourianalistyawati, 2019). These feelings of stress or anxiety can lead to depression during pregnancy.

Emotional disturbances of pregnant women during pregnancy and after birth include anger, tension, nervousness, pathological anxiety, and symptoms of depression (Chairunnisa and Fourianalistyawati, 2019). Some moms with high-risk pregnancies feel depression because they are at a higher risk than usual (for both the mother and the baby) of sickness, disability, and even death before or after delivery (Fauzy and Fourianalistyawati, 2016).

In Indonesia, the prevalence of pregnancy depression was found to be 20% in mothers in the second and third trimesters (Handayani and Fourianalistyawati, 2018). The stigma attached to mental illness (anxiety or depression) is a major barrier to disclosure and seeking help during pregnancy (Ginting et al., 2022). According to recent research by Moore et al, many women in the peripartum phase are concerned about feeling or being perceived as "bad mothers" if they have a mental condition. They are also concerned that expressing their symptoms to healthcare practitioners would result in external stigma. Electronic programs (mobile intervention) can increase women's disclosure and strengthen treatment acceptance and adherence. In addition, this intervention also makes it easier for pregnant women to access health services safely because they do not need to go to health services directly, saves costs, saves time, and reduces mothers' worries about the negative stigma of depression in pregnant women (Forsell et al., 2017).

A cell phone, which allows users to run software programs, or a "smart"

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phone, which combines the characteristics of a cell phone and a PDA into a single device, are examples of mobile devices. (Fjeldsoe et al., 2009, Heron and Smyth, 2010). Mobile intervention refers to a technology method to offering psychological therapies outside of typical professional settings, such as phone psychotherapy, video conferencing, and internet-based interventions (Heron and Smyth, 2010, Patrick et al., 2009, Piette, 2007, Strecher, 2007).

It is hoped that early detection of depression in pregnant women and providing appropriate treatment using mobile intervention can reduce the incidence of low-birth-weight babies, premature births, and the risk of experiencing postpartum depression and maternal and child mortality (Szegda et al., 2014).

2. METHODS

The method used in this study was a narrative review regarding the effects of mobile intervention in pregnant women with depression. Article search in the database, namely PubMed, EBSCO, and Science Direct with inclusion criteria; articles for the last 10 years, namely 2012-2022, articles with the type of experimental research (research articles: randomized controlled trials, clinical trials, or quasi-experimental), the number of participants in the research is at least 30 respondents and articles in English and exclusion criteria, the type of research is non-experimental, does not discuss interventions related to mobile intervention and does not focus on discussing the effects of mobile intervention in pregnant women with depression.

In searching these databases, keywords are used using Boolean techniques in English which are arranged into one search sentence, namely "((pregnant women) OR (pregnant woman) OR (pregnancy)) AND ((mobile intervention) OR (intervention Digital)) AND ((Depression OR Depression))". Articles search using the PRISMA diagram (**Figure 1.**). The search results in stage I found 91 articles from PubMed, 711 articles from Science Direct, and seven articles from EBSCO so the total number of articles in stage I was 809 articles.

Then in stage II, a duplication check was carried out using Mendeley and there were 299 duplicate articles, so the number of articles became 510 articles. After entering the inclusion

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criteria in stage III, the results obtained were 15 articles (PubMed), 98 articles (Science Direct), and three articles (EBSCO) for a total of 116 articles. Then, in stage IV, we screened titles, abstracts, and full text and obtained seven articles that have the potential to provide mobile interventions for pregnant women with depression. How was the information gathered or generated? And how was it examined? The writing should be straightforward and concise, and it should always be in the past tense.

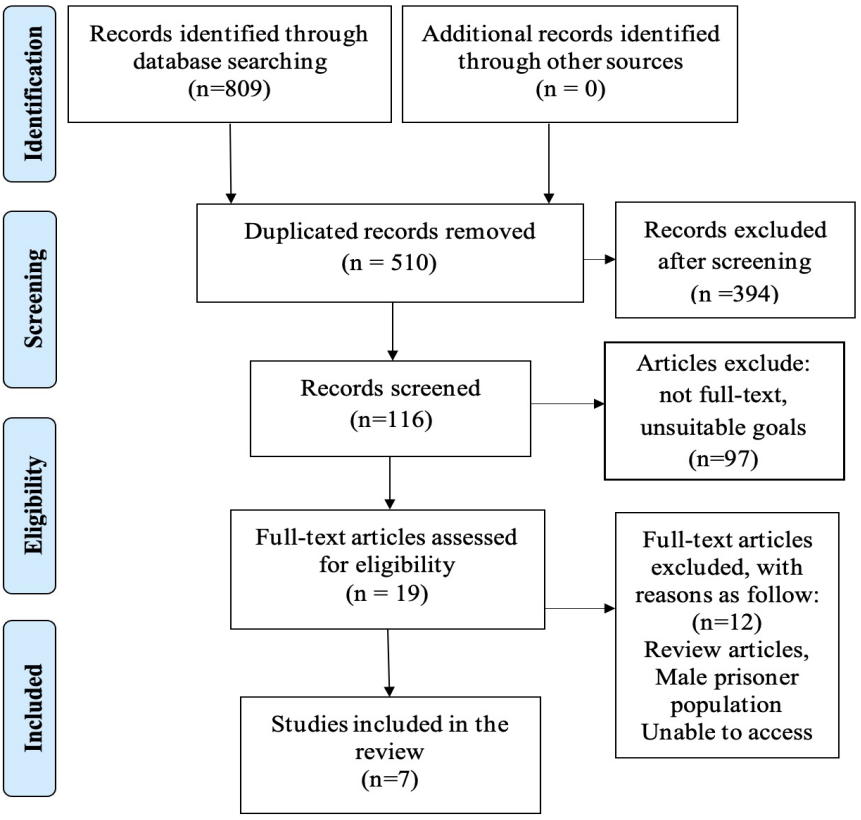

Figure 1. PRISMA Flow Chart

3. RESULT AND DISCUSSION

From the results of the studies reviewed, 7 articles met the criteria for this study and were selected for further analysis. Each study of the eight articles was conducted in various countries, such as China, the United States, Germany, Sweden, Canada, and Brazil. The seven articles focused on the population and research subjects of pregnant women with depression. All research articles (n=7) focused on the effects of mobile intervention (n=7). Several types of research methods

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were used from the eight articles that we obtained, namely using a randomized controlled trial (RCT) (n = 6) and an exploratory pilot study (n = 1). The results of the article review are presented in the data extraction table (**Table 1.**).

All of the publications in this study's sample are the outcomes of experimental research. A randomized controlled trial design is used in six research. (Sun et al., 2021, Kinser et al., 2021, Forsell et al., 2017, Liisa Hantsoo et al., 2018, Dalfen et al., 2021, Zuccolo et al., 2021), and there is 1 exploratory pilot study (Goetz et al., 2020). The sample selection method is following with experimental research standards. The random sampling technique is very important so that the results of the research can be implemented in the population and reduce bias in research.

This study's population consisted of pregnant women with depressive disorders who had Trimester 1, namely 1 - 12 weeks (Sun et al., 2021), Trimester 2, namely 13 - 28 weeks (Kinser et al., 2021, Forsell et al., 2017, Dalfen et al., 2021, Zuccolo et al., 2021), and Trimester 3, which is 28 - 41 weeks (Goetz et al., 2020, Liisa Hantsoo et al., 2018). The total number of respondents used in each study varied in the range <50 to >1000 respondents (Sun et al., 2021, Kinser et al., 2021, Forsell et al., 2017, Liisa Hantsoo et al., 2018, Goetz et al., 2020, Dalfen et al., 2021, Zuccolo et al., 2021). The duration of the intervention in each study was 1 week (Goetz et al., 2020), 1 month (Sun et al., 2021, Forsell et al., 2017), 2 months (Liisa Hantsoo et al., 2018, Zuccolo et al., 2018). al., 2021), 3 months (Dalfen et al., 2021), and 6 months (Kinser et al., 2021). The sample inclusion and exclusion criteria varied widely according to the specific objectives of the studies. The researchers had considered the sample criteria so as not to affect the final results of the study.

Table 1. Summary of Studies

Authors, Year, Country	Design, Sample size	Intervention	Results

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(Sun et al., 2021) China	Randomized Controlled Trial, 168	Mindfulness Behavioral Cognitive Therapy (MBCT) based on smartphones.	Using an RCT methodology, the findings show that self-help, smartphone-based mindfulness training is useful for prenatal depression symptoms. Women in the mindfulness group had a 60.9% lower incidence of positive depression symptoms at the post-intervention evaluation. Smartphone-based mindfulness training is especially beneficial for pregnant women, according to earlier research on pregnant women's preferences for Internet-based services.
(Kinser et al., 2021) USA	Randomized Controlled Trial, 1950	Self-management Intervention Internet and Mobile-Based Intervention (Mamma Mia)	One between-subject component (for groups) and one within-subject factor (Time: early, 37 weeks of gestation, 6 weeks postpartum, 3 months postpartum, and 6 months postpartum) are included in the model. The findings of this study are of particular importance, given the background of the pandemic and the fact that the "Mamma Mia" program assists pregnant and postpartum women without the necessity for face-to-face interaction. Emotional regulation may be achieved through intervention modules that encourage participants to enhance emotional awareness, understanding, and acceptance, as well as techniques for feeling good even in tough emotional settings.
(Goetz et al., 2020) Germany	Prospective pilot study with explorative study, 39	Brief Electronic Mindfulness-Based Intervention	The findings of 1 week of e-MBI training demonstrated a substantial reduction in anxiety levels (P.03). At the second evaluation, participants who completed more than 50% of the one-week course had a lower PRAQ-R score (P.05). After the intervention, there was no significant change in the EPDS score.

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(Liisa Hantsoo et al., 2018) USA	Randomized Controlled Trial, 72	MTA (Mood Tracking and Alert) Application	In terms of service delivery, the MTA group had considerably more telephone interactions with mental health professionals than the PP group (F=6.0, df=1 and 55, p=.02), although this group had no meaningful association. significant. Participants who received considerably more mental health referrals or adhered to referrals than the PP group. 17 women (41%) in the MTA group received phone calls from application providers. An exploratory examination of depression and anxiety symptoms found that the mean daily mood score was substantially positively linked with the number of calls received by participants in weeks 1-4 (p.05 for both comparisons). Over eight weeks, participants who received MTA-triggered calls consistently had higher PHQ-9 and GAD-7 scores than those who did not get MTA-triggered calls. This difference was significant for PHQ-9 at weeks 1-4 and for GAD-7 at weeks 3-4 (p.05 for both comparisons).
(Dalfen et al., 2021) Canada	Parallel-group pilot randomized controlled trial, (RCT) 63	Virtual psychiatric care for perinatal depression (Virtual-PND)	According to the study findings, the majority of participants (93.8%) felt comfortable interacting with their healthcare provider through video visit, received appropriate attention from their psychiatrist (93.8%), and considered that they had saved time by not having to travel to visits. Furthermore, the EPDS score decreased from 16.9 to 11.6 in the intervention group, with 60% of the intervention group having an EPDS 12, and from 16.9 to 12.4 in the control group, demonstrating that the Virtual Psychiatric Care intervention has a positive effect on pregnant women with depression.

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(Forsell et al., 2017) Sweden	Randomized Controlled Trial, 42	Internet-delivered cognitive behavior therapy (ICBT) for antenatal depression	Post-treatment depressed symptoms were considerably lower in the ICBT group (p 0.001, Hedgesg = 1.21) and they were more likely to react (i.e., achieve statistically reliable improvement) (RR = 0.36; p = 0.004). Treatment credibility, satisfaction, use, and adherence were comparable to when ICBT was used to treat depression.
(Zuccolo et al., 2021) Brazil	Randomized Controlled Trial, 70	App Motherly intervention	The results demonstrate the change in mother prenatal depression from baseline to post-treatment (8 weeks), and the study results suggest that the average smartphone application with depressed symptoms is 26.8%, which may rise to 47.8% when the bias is included. This finding is greater than that observed for individual psychotherapy for depression (19.9%), and it may provide a problem in analyzing the efficacy of app-based therapies, enhancing service quality, and psychotherapist monitoring of app use.

Based on the results of the analysis of seven articles, several interventions were found as an effort to help overcome depressive disorders in pregnant women by using mobile intervention or cellular-based interventions. From seven articles, several interventions were grouped, including two Mindfulness Interventions, namely Mindfulness-based interventions (Kinser et al., 2021), and electronic Mindfulness-based interventions (e-MBI) (Goetz et al., 2020). Then one intervention, namely the Internet and Mobile-Based Intervention, Mood Tracking and Alert (MTA) mobile application (Liisa Hantsoo et al., 2018). Virtual Psychiatric Care (Dalfen et al., 2021). Internet- delivered cognitive behavior therapy (ICBT) for antenatal depression (Forsell et al., 2017). The results of the analysis found that there were differences regarding the effect of the intervention given to pregnant women with depressive disorders.

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Pregnant women who have depressive disorders can harm antenatal care, resulting in growth retardation, low birth weight, and even more severe death for both mother and baby, so interventions can be made to reduce symptoms of depression in pregnant women.

Mindfulness-based therapies (MBI) assist individuals in changing core thinking patterns, investigating mind-body connections, and generating behavior modifications that can be especially beneficial for pregnant women coping with physical changes and social role changes. There are eight sessions in the 8-week mindfulness training program: 1) Mindful comprehension 2) Being in the present 3) Being aware of negative emotions 4) Accept adversity 5) Thoughts are just thoughts 6) Enjoy the joy of every day 7) Mindful pregnancy and childbirth 8) Continuous mindfulness practice. Meanwhile, e-MBI is a non-pharmacological intervention that provides mindfulness training through an application. How to carry out this intervention, namely the first step is to assess the psychometric data of pregnant women who are at risk using the EPDS (Edinburgh Postnatal Depression Scale), STAI (State-Trait Anxiety Inventory), and PRAQ (Pregnancy-Related Anxiety Questionnaire abridged version) instruments. This software includes instructional films and video files, interactive worksheets, and a personal "skill box" where you may gather useful exercises, movies, and texts. Smartphone-based mindfulness training is especially beneficial for pregnant mothers suffering from depression (Sun et al., 2021, Goetz et al., 2020). This is supported by the research of Sumakul and Wayong which states that mindfulness training emphasizes emotional management by applying the principles of meditation. Because meditation may lower a person's level of stimulation and bring about a calmer state, it is useful in decreasing anxiety and depression symptoms in pregnant women (Sumakul and Wayong, 2021).

Another type of intervention provided is to provide pragmatic solutions to overcome various obstacles for prevention and effective interventions in perinatal depression symptoms, independent management interventions, or internet and mobile interventions using the "Mamma Mia" application. The way to carry out this internet-based self-management intervention is that pregnant women

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will register first. The client will next engage in the "Mamma Mia" and "Mamma Mia Plus" applications, which consist of 44 modules with the primary components discussing participants' self-efficacy, self-emotional control, and perceived social support. In the event of a pandemic, the "Mamma Mia" program assists pregnant and postpartum women with depression symptoms without the requirement for face-to-face interaction (Kinser et al., 2021). According to Haga et al.'s research, many women with prenatal depression indicate interest in Internet therapies and claim that they would utilize the Internet to acquire depressive symptom management techniques. Internet-based therapies are cost-effective due to their scalability, making them particularly attractive for conditions with a high prevalence but low treatment-seeking rates (Haga et al., 2019).

Next is the Mood Tracking and Alert (MTA) mobile application intervention. The MTA (Mood Tracking and Alert) app provides patients with automated feedback or cues to connect directly with the mental health care team. Depression in pregnant women is common, the MTA app can alert the healthcare team when prenatal participants' mood symptoms worsen. MTA to evaluate the influence of a mood tracking and alertness (MTA) mobile application on patient participation and health care delivery in patients with depressive symptoms in the delivery context. Participants download the MTA application as well as a mobile app that provides access to a Patient Portal (PP) that alerts providers when the participant's mood symptoms deteriorate, encouraging the physician to contact the participant or the PP application and MTA application with incentives. Information that can be obtained includes medical history, and visits to mental health specialists as well as meetings explaining mental health (Liisa Hantsoo et al., 2018).

Virtual Psychiatric Care research has been shown to be useful in lowering depression rates in pregnant women. The intervention and control groups were compared in terms of many characteristics deemed to be risk factors for depression in pregnant women in this study. The control group got just in-person psychiatric follow-up clinic visits. Meanwhile, participants in the intervention group had the option of visiting a psychiatric clinic in person or conducting a secure video conference through the platform provided. In

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practice, users can utilize their device (mobile device, laptop, or personal computer), while the provider connects to the OTN system via their protected institutional desktop. Video visits are carried out using an audio-visual gateway compatible with PC and IOS operating systems. The psychiatrist will send an electronic invitation to the participant's email address shortly before the scheduled video appointment. Participants may access the secure link from them at the scheduled time, and the video visit can begin. By following per under Ontario's privacy laws, no videos may be recorded or kept in any form (Dalfen et al., 2021).

The intervention efficacy of internet-delivered Cognitive Behavior Therapy (ICBT) in reducing depression in pregnant women. ICBT is a self-help program that uses a secure online platform to offer reading materials (about 75,000 words), evaluations, assignments, and worksheets. Patients also have a CBT-trained therapist who is routinely supervised and gives regular feedback, encouragement, and support through written communication. This intervention was carried out in the following manner: eligible women were asked to log in and complete a pre-measurement online questionnaire before being randomized to treatment as usual (TAU), which was defined as the continuation of their current maternity care for 10 weeks, followed by optional ICBT, or ICBT was given immediately as an adjunct to maternity care. Post-measurements were conducted 10 weeks later, both online and by phone interview. Participants in TAU are provided ICBT with therapist help after completing post-measurements for ethical reasons. Those who have reached the 28th week of gestation after the TAU phase of 10 weeks are administered ICBT from 3-6 weeks postpartum (Forsell et al., 2017).

The App Motherly intervention method has proven successful in reducing depression in pregnant women. Motherly 1.0, which comprises a specialized intervention package defined by eight separate modules encompassing mental health, sleep patterns, nutrition, physical activity, social support, pregnancy assistance, and pre and postnatal material, will be available to the intervention group. These courses incorporate three major concepts: psychoeducation, behavior monitoring, and gamification aspects. In particular, the Motherly 1.0 application can display changes in the

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background appearance according to the participant's mood and use a questionnaire to obtain information (mood, habits, nutrition, etc.) (Zuccolo et al., 2021).

After analyzing the seven articles, it was shown that the depression experienced by pregnant women after being given non-pharmacological interventions in the form of mobile interventions or cellular-based interventions changed for the better, where there was a decrease in the level of depression. Pregnant women will experience physiological and psychological changes. One of the physiological changes in pregnant women is an increase in estrogen and progesterone levels it can increase the likelihood that pregnant women face life situations with feelings of stress or anxiety which then develop into feelings of depression. The most effective interventions for reducing depression rates in pregnant women are Mindfulness, namely Mindfulness-based interventions (Kinser et al., 2021) and electronic Mindfulness-based interventions (e-MBI) (Goetz et al., 2020) because these interventions will reduce depression, improve psychological well-being and health of pregnant women.

4. CONCLUSION

Based on the preceding discussion, it is possible to infer that the seven types of mobile interventions investigated had the impact of lowering the incidence of depression in pregnant women.

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