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ANXIETY MANAGEMENT METHODS THROUGH PHYSICAL ACTIVITY IN PREGNANT WOMEN: A LITERATURE REVIEW

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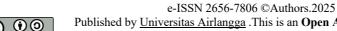
Abstract

Background: Anxiety and depression are the most common mental disorders in the peripartum period. Therefore, this study will examine more deeply the treatment of anxiety through physical activity in pregnant women. In Indonesia, there are 373,000,000 cases of anxiety that occur in pregnant women. A total of 107,000,000 or around 28.7% of these cases occur in pregnant women before the delivery process (RI, 2018). Therefore, this study will examine more deeply the management of anxiety through physical activity in pregnant women. Method: This study uses the Narrative Literature Review method, which begins with reading various relevant articles carefully, then summarizing, drawing conclusions, and identifying gaps that are relevant to the topic or research question. The article search used the following keywords: method AND managing OR reducing AND anxiety AND physical activity OR exercise OR yoga OR aerobic AND pregnant women. The inclusion criteria used in this research article are articles that discuss methods of managing anxiety through physical activity (all types of physical activity) in pregnant women. The articles used must be published in the range of 2020 to 2024 and fully accessible, and in Indonesian or English. The synthesis results found a total of 10 articles that met the inclusion criteria. Result: The review found that physical activity has positive benefits in reducing anxiety levels in pregnant women. Physical activity can be an effective strategy in managing anxiety through the influence of hormones and various psychosocial mechanisms. Various types of physical activity, such as moderate exercise, strength training, and yoga, can improve mood and reduce symptoms of depression and anxiety through biochemical and physiological processes. Therefore, the recommendation given by practitioners to pregnant women is to engage in moderate-intensity aerobic physical activity for at least 150 minutes per week.

keyword: SDGs, Maternal Health, Mental Health, Pregnancy, Physical Acitivity

INTRODUCTION

Expectant mothers face a variety of new difficulties and challenges. Some can adapt smoothly while others may have difficulty adjusting. This can increase the risk of mental disorders developing or even relapsing. Anxiety and depression are the most common mental disorders during the peripartum period. (Cena et al., 2021). Pregnancy anxiety is an affective state experienced by pregnant women related to anxiety about the mother's health during pregnancy, the baby's health,



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smooth labour, and future parenting (Schetter et al., 2022). It is common for women to experience mood and anxiety disorders, especially during childbearing years, and these conditions can worsen during pregnancy, so mental health problems often occur during pregnancy (Araji et al., 2020). Anxiety disorders during pregnancy and postpartum may be more common than depression, and if anxiety disorders occur during pregnancy, they often lead to postpartum depression.

Anxiety during pregnancy is associated with a history of pre-pregnancy anxiety and depression, history of abortion, history of still birth, history of elective abortion, unplanned or unwanted pregnancy, concerns for maternal and infant health, fear of labour, stressful life events, and changes in social support(Atif et al., 2020). This anxiety appears from the first trimester until the time of delivery, but some studies mention that the level of depression or anxiety in early pregnancy is comparable to general anxiety. Meanwhile, the level of depression or anxiety during the second and third trimester is almost double that of the first trimester (Puspitasari and Wahyuntari, 2020). Mental health during pregnancy is a worldwide health problem with a prevalence of 20% until the postpartum period. (Luo et al., 2022). A recent systematic review estimated an overall prevalence of 22.9%, with an increasing trend in each trimester (18.2%, 19.1%, and 24.6% in the first, second, and third trimesters, respectively) (Atif et al., 2020). In Indonesia, there are 373,000,000 cases of anxiety that occur in pregnant women. A total of 107,000,000 or about 28.7% of these cases occur in pregnant women before the labour process (RI, 2018).

Untreated anxiety during pregnancy is a major risk factor for developing postnatal depression, which can triple the risk. It is also associated with poor birth outcomes such as spontaneous abortion, preeclampsia, preterm birth, low infant weight, and suboptimal infant body growth. Anxiety during pregnancy can interfere with bonding between mother and child in the early postpartum period, reduce the likelihood of exclusive breastfeeding, and potentially negatively affect child development (Atif et al., 2020). Anxiety in pregnant women can trigger an increased stimulation of uterine contractions that can potentially increase blood pressure, which in turn can lead to preeclampsia and the risk of miscarriage.

Discomfort during pregnancy and anxiety towards the labour process lead to disturbed sleep patterns in pregnant women. One of the factors that cause sleep disturbances in them is the physical and emotional changes that occur during pregnancy (Rahmiyanti, Firdha; Pratama, 2023). What's more, children born to mothers who experience psychological distress during pregnancy have a higher tendency to experience cognitive, behavioural, and impaired communication skills (Luo et al., 2022).

During pregnancy, a mother is advised to keep doing physical activities such as light exercise to maintain her body condition. Physical activity has positive benefits for pregnant women, especially in reducing anxiety levels. It can reduce anxiety levels in pregnant women through the influence of hormones produced by the body (Kowalska, 2023). Physical activity is body movement that is performed using skeletal muscles and results in energy expenditure. Based on the results of the meta-analysis, it was found that physical activity has a positive impact on pregnancy including a decrease in the likelihood of depression and depressive symptoms. Recommendations given by practitioners to pregnant women focus on doing moderate intensity aerobic physical activity for at least 150 minutes per week (Cilar Budler and Budler, 2022). The connection between the beneficial effects of exercise on mental health comes from biochemical and physiological processes. These include increases in brain chemicals such as neurotransmitters and betaendorphins, which can improve mood and spirit, as well as psychosocial mechanisms such as changes in self-esteem and behavioural activation (Cai et al., 2022).

All types of physical activity and higher intensity exercise are known to help significantly reduce levels of depression and anxiety. Shorter or intermediate intervention programmes tend to provide greater effects compared to longer programmes, although longer programmes still provide significant positive benefits. Physical activity is effective in reducing depression and anxiety in all clinical conditions, although the magnitude of benefit varies between clinical groups. Different types of physical activity, such as aerobics, strength training, mixed exercise and yoga, all had positive effects. The positive effects of physical activity on depression and anxiety are likely due to a combination of diverse



psychological, neurophysiological and social mechanisms. Resistance training had the greatest impact on depression, while yoga and other mind-body exercises were more effective in reducing anxiety (Singh et al., 2023). This *literature review* examines in more depth the management of anxiety through physical activity in pregnant women.

METHOD

This study applies a literature review approach, which is a synthesis of several studies selected based on the theme of managing anxiety with physical activity methods in third trimester pregnant women. The search for research articles was conducted from July to August 2024. This study used the Narrative Literature Review method, which begins with reading relevant texts carefully, then summarising, drawing conclusions, and identifying gaps relevant to the topic or research question. The literature search used three databases, namely Google Scholar, Springer, and Sciencedirect. The article search used the following keywords: method AND managing OR reducing AND anxiety AND physical activity OR exercise OR yoga OR aerobic AND pregnant women. This literature review uses inclusion criteria, namely articles that discuss methods of managing anxiety through physical activity (all types of physical activity) in pregnant women, then articles published in the range of 2020 to 2024, fully accessible, and in Indonesian and English. Article searches conducted through related databases resulted in 17,900 articles from Google Scholar, 1000 articles from Science Direct, 2,500 articles from *Springer*. This review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The PRISMA guidelines is used as a literature search strategy up to the selection of relevant review articles. The article search was continued with a critical appraisal journal and obtained 10 articles that met the requirements.

RESULT AND DISCUSSION

Write the results of the study systematically, in general, the results begin with the number and characteristics of the research subjects, followed by the main results of the study. Presentation of research results can be done in 3 forms, namely narratives, tables, or figures. The research results refer to the list of questions (problem formulation) and hypotheses (if any). Clearly write down the hypothesis results obtained from the research. The table must be explained in the text. Rules for using tables, figures and graphs.

No	Title of Research	Author	Research Methods	Result
1	Long-term exercise from adolescence to adulthood reduces anxiety- and depression- like behaviors following maternal immune activation in offspring	Rahimi, Samira, et al (2020)	True Experimental	Long-term exercise significantly reduced anxiety-like and depressive behaviours in pre-born children exposed to maternal immune activation. It also decreased serum corticosterone levels, and increased brain levels of oxytocin and IL-10; whereas no significant changes were found in TNF-α, IL-1β, IL-6, and TNF-α.
2	Associations of physical activity, sedentary time, and physical fitness with mental health during pregnancy: The GESTAFIT project	Rodriguez- Ayloon et al, (2021)	Cross Sectional	Moderate to vigorous physical activity was negatively associated with depression (b = 0.222, adjusted ratio = 0.050, p = 0.041). Higher levels of sitting time were negatively associated with positive affect (b = 0.260, adjusted ratio = 0.085, p = 0.017). Greater upper body flexibility was positively associated with better emotion regulation (b = 0.195, adjusted ratio = 0.030, p = 0.047). Other relationships were not significant (all p > 0.05).
3	Reduction in physical activity signifcantly increases depression and anxiety in the perinatal period: a longitudinal study based on a self-report digital assessment tool	Haßdenteufel, K et al, (2020)	Mix Method (Qualitative and Quantitative)	A significant decrease in physical activity in general in the period from week 20 to week 32 of pregnancy. Expectant mothers who reported a greater decline during pregnancy showed significantly higher depression and anxiety scores. In stratified analyses, only baseline mental health score was shown to be a variable with a stronger impact on postnatal depression and anxiety outcomes.
4	The effectiveness of gentle prenatal yoga on the recovery of anxiety	Sulastri, A., et al (2021)	True Experimental	HARS scores in the intervention group showed that the mean rank of the pretest was 23.75, in the mid-test was 20.00, and in the post-test was 16.00. Meanwhile, in the



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No	Title of Research	Author	Research Methods	Result
	level in primigravid and multigravid pregnant women			control group, the pre-test mean rank value of 23.50, mid-test of 21.58, and post-test of 20.41 showed that the intervention group experienced a significant decrease in anxiety levels. From the Mann Whitney test results, the intervention group $p = 0.001 < (0.05)$ indicates that there is a significant change
5	The effect of pregnancy yoga exercise on reducing anxiety of pregnant woman third trimester	Rahayu, K,D., et al (2023)	Penelitian kualitatif	This study shows that yoga intervention during pregnancy has a significant effect in reducing anxiety in third trimester pregnant women with $p < 0.001$.
6	Is Prenatal Exercise with Prayer Movement Affecting Anxiety Level and Blood Pressure in Third Trimester?	Meiranny, A., et al (2022)	Quasy Experimental	The results showed that there was an effect of Muslim religious prayer movements on the level of anxiety and blood pressure of third trimester pregnant women with p<0.05.
7	The Effect of Pre Natal Exercise on Pain and Anxiety Third Pregnancy Primigravida in Sukomoro Public Health Center Magetan	Rahmawati, E., et al (2020)	Quasy Experimental	The results of this study indicate the effect of pregnancy exercises on reducing low back pain and anxiety in third trimester primigravida pregnant women.
8	The Effect Of Pregnancy Exercise On Third Trimester Primigravida Anxiety In Dealing With Childbirth	Astuti, P.A., et al (2020)	Quasy Experimental	The effect of pregnant gymnastics on third trimester primigravida anxiety in the treatment group with a p value (0.000) < (0.05). There is an effect of pregnant gymnastics on the anxiety of primigravida trimester III in the face of childbirth.
9	The Role of Yoga Exercises on the Level of Anxiety in Pregnant Women at the Bondowoso Health Center	Hasifah, H.,et al (2023)	Penelitian kuantitatif dengan pendekatan <i>pre</i> experimental study	The results showed that the highest level of anxiety of pregnant women before being given yoga exercises was at the level of severe anxiety (50%) and the anxiety level of pregnant women after being given yoga exercises was mostly at the level of moderate anxiety (63.3%). And the results of the analysis show a 2-tailed value of 0.000 which means there is an effect of yoga exercises on the anxiety level of pregnant women.
10	The Role of Yoga Exercises on the Level of Anxiety in Pregnant Women	Sriyoko, H, D., (2022)	Quasy Experimental	The effect of pregnant gymnastics on third trimester primigravida anxiety in the treatment group with a p

No	Title of Research	Author	Research Methods	Result
	at the Bondowoso			value $(0.000) < (0.05)$. There
	Health Center			is an effect of pregnant
				gymnastics on the anxiety of
				primigravida trimester III in
				the face of childbirth.
				The results showed a
				significant effect on the
				intervention group after
				gentle prenatal yoga. This
				study shows that there is an
				effect of gentle prenatal yoga
				on the anxiety level of third
				trimester pregnant women facing childbirth.

Women, especially those of childbearing age, often experience mood and anxiety disorders disproportionately, and mental health problems often worsen or emerge during pregnancy (Araji et al., 2020). Pregnancy triggers various physiological changes that impact the cardiovascular, hormonal and metabolic systems of the mother. Pregnancy is also commonly regarded as a period that increases the risk of mental disorders in women. Around 7% to 15% of women experience mental disorders during pregnancy (Rodriguez-Ayllon et al., 2021). Pregnant women need to be able to adapt to the pregnancy process. Anxiety is one of the factors that can hinder the achievement of optimal adaptation during pregnancy (Rahayu et al., 2023). Approximately 15-20% of pregnancies are considered high-risk, where the pregnancy faces one or more serious conditions that may affect the outcome of the pregnancy and/or the condition of the foetus. Highrisk pregnancies can exacerbate the stress that normally occurs during pregnancy, increasing anxiety and risk in a worsening cycle. Concerns during pregnancy are usually also related to several things, such as the wellbeing of the foetus, the mother's health condition, social and financial support, and the possibility of death (Araji et al., 2020)

Pharmacotherapy is the most frequently used treatment method for depressed patients, although most antidepressants have shown negative effects on the foetus in animal studies. Previous meta-analyses revealed that the effectiveness of antidepressants in treating depression in pregnant women is unclear. Antidepressant substances may have adverse effects on the foetus, non-pharmacological treatments, such as psychotherapy, music therapy and exercise, appear to be safer options to treat depression during pregnancy (Lin et al., 2022).



Much evidence suggests that exercise can reduce symptoms of clinical depression, including anxiety, in the general population (non-pregnant mothers). According to research conducted by Belvederi Murri and colleagues (2019), exercise has an effective antidepressant effect, especially if done regularly (e.g., 3 sessions per week for 12-24 weeks) (Jarbou and Newell, 2022). In recent years, there have been suggestions that physical activity (i.e. any body movement that increases energy expenditure beyond basal metabolic rate) may be associated with better mental health during pregnancy (Rodriguez-Ayllon et al., 2021). Physical activity plays an important role in preventing adverse birth outcomes for the mother and foetus, including preeclampsia, gestational diabetes, unnatural weight gain during pregnancy, premature birth, and mental disorders (Haßdenteufel et al., 2020).

Recent guidelines from the *American College of Obstetricians and Gynaecologists* (ACOG) recommend a minimum of 30 minutes of exercise most days of the week for pregnant women, provided there are no medical or obstetric complications ('Committee Opinion No. 650: Physical Activity and Exercise During Pregnancy and the Postpartum Period', 2015). This advice is in line with the general recommendation for adults to do 150 minutes of moderate-intensity aerobic activity as per current US and WHO guidelines, given that physical inactivity is one of the major risk factors for premature death globally. However, pregnant women usually do not follow this recommendation and tend to have a less active lifestyle. In addition, physical activity levels in general often decrease significantly during pregnancy (Haßdenteufel et al., 2020).

Pregnancy is a good time to start exercising, as it is associated with increased motivation to maintain or start a healthy lifestyle, and increased frequency of visits to the doctor, which facilitates physical exercise monitoring. Engaging in regular physical exercise during pregnancy is associated with various benefits, such as reduced risk of gestational diabetes, hypertensive disorders, operative delivery, excessive weight gain and weight retention after delivery, as well as postpartum depression, etc (Ribeiro et al., 2022). Some common physical activities during pregnancy include walking, pregnancy exercises, and pregnancy yoga (Astuti et al., 2021).

Aerobic exercise, lumbar stabilisation and stretching, water exercise, nerve and tendon slippage exercises, resistance training, and strength training have been reported to benefit the health and well-being of pregnant women. For all of these types of exercise, it is recommended that activities are performed at a moderate intensity during pregnancy (Cilar Budler and Budler, 2022). Participation rates in physical activity among pregnant women vary depending on different studies and geographical locations. Most studies show that pregnant women generally engage in low-mobility activities (such as sitting or housework), as well as walking, jogging, aerobics and floor exercises (Okafor and Goon, 2020). One of the common physical activities done by pregnant women is yoga.

Physical activities that are widely practised by pregnant women are yoga and pregnancy exercises. Yoga has become a popular sport around the world. Combining postures, breathing, and meditation, yoga is associated with improved health and body awareness. Various scientific literatures have confirmed the benefits of yoga, such as improved health as well as therapeutic effects on illness, depression, stress, and anxiety. Yoga seems to be more suitable for pregnant women than other physical activities due to the low intensity of the exercise (Lin et al., 2022). Evidence suggests that yoga during pregnancy is safe, practical and well received by pregnant women, and may offer greater benefits than walking and standard prenatal exercises for physical and mental health. Yoga is also thought to provide an opportunity for pregnant women to improve their health and strengthen their relationship with their baby. Two randomised control trials (RCTs) on yoga during pregnancy reported that yoga can reduce levels of pain, stress, anxiety and depression. (Corrigan et al., 2022).

In an initial study conducted by Astuti (2021), it showed that five primigravida pregnant women in their third trimester felt more relaxed after participating in pregnancy exercises, while one pregnant woman who did not participate in pregnancy exercises experienced moderate anxiety due to anxiety and fear of facing childbirth (Astuti et al., 2021). It was found that there was a decrease in the number of pregnant women who experienced severe anxiety, which was due to the fact that pregnant women who participated in pregnancy exercises felt more prepared for childbirth. The benefits of pregnancy exercises include increased



oxygen flow to the baby, maintenance of elasticity of the abdominal wall muscles, reduction of tension or pain due to pregnancy, management of complaints related to body shape changes, improved blood circulation, and acceleration of the recovery process after childbirth (Rahmawati et al., 2020)

Research conducted by Meiranny et al (2022) raised the theme of the effect of physical activity in prayer on the anxiety level of pregnant women. Prayer is an obligation for every Muslim who is eligible to perform it. Every movement in prayer has many benefits in terms of health and can have a therapeutic effect on the body. Performing prayer movements perfectly and correctly, the organs of the body can become healthier because prayer has a calming effect and provides relaxation, which can improve blood circulation and make the muscles in the body more relaxed. The results showed that the movement of pregnant gymnastics had an impact on anxiety and blood pressure of pregnant women in the third trimester (p<0.05). This study concludes that pregnancy exercises, including prayer movements, are effective in reducing anxiety levels and lowering blood pressure in third trimester pregnant women (Meiranny et al., 2022).

Physical activity has a significant effect in reducing anxiety in pregnant women. It can lower anxiety levels, especially during the pandemic, by reducing the stress and pressure that pregnant women face. Physical activity can improve sleep quality, which is often disrupted by anxiety and physical changes during pregnancy. Pregnant gymnastics and prenatal yoga, for example, can provide a steady relaxation effect, helping to reduce tension, anxiety, and depression during pregnancy, as well as increase calmness and focus. By engaging in regular and routine physical activity, pregnant women can minimise the effects of physical and emotional changes, such as cramps, oedema, and mood swings, which in turn helps to reduce pregnancy-related complaints and anxiety. Thus, physical activity plays an important role in reducing anxiety in pregnant women through various mechanisms, including stress reduction, improved sleep, relaxation, and readiness for labour. (Görücü et al., 2021).

CONCLUSION AND SUGGESTION

Physical activity plays a significant role in reducing the anxiety levels of pregnant women. A review revealed that exercise can improve hormonal balance, reduce stress, and improve sleep quality, all of which contribute to reduced anxiety. Physical activity can also improve skills and confidence, which are crucial for pregnant women in facing the challenges of pregnancy and labour. In an effort to improve the mental and physical health of pregnant women, regular and controlled physical activity is recommended. Pregnancy gymnastics and prenatal yoga can be an ideal choice as they can provide a stable relaxing effect on emotions, improve sleep quality, and minimise the effects of physical and psychological changes experienced during pregnancy. A doctor's consultation before starting a physical activity programme is essential to ensure its safety and effectiveness. A physical activity programme can help improve the mental and physical health of pregnant women, and prepare them to be healthy and happy parents.

DECLARATION

Conflict of Interest

The authors confirm that there are no conflicts of interest to disclose.

Authors' Contribution

NINP and RO collected the data and drafted the manuscript. RA critically reviewed and edited the original manuscript. All authors contributed significantly to the research, analysis, and writing of this article. Author designed the study and supervised data collection, performed statistical analysis, and contributed to data interpretation and manuscript preparation. All authors revised the manuscript and approved the final version.

Ethical Approval

This study did not use Ethical Approval

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Data Availability

All data discussed in this study are included in the manuscript. The analyzed datasets can be obtained from the corresponding author upon reasonable request.

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