



THE EFFECTIVENESS OF HEALTH EDUCATION INTERVENTIONS ON STRESS, ANXIETY, AND DEPRESSION AMONG PREGNANT WOMEN : A SYSTEMATIC REVIEW

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Abstract

Pregnancy is a vulnerable phase often accompanied by stress, anxiety, and depression, which may negatively impact both maternal and fetal health. One approach to managing psychosocial problems during pregnancy is through health education delivered directly to pregnant women. This study aims to Investigate role of direct health education interventions in decreasing stress, anxiety, and depression throughout pregnancy. The method A systematic review was conducted following the PRISMA guidelines by searching the Scopus, PubMed, and ProQuest databases. Study quality was systematically appraised utilizing the Joanna Briggs Institute (JBI) Critical Appraisal Tool. This review analyzed 12 randomized controlled trials (RCTs) conducted across six countries. Results: Of the 892 articles identified, 12 met the inclusion criteria, involving 30–1324 pregnant women across six countries. Health education interventions, including mindfulness, antenatal psychoeducation, cognitive-behavioral stress management (CBSM), lifestyle education, and spiritual approaches, were shown to reduce stress, anxiety, and depression, while enhancing self-efficacy, emotional regulation, childbirth preparedness, Maternal infant attachment, and healthy behaviors. The conclusion of this systematic review found that effective health education can improve the mental health of pregnant women and needs to be implemented as a promotive-preventive strategy during pregnancy.

Keywords: Education, Stress, Anxiety, Depression, Pregnant Women

@Jurnal Ners Prodi Sarjana Keperawatan & Profesi Ners FIK UP 2025

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INTRODUCTION

Pregnancy is regarded as a valuable phase in a woman’s life after marriage, although not all women have the opportunity to experience it. This period is often considered a special stage, A phase wherein expectant women commit to activities designed to support optimal fetal growth and developmental outcomes (Annisa, 2019). Pregnant women are vulnerable to critical periods that may affect their psychological well-being, often manifested in feelings of stress, anxiety, and even depression as they cope with the physical and biological changes associated with pregnancy (Marwah *et al.* , 2023).

Stress is defined as a physical and psychological disturbance that arises from life demands and changes, either due to environmental factors or an individual’s response to their environment (Annisa, 2019). Stress in pregnant women is a common concern arising from the various changes experienced during pregnancy (Velga and Suryani, 2022). Stress during pregnancy may arise from both physical and psychosocial conditions and is influenced by internal as well as external factors (Larasati *et al.*, 2024).

The proportion of individuals experiencing stress and depression is estimated at 7–20% in developed contexts, rising to above 20% in developing contexts. In Indonesia, it is estimated that approximately 373,000 pregnant women experience stress, with around 107,000 or 28.7% encountering stress during the perinatal stage (Sari *et al.*, 2023). Study conducted by Suryanti in 2017 revealed that among 102 pregnant women surveyed, 65 (63.6%) experienced stress. These findings indicate that stress is a common issue faced by pregnant women (Hasni and Evie, 2022).

Elevated stress and anxiety among pregnant women can negatively impact maternal health and fetal development (Marwah, 2023). Sustained stress and anxiety in pregnant women may elevate cortisol concentrations, leading to vasoconstriction, restricted oxygen supply to the fetus, and intrauterine growth restriction (IUGR). Such a condition has also been associated with greater risks of preterm birth, low neonatal weight, and pregnancy loss (Selfiana, Ulfadamayanti and Maani, 2023).

Pregnant women experiencing stress are more susceptible to sleep disturbances, loss of appetite, uterine infections, as well as increased fatigue, anxiety, sadness, and reduced motivation (Selfiana, 2023). Other impacts may manifest through physical symptoms such as palpitations, increased blood pressure, elevated gastric acid, shortness of breath, as well as emotional changes (Larasati, 2024). Prolonged stress may lead to depression. Symptoms of depression in pregnant women may include difficulty concentrating, decreased self-esteem and confidence, persistent sadness, feelings of guilt, pessimistic outlook, loss of interest in usual activities, sleep disturbances, reduced appetite, and even suicidal thoughts (Susilowati, 2017).

One of the efforts to reduce stress levels in pregnant women is through counseling or health education (Wahyusari, 2022). Health education is a series of activities aimed at promoting healthy

behaviors, with the primary goal of improving public health and preventing mental health problems (Pitayanti *et al.*, 2024).

In consonance with the foregoing exposition, there remains an exigent necessity for more profound scientific inquiry to substantiate the veracity of the purported efficacy of direct face-to-face health education interventions in the attenuation of stress, anxiety, and depressive symptomatology among gravid women. The principal orientation of this systematic review is to undertake a comprehensive scrutiny of the extent to which such interventions contribute to the enhancement of maternal psychological well-being with particular emphasis on the alleviation of gestational stress, anxiety, and depression. Accordingly, the central research question seeks to explore how effective direct health education strategies are in mitigating psychological distress the course of pregnancy. This review is predominantly oriented toward experimental inquiries with particular emphasis on randomized controlled trials (RCTs). Through the integration of findings amassed from a wide array of empirical investigations, the present review aspires to engender a comprehensive understanding of the beneficial ramifications of directly administered health education interventions on the psychological well-being of pregnant women.

METHOD

Design

This study is a systematic review that examines the use of health education interventions in addressing stress, anxiety, and depression among pregnant women. It also explores the types of interventions delivered, their duration, the instruments used for measurement, and the outcomes achieved. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were used to conduct this systematic review, followed by data extraction, synthesis, and analysis.

Search Strategy

All relevant studies were then systematically identified based on three databases: Scopus, PubMed, and ProQuest. Database search was conducted from the inception of each database until September 1, 2025.

The keywords used in the search were: *Health education OR Education, Health OR Health Behavior OR health promotion OR Health intervention OR Health Services OR Mental Health Services AND Stress OR Psychological OR Emotional Exhaustion AND Anxiety OR Emotions OR Frustration AND Depression OR Mood Disorders OR Depressive Disorder AND Prenatal OR antenatal OR Pregnant OR Maternal OR Perinatal OR Gestation OR Pregnancy OR Prepartum.*

Eligibility Criteria

Inclusion criteria were determined through PICOS which consists of Population (P): Studies involving pregnant women of various ages and types of pregnancy, both primiparous and multiparous. Intervention (I): Studies that implement interventions in the form of health education

provided directly to patients without intermediaries. Comparator (C): Studies that compare health education with standard treatment such as routine visits to health facilities for physical examinations only without providing education. Outcome (O): studies that report results related to reducing stress, anxiety and depression during pregnancy. Study design (S): a randomized controlled trial (RCT) study published in English from 2015-2025. The exclusion criteria include: (a) studies that are not aligned with the scope of the PICOS framework; (b) studies without full text availability; and (c) types of Study Protocols, Case-Control Studies, Case Reports, Case Series, Prevalence Studies, Qualitative Studies, Quantitative Studies, and Systematic Reviews.

Study Selection and Data Extraction

The systematic search yielded 892 articles from three databases totaling 892 articles with details of Scopus (n = 459), PubMed (n = 333), and ProQuest (n = 100), as documented in the PRISMA flowchart. In the initial stage, 100 articles were removed due to duplicates detected through the Mendeley application, followed by 60 articles excluded through automatic filtering due to non-article document types, years beyond the 2015-2025 timeframe, and inappropriate language, while 50 articles were excluded for other reasons such as being irrelevant to the topic, leaving 682 articles for further evaluation. Title and abstract screening excluded 470 articles that did not match the title and abstract. Furthermore, 212 full-text articles were assessed for eligibility with the result that 200 articles were excluded for not meeting the inclusion criteria, including 78 due to irrelevant populations, 95 due to inappropriate interventions, and 27 due to inappropriate study designs. Finally, 12 studies met the inclusion requirements and were included in this systematic review. The article screening process is presented in the PRISMA flow diagram below.

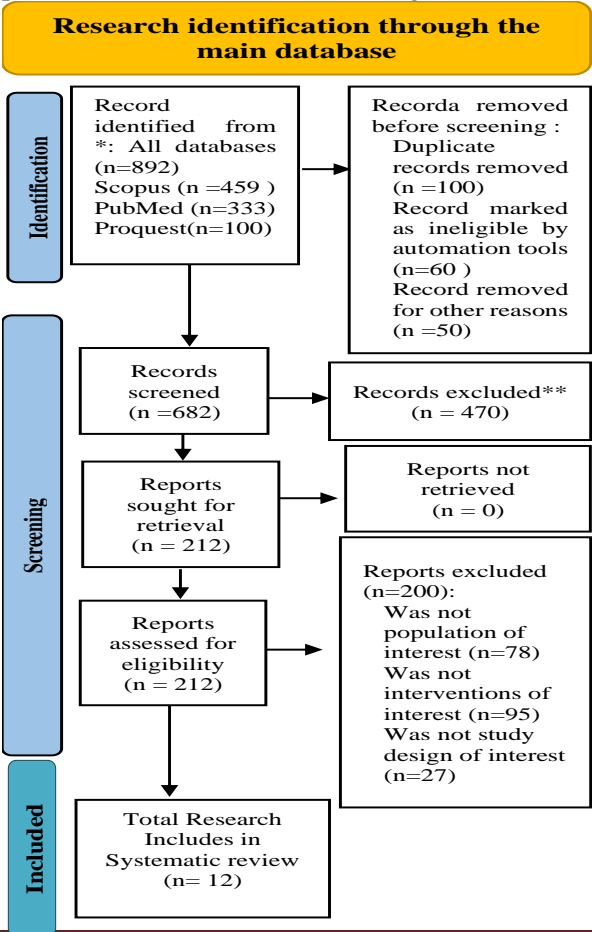


Figure 1. PRISMA flow Diagram Showing the Screening and Selection Process

Researchers independently extracted 12 included studies using Excel to obtain primary data from the articles, including author names, year of publication, country of origin, study design, participants, type of intervention, instruments, and outcomes. The entire process was conducted systematically to ensure completeness and accuracy of the data in the synthesis of the results.

Risk of Bias Assessment

The methodological quality of each study included in this review was assessed using the Joanna Briggs Institute's (JBI) Critical Appraisal Checklist for randomized controlled trial (RCT) design. The JBI RCT design checklist includes 13 indicators that assess the methodological rigor of the process, including randomization and allocation concealment, blinding, consistency of measurements, completeness of follow-up, and appropriateness of statistical analysis. Of the studies analyzed, methodological quality ranged from 77% to 92%, with most studies meeting 11 of the 13 criteria and therefore being deemed methodologically sound (75%).

The most common weaknesses were identified in the blinding of participants and implementers (D4–D5), where 9 studies failed to blind due to the inherent difficulty of blinding digital interventions. Furthermore, several studies did not specify the method of allocation concealment (D2), potentially increasing the risk of selection bias. However, the strengths of the studies were seen in the use of consistent measurements, complete follow-up, and appropriate statistical analysis, ensuring the validity of the results.

Table 1. Criteria for Assessment of Research Results

No	Author, and Year Study	Design	JBI (%) Critical Appraisal
1	(Gennaro, 2024)	RCT	11/13 (77%)
2	(Feli, 2024)	RCT	11/13 (85%)
3	(Çankaya, 2021)	RCT	12/13 (92%)
4	(Chaharrahifard, 2021)	RCT	11/13 (85%)
5	(Li, 2020)	RCT	11/13 (85%)
6	(Sanaeinasab, 2020)	RCT	11/13 (85%)
7	(Sbrilli, 2020)	RCT	12/13 (92%)
8	(Pan, 2018)	RCT	12/13 (92%)
9	(Zhao, 2018)	RCT	12/13 (92%)
10	(Kenyon, 2016)	RCT	11/13 (85%)
11	(Jesse, 2016)	RCT	11/13 (85%)
12	(Sanaati, 2016)	RCT	11/13 (85%)

Note : The minimum inclusion score of 75% was achieved by all studies.

Data Synthesis

Data synthesis provides an overview of the

pregnant women population, types of educational interventions delivered individually or in groups, study designs, and the outcomes of each study. The analysis is presented narratively and supplemented with tables to clarify the findings. A total of 12 articles were analyzed, originating from six countries: Iran (4 articles), China (2 articles), the United States (3 articles), Turkey (1 article), Taiwan (1 article), and the United Kingdom (1 article). Based on the number of articles, most studies were conducted in Asia (75%), with the highest concentration in Iran and the United States. In contrast, research conducted in Western contexts, including the United States and the United Kingdom, predominantly highlighted mindfulness-oriented strategies, interventions fostering social support, and culturally tailored cognitive behavioral approaches.

RESULTS AND DISCUSSION

Study Characteristics

Analyzed studies demonstrated diversity in intervention designs, sample sizes, and instruments used. All studies employed a randomized controlled trial (RCT) design, with participants ranging from 30 to 1,324 pregnant women across countries including the United States, China, Iran, Turkey, Taiwan, and the United Kingdom. Most interventions focused on psychological and educational approaches, including mindfulness-based counseling, structured antenatal education, midwife-led psychoeducation, cognitive-behavioral stress management, as well as spiritual and lifestyle education interventions. All included studies met the minimum quality score of 75%, indicating good methodological quality. The characteristics of the included studies are summarized in Table 3.

Table 2. Characteristics of the included studies

No	Author, Year / Country	Study Design	Participant (Sample size)	Intervention Type		Instrument	Outcome (measurements)
				Intervention	Control		
1	Effects of Two Group Prenatal Care Interventions on Mental Health: An RCT (Gennaro et al., 2024) United States	Randomized Controlled Trial (RCT)	120 twin pregnancies (109 completed) and 299 Black & Hispanic pregnant women (168 analyzed)	The intervention groups received Mindfulness Group Training (MGT) delivered online for 6 weeks (120 minutes/session) and COPE-P (face-to-face CBT, 6 sessions)	The control groups received usual care with health education via WeChat or pregnancy education based on ACOG guidelines (PregnancyPlus, face-to-face).	EPDS, SAI, PSS, FFMQ, GAD-7, Healthy Lifestyle Scales	COPE-P did not demonstrate significant differences compared to PregnancyPlus, but both interventions reduced depression, stress, and anxiety, and improved maternal beliefs and healthy lifestyle behaviors over time.
2	The effect of mindfulness-based counselling on the anxiety levels and childbirth satisfaction among primiparous pregnant women: a randomized controlled trial (Feli et al., 2024) Iran	Randomized Controlled Trial (RCT)	60 primiparous pregnant women (55 completed) in Kermanshah	Intervention: 8 face-to-face group sessions of mindfulness-based counseling (Mindfulness-Based Childbirth and Parenting, 60–90 min, twice a week for 4 weeks) + routine prenatal care	routine prenatal care only.	Pregnancy-Related Anxiety Questionnaire (PRAQ), Scales for Measuring Maternal Satisfaction (SMMS)	A significant reduction in anxiety was observed within the intervention group both immediately following the intervention (p = 0.001) and at the one-month follow-up (p = 0.001). Childbirth satisfaction was significantly higher (p≤0.001)
3	Effects of Antenatal Education on Fear of Birth, Depression, Anxiety, Childbirth Self-	Randomized Controlled Trial (RCT)	An assemblage of 120 first-time expectant mothers, of whom 112 concluded the	Structured antenatal education in group classes (8–10 women) using presentations,	routine prenatal care at outpatient clinics.	W-DEQ-B, DASS-21, CBSEI	The intervention group experienced significant reductions in fear,

No	Author, Year /	Study	Participant	Intervention Type		Instrument	Outcome
	Efficacy, and Mode of Delivery in Primiparous Pregnant Women: A Prospective Randomized Controlled Study (Çankaya, 2021) / Turkey		study, enrolled at a regional maternity institution in Central Anatolia.	role play, videos, simulations, drama, and relaxation exercises.	Delivered face-to-face twice per week for 2 weeks (total 16 hr)		depression, anxiety, and labor stress and increased self-efficacy, with effects persisting postpartum (p < 0.05–0.001). Moreover, vaginal delivery occurred at a significantly higher rate among the intervention group (p = 0.043).
4	The Effect of Midwife-led Psycho-Education on Parental Stress, Postpartum Depression and Parental Competency in High Risk Pregnancy Women: A Randomized Controlled Trial (Chaharrahifard et al., 2021) / Iran	Randomized Controlled Trial (RCT)	66 nulliparous women with high-risk pregnancy admitted to Kamali Hospital, Karaj	Midwife-led psycho-education: 4 face-to-face sessions (2 group sessions during pregnancy + 2 individual sessions immediately postpartum) in addition to routine care	routine care only.	Parenting Stress Index, Parental Competency Questionnaire, Postpartum Depression Questionnaire	The intervention during pregnancy reduced parental stress significantly. In the postpartum period, it further reduced postpartum depression and increased parental competency. The study did not directly measure anxiety, but the reduction in stress and depression indicates improved maternal psychological well-being.
5	Cognitive behavior stress management during pregnancy: a randomized controlled trial (Li et al., 2020)/ China	Randomized Controlled Trial (RCT)	The sample consisted of 100 women 6–8 weeks pregnant from the obstetrics clinic of Bengbu Medical College.	Cognitive-Behavioral Stress Management (delivered face-to-face) from weeks 8–38 of pregnancy, plus routine antenatal care.	routine antenatal care and health education only	PPS at baseline, 8th week, and 39th week of pregnancy	Both groups showed an increase in stress scores toward late pregnancy, but the increase was significantly lower in the intervention group compared to controls (p < 0.01). CBSM was effective in reducing pregnancy-related stress, though depression and anxiety were not measured.
6	A spiritual intervention to reduce stress,	Randomized Controlled Trial (RCT)	84 nulliparous pregnant	A spiritually-integrated cognitive-	routine antenatal care only.	Stress, anxiety, and depression	The intervention group showed

No	Author, Year /	Study	Participant	Intervention Type		Instrument	Outcome
	anxiety and depression in pregnant women: Randomized controlled trial (Sanaeinasab et al., 2020)/ Iran		women in their first trimester (ages 20–35) from two general hospitals in Tehran	behavioral group program with 4 weekly 90-minute face-to-face sessions (6–10 participants) over 8 weeks. Sessions included short lectures, group discussions, Islamic-based spiritual coping strategies, and educational materials (pamphlets, CDs, online social network support)		scales; blood pressure	significant reductions in stress (-41%), anxiety (-28%), depression (-41%), and blood pressure, confirming the effectiveness of spiritual interventions for maternal psychological and physiological well-being.
7	Effects of prenatal mindfulness-based childbirth education on child-bearers’ trajectories of distress: a randomized control trial (Sbrilli et al., 2020)/US	Randomized Controlled Trial (RCT)	30 nulliparous pregnant women in the third trimester, healthy low-risk pregnancies, planning hospital birth	Mind in Labor (MIL), a condensed mindfulness-based childbirth education program delivered face-to-face in an intensive 2.5-day weekend (18 hours total). Included formal mindfulness meditation, coping strategies for labor pain/fear, experiential exercises, didactic teaching, and supplemental handouts/audio. Most attended with a birth partner	Control (TAU): standard childbirth education classes from community resources without mindfulness, yoga, or mind-body focus.	CES-D, STAIT, PSS, and FFMQ	Participants in the MIL program demonstrated greater reductions in psychological distress from pregnancy through 12 months postpartum, with a statistically significant decline in depressive symptoms (p = 0.041). Stress and anxiety also trended downward but were not statistically significant. Effects were strongest for women with higher baseline anxiety and lower mindfulness.
8	Mindfulness-based programme on the psychological health of pregnant women (Pan et al., 2018)/ Taiwan	Randomized Controlled Trial (RCT)	104 pregnant women (96 completed), 13–28 weeks gestation	Eight-week Mindfulness-Based Childbirth and Parenting program (weekly 3-hour sessions + one 7-hour silent retreat), in-person, with at-home practice using audio recordings.	Received traditional childbirth education classes.	PSS, EPDS, CBSEI-32, FFMQ	The MBCP group showed significant reductions in stress (p = 0.01) and depression (p < 0.001) compared to control, along with increases in childbirth self-efficacy (p < 0.001) and mindfulness (p = 0.001) by week 36 of gestation. The program was effective in

No	Author, Year /	Study	Participant	Intervention Type	Instrument	Outcome	
						improving perinatal mental health outcomes.	
9	Effects of antenatal depression screening and intervention among Chinese high-risk pregnant women with medically defined complications: A randomized controlled trial (Zhao et al., 2018)/ China	Randomized Controlled Trial (RCT)	352 high-risk pregnant women with obstetrical complications, EPDS ≥9 or PDSS ≥60 (176 intervention, 176 control)	Six-session face-to-face group psychological intervention, including one session with husbands	Usual antenatal care only.	EPDS, PDSS	The intervention group experienced a significant reduction in depression during pregnancy up to 42 days postpartum (p < 0.05), regardless of the frequency of attendance and participation of the husband, indicating the effectiveness of the program in high-risk pregnant women.
10	Lay support for pregnant women with social risk: a randomised controlled trial (Kenyon et al., 2016)/UK	Randomized Controlled Trial (RCT)	1324 nulliparous pregnant women with ≥1 social risk factor (662 intervention, 662 control)	Pregnancy Outreach Worker (POW) service providing direct lay support with home visits and case management, starting during pregnancy (≤28 weeks) until 6 weeks postpartum.	Standard maternity care with possible referral to specialist midwives	EPDS, Mother-to-Infant Bonding Scale, antenatal attendance records	During pregnancy, antenatal visits were similar between groups; 8–12 weeks postpartum, the intervention group showed a decrease in EPDS scores in mothers with ≥2 social risk factors and an increase in mother-infant bonding. POW support thus reduced postpartum depressive symptoms in high-risk subgroups and improved bonding.
11	Performance of a Culturally Tailored Cognitive Behavioral Intervention (CBI) Integrated in a Public Health Setting to Reduce Risk of Antepartum Depression: A Randomized Clinical Trial (Jesse, 2016)/ US	Randomized Controlled Trial (RCT)	146 rural, low-income, minority pregnant women (high-risk and low-moderate risk for antepartum depression)	6-week culturally tailored face-to-face group Cognitive Behavioral Intervention (CBI) during pregnancy.	Usual prenatal care	EPDS, Beck Depression Inventory (BDI-II)	Both groups showed reductions in depression (EPDS, BDI-II). Low-moderate risk women in the intervention group had significantly greater reductions in depressive symptoms than control. High-risk African-American

No	Author, Year /	Study	Participant	Intervention Type	Instrument	Outcome	
						women also had significant decreases in depression from baseline to post-intervention and 1-month follow-up. The intervention was effective in reducing antepartum depression,	
12	The effect of lifestyle-based education to women and their husbands on the anxiety and depression during pregnancy: a randomized controlled trial (Sanaati et al., 2016)/ Iran	Randomized Controlled Trial (RCT)	189 pregnant women (24-28 weeks gestation, non-depressed, singleton pregnancy)	Intervention Group 1 received lifestyle education for women and their husbands (face-to-face during the mother's pregnancy). Intervention Group 2 received lifestyle education specifically for women (face-to-face during the pregnancy).	Routine prenatal care only.	STAI, BDI-II	During pregnancy antenatal visits were similar between groups, namely 8–12 weeks postpartum, the intervention group showed a decrease in EPDS scores in mothers with ≥2 social risk factors and an increase in mother-infant bonding.

Types of Interventions

Based on the 12 analyzed studies, interventions aimed at addressing stress, anxiety, and depression in pregnant women can be categorized into several types. The first and most common type is mindfulness-based interventions, which include Mindfulness Group Training (MGT), Mindfulness-Based Childbirth and Parenting (MBCP), and Mind in Labor (MIL), delivered either online or face-to-face (Gennaro *et al.*, 2024; Feli *et al.*, 2024; Pan *et al.*, 2018; Sbrilli *et al.*, 2020). Second, type of intervention is psychoeducation and antenatal education, delivered through various formats such as group classes, role-playing, simulations, and relaxation exercises. Midwife-led psychoeducation focuses on pregnancy knowledge, coping strategies, and enhancing parental competence (Çankaya, 2021; Chaharrahifard *et al.*, 2021). Third, type is cognitive-behavioral interventions (CBT), delivered either in group or individual formats, such as Cognitive-Behavioral Stress Management (CBSM) and the COPE-P program (Li *et al.*, 2020; Jesse, 2016; Gennaro *et al.*, 2024). Fourth, type is spiritual interventions, which integrate religious values (Sanaeinasab, 2020). Fifth, type is social and family support interventions, including programs such as the Pregnancy Outreach Worker (POW) and partner involvement in lifestyle education (Kenyon *et al.*, 2016; Sanaati *et al.*, 2016).

Effectiveness of Interventions in Reducing Stress

Study results indicate that educational interventions such as mindfulness, psychoeducation, CBT, and spiritual approaches are effective in reducing stress among pregnant women. Mindfulness reduces stress through meditation, relaxation, and coping strategies for labor, while CBT programs like COPE-P teach cognitive-behavioral skills, including cognitive reframing, positive thinking, stress management, and effective communication. According to Gennaro *et al.*, (2024), no significant difference was found between the CBT group and the control group receiving standard antenatal education from ACOG; however, both groups still demonstrated improvements in mental health, influenced by the implementation of CBT within the Group Prenatal Care (GPC) framework, despite having a lower session frequency than the standard. Psychoeducational interventions in the study by Chaharrahifard *et al.*, (2021) ed by midwives for expectant mothers classified as high risk, were also shown to significantly reduce stress, while Cognitive-Behavioral Stress Management (CBSM) interventions helped prevent increases in stress scores toward the end of pregnancy compared to the control group (Li, 2020). Additionally, spiritual interventions contributed substantially, reducing stress levels by up to 41% from baseline These findings underscore that educational interventions based on psychological skills, healthcare professional support, and spiritual reinforcement have strong potential to reduce pregnancy-related stress, although their effectiveness remains influenced by implementation context and

participant engagement.

Effectiveness of Interventions in Reducing Anxiety

Pregnancy-related anxiety can be alleviated through various psychological and educational interventions. Mindfulness interventions have been shown to reduce anxiety related to pregnancy and childbirth (Feli *et al.*, 2024; Pan *et al.*, 2018). Psychoeducation and antenatal education decrease anxiety through labor simulations and relaxation exercises (Çankaya, 2021). CBT and spiritual programs also significantly reduce anxiety (Li *et al.*, 2020; Sanaeinasab *et al.*, 2020). Social support, including partner involvement in lifestyle education, has been shown to reduce both state and trait anxiety more effectively than interventions targeting only the mother (Sanaati, 2016).

Effectiveness of Interventions in Reducing Depression

Several interventions have been found to influence reductions in depression among pregnant women. Both antenatal and postpartum depression can be alleviated through various types of interventions. Interventions grounded in mindfulness have demonstrated efficacy in alleviating depressive symptoms and fostering improved maternal psychological well-being (Gennaro *et al.*, 2024 ; Pan *et al.*, 2018; Sbrilli *et al.*, 2020). Psychoeducation and antenatal education also play an important role in decreasing depression and improving childbirth self-efficacy (Çankaya, 2021; Chaharrahifard *et al.*, 2021). Cognitive-behavioral interventions (CBT) and culturally adapted programs have demonstrated effectiveness for pregnant women across low- to high-risk populations (Jesse, 2016; Li *et al.*, 2020; Gennaro *et al.*, 2024). In addition, spiritual interventions significantly reduced depression levels by up to 41% from baseline (Sanaeinasab, 2020). Social support interventions, such as the Pregnancy Outreach Worker (POW) program and partner involvement in lifestyle education, further contributed to reducing depression and enhancing the emotional bond between mother and fetus (Kenyon *et al.*, 2016; Sanaati *et al.*, 2016).

Types of Measurement Instruments

Psychometric instruments were used in several studies to assess stress, anxiety, and depression among pregnant women. Depression was most frequently measured using the Edinburgh Postnatal Depression Scale (EPDS) (Gennaro *et al.*, 2024; Zhao *et al.*, 2018; Jesse, 2016; Kenyon *et al.*, 2016). Depression, anxiety, and stress were assessed simultaneously using the Depression Anxiety Stress Scale (DASS-21) (Çankaya, 2021). Pregnancy-specific anxiety was evaluated with the Pregnancy-Related Anxiety Questionnaire (PRAQ) and the Spielberger State-Trait Anxiety Inventory (STAI) (Feli *et al.*, 2024; Sanaati *et al.*, 2016). Stress was commonly measured using the Perceived Stress Scale (PSS) and the Pregnancy Pressure Scale (PPS) (Pan *et al.*, 2018; Li *et al.*, 2020). Additional instruments were employed to capture more specific aspects,

including the Childbirth Self-Efficacy Inventory (CBSEI), the Five Facet Mindfulness Questionnaire (FFMQ), and the Parental Competency Questionnaire (Çankaya, 2021; Pan *et al.*, 2018; Chaharrahifard *et al.*, 2021). The variation in instruments reflects a multidimensional approach to evaluating maternal mental health, encompassing both general psychological aspects and pregnancy-specific contexts.

DISCUSSION

Providing health education and counseling to pregnant women is crucial for preventing excessive anxiety (Yuliani and Rochmawati, 2023). Health education serves as a promotive and preventive effort by delivering health information, aiming to enable individuals to maintain their health, prevent and manage health problems, and understand how to seek appropriate assistance when needed. The information obtained by pregnant women during antenatal visits or through prenatal classes can contribute to reducing the risk of depression, as it equips them with more positive coping strategies (Zuhana, 2023).

The review of 12 studies indicated that health education interventions significantly contributed to the reduction of stress, anxiety, and depression in pregnant women. The first type of intervention, mindfulness-based programs such as Mindfulness Group Training (MGT), Mindfulness-Based Childbirth and Parenting (MBCP), and Mind in Labor (MIL), was shown to be effective in enhancing self-efficacy, emotional regulation, and coping strategies among pregnant women. This improvement in coping capacity has implications for lowering stress and depressive symptoms during pregnant (Gennaro *et al.*, 2024; Feli *et al.*, 2024; Pan *et al.*, 2018; Sbrilli *et al.*, 2020). These findings are also consistent with the case report by Hapsari, et al, (2021) which noted that mindfulness reduced pregnancy-related anxiety in some participants, although not in all, due to certain triggering factors. Nevertheless, this intervention remains an effective psychological alternative, providing both physical and psychological benefits for pregnant women. Mindfulness interventions also contribute to increased comfort during pregnancy and improved emotional regulation abilities (Sugarni *et al.*, 2025).

The second type of intervention, psychoeducation and antenatal education delivered through group classes using presentations, role-playing, simulations, and relaxation exercises, was effective in reducing anxiety, depression, and fear of childbirth. This intervention also enhanced parental competence and preparedness for delivery, indicating that structured education can support the psychological well-being of pregnant women (Çankaya, 2021; Chaharrahifard *et al.*, 2021). These findings align with the study by Darma *et al.*, (2024) which showed that third-trimester pregnant women in the psychoeducation intervention group had lower mental health scores compared to the control group, reflecting better psychological conditions. The effectiveness of psychoeducation was evident in the reduction of stress and anxiety, supported by active participation of pregnant women and a positive

social environment. Statistical analysis confirmed that there were significant differences in mental health outcomes in both groups.

The third intervention, based on cognitive-behavioral therapy (CBT), including Cognitive-Behavioral Stress Management (CBSM) and the COPE-P program, was effective in reducing stress and depression, particularly among high-risk or minority pregnant women, highlighting the importance of cognitive restructuring and the application of adaptive coping strategies in psychological care during pregnancy (Li *et al.*, 2020; Jesse, 2016; Gennaro *et al.*, 2024). CBT interventions have also demonstrated benefits for pregnancy, as evidenced by the study of Erfiana & Fawziyah, (2022) which reported that Cognitive Behavioral Therapy (CBT) effectively reduced anxiety in second-trimester pregnant women. After the intervention, most participants felt calmer, slept better, and experienced less irritability or anxiety. These findings indicate that CBT can maintain positive thoughts and behaviors, enhance social functioning, and improve quality of life during pregnancy, making it an effective therapeutic strategy for managing anxiety in pregnant women.

The fourth intervention, which integrated spiritual values into health education, was also found to significantly reduce stress, anxiety, and depression, while improving physiological indicators such as blood pressure. This finding suggests that a spiritual approach can strengthen pregnant women's coping mechanisms in managing role changes and psychological pressures during pregnant (Sanaeinasab, 2020).

Social support, including partner involvement in lifestyle education interventions, also strengthens the effects of reducing depression and anxiety, while enhancing mother-child bonding. Kenyon, (2016) reported that children of mothers with depression are at risk of developing insecurity, behavioral problems, cognitive impairments, and emotional dysfunction, which can weaken the mother-child bond. Therefore, reducing maternal depression is expected to have significant long-term impacts on children, families, and society. Trial results showed that layperson support benefited mothers with ≥ 2 social risk factors in reducing depression, although the effect was not significant across the entire sample. Participants receiving the intervention demonstrated superior maternal infant bonding compared to those in the control group. These outcomes reaffirm the importance of social environmental involvement as a vital protective element in supporting the mental health of pregnant women (Kenyon *et al.*, 2016; Sanaati *et al.*, 2016).

Overall, health education programs designed with systematic and structured approaches while accounting for the psychological, social, and spiritual needs of expectant mothers have proven to be effective in mitigating stress, anxiety, and depressive symptoms. In addition, these interventions enhance self-efficacy, birth preparedness, and mother child relationship quality. Findings of the systematic review focus on

how crucial a multidimensional approach to psychological care during pregnancy is, where a combination of education, social support, and adaptive coping strategies plays a central role in maintaining mental health throughout pregnancy.

CONCLUSION

A review of 12 studies demonstrates that health education interventions effectively reduce stress, anxiety, and depression in pregnant women. Interventions included mindfulness, psychoeducation, cognitive behavioral therapy (CBT), spiritual approaches, and social or family support. Mindfulness has a positive impact on self-efficacy and emotional regulation, psychoeducational interventions and antenatal education can reduce fear of childbirth and improve birth preparedness, while CBT and culturally adapted strategies improve adaptive coping. Integrating spiritual values and partner involvement further strengthened maternal mental health and mother-child bonding. Overall, structured health education programs addressing psychological, social, and spiritual needs not only alleviate stress, anxiety, and depression but also enhance coping capacity and psychological well-being, underscoring the importance of multidimensional approaches in maternal health care.

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