

Prenatal Yoga for Mental Health: A Systematic Literature Review

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Abstract— Women will be proud if they enjoy their pregnancy process in a healthy condition both physically and psychologically. However, some pregnancy can trigger psychological problems in pregnant women. One of complementary therapies that can be practiced to maintain a healthy mental condition during pregnancy is prenatal yoga. Nevertheless, because of less parental knowledge and family support, only few people know about prenatal yoga. Thus, the issue of maintaining mental health of pregnant women still lacks. The purpose of this study is to determine the mental health conditions of pregnant women who have attended prenatal yoga and to determine the effectiveness of prenatal yoga on the mental health conditions of pregnant women. Using 7 steps to create Systematic Literature Review, 942 articles from one database (PubMed) were selected for critical appraisal. The articles were selected based on a quantitative method with a variety of designs. 12 articles that matched the variety criteria and considered as good were divided and mapped into several points namely fetal response, depression and stress, anxiety, complications, immunity, and self-efficacy. A discussion was made based on the research findings of the selected articles. Research suggests that prenatal yoga is safe and have many benefits for pregnant women and their babies. The benefit of prenatal yoga are improving nerve response from the pituitary gland to reduce cortisol levels, improving mood, inducing positive thinking, reducing anxiety, stress, and depression, and increasing the confidence of pregnant women from labor until the puerperium.

Keywords: *yoga, prenatal, complementary therapy, midwifery.*

I. INTRODUCTION

Pregnancy is a precious gift for a family [1], and the presence of a child is very much awaited [2]. A woman will be proud if she is able to enjoy her pregnancy process happily [3], and in healthy condition both physically and psychologically [4]. However, women are also vulnerable from complications or high risks during pregnancy. This can cause anxiety and even lead them to depression thus decreasing their mental and physical well-being [5].

Over time, antenatal care [6] for pregnant women continues to develop and focus comprehensively and holistically, both in rural areas and in urban areas [2]. This is the realization of "Sustainable Development Goal (SDG)" program that aims to reduce the incidence of mortality and morbidity in pregnant women [7]. Pregnant women often experience low back pain [8], hypertension [9], edema, anemia [10], and other discomforts that trigger the disruption of psychological condition and make them vulnerable to depression [11]. Some researches reported that

50% pregnant women in Indonesia experience depression [12], and impaired mental health [13]. 2% in the world [14] have experienced mental disorder caused by anxiety and depression [15]. Although the number seems small, it actually represents a large number and this has become a big problem especially for midwives in the attempt of reducing the incidence of morbidity and mortality on pregnant women [16]. In reality, many pregnant women still do not know about how to deal with mental disorder [17]. Meanwhile, health care providers, especially midwives [18] are often being passive in managing mental health [19].

Nowadays, there are complementary therapies developed and studied to improve mental and physical health of pregnant women such as prenatal yoga [20]. However, because of lack of knowledge and little support from family [21], not many women know about prenatal yoga [22]. Thus, the gap for improving mental health in pregnant women is still wide [23]. Healthy mind is associated with good physical health. Therefore, healthy pregnancy also starts from strong mental health. Based on this issue, we are interested to explore prenatal yoga and its effect toward mental health on pregnant women.

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II. METHOD

Articles were selected using keyword "Systematic Literature Review, Prenatal Yoga for Mental Health". The stages of systematic literature review were: 1) identification of problems, 2) frameworks making, 3) literature searching, 4) article selection, 5) critical appraisal, 6) data extraction, 7) data collection and maps creating to answer questions.

Problem Identification: Bodybuilding known as Yoga is growing rapidly [24]. In the past, Yoga was known as a thick Hindu religious culture [25], but over time, this practice is considered as a type of exercise that has many benefits. Indonesian Ulama Council (MUI) [26] on one of the three fatwas consider yoga as "makruh" meaning that yoga is pure type of exercise without any Hindu spiritual elements [27], meditation [13], and mantra. There are various types of yoga, each with different benefits including yoga for pregnant women or known as Prenatal Yoga [20].

Prenatal Yoga [28] has been adapted for the safety and comfort of pregnant women. Trainer or practitioners who teach this bodywork are called Yogis [29]. There are many benefits of prenatal yoga such as improving mental health of pregnant women. Strong mental health is essential for everyone including pregnant women [30]. Pregnant women, especially nulliparous or primigravid, must be provided with good family support [31], a lot of knowledge about the process of pregnancy [32], childbirth, and postpartum, so that both mother's mind and soul are ready to face any problems or complications that can occur at any time [33]. Depression or stress experienced by pregnant women can disrupt their minds and health conditions [34]. Therefore, to prevent depression and other mental health problems, pregnant women can practice or apply some exercises or therapies such as prenatal yoga [35]. It is hoped that this new complementary therapy will contribute to the reduction of morbidity and mortality of pregnant women [36].

Literature searching: The steps of systematic Literature Review were as follows:

1. Making the framework as a basis for determining inclusion and exclusion criteria so that the data searching only focus on the context.
2. Developing keywords that are relevant with the framework.
3. Entering these keywords into the search engine in the PUBMED database. The PUBMED database also has some filters to get the most accurate result such as Full-Text filtering, Data Publish 10 years ago, Human, and English.
4. Recording the database findings where 942 articles were collected.
5. Saving the database page to the Zotero bibliography storage engine. In Zotero, the data were inputted in a folder.
6. The stored data were filtered according to the framework. Unsuitable articles were removed from the "relevant" folder.
7. Noting the findings of the number of articles. The screening process is presented in the Prism Flow Diagram below.

TABLE 1. FRAMEWORK

Element	Inclusion	Exclusion	Rationale
Population	Pregnant Yoga pregnancy Prenatal yoga	Pregnant women who have a disability	
Exposure/Event	Mental health Mindfulness Depression stress		Nulliparous Primigravida Multigravida
Outcomes	Effectiveness of mental depression		
Study Design	Case-control; Cross Sectional; RCT Cohort Experiment		Quantitative method

The following framework is a reference for inclusion and exclusion criteria in Table 1.

It was 22 articles about the effectiveness of prenatal yoga passed the critical appraisal. These studies used quantitative research methods with various types of study designs such as quasi-experiment, case-control, randomized control trial (RCT), and cross-sectional. The articles were further assessed using a checklist or tools from Joanna Briggs. After the selected articles have passed the critical appraisal process, 12 articles of good quality were indexed Scopus with standards Q1 and Q2. The selected and filtered articles are presented by the prism and the data extraction in Table II.

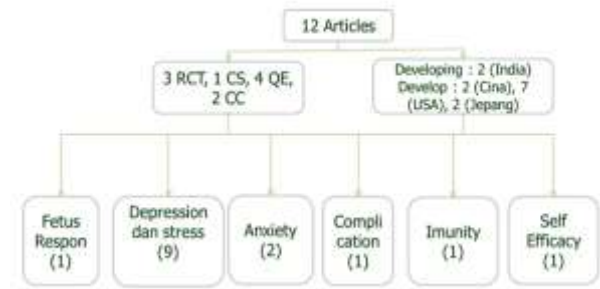
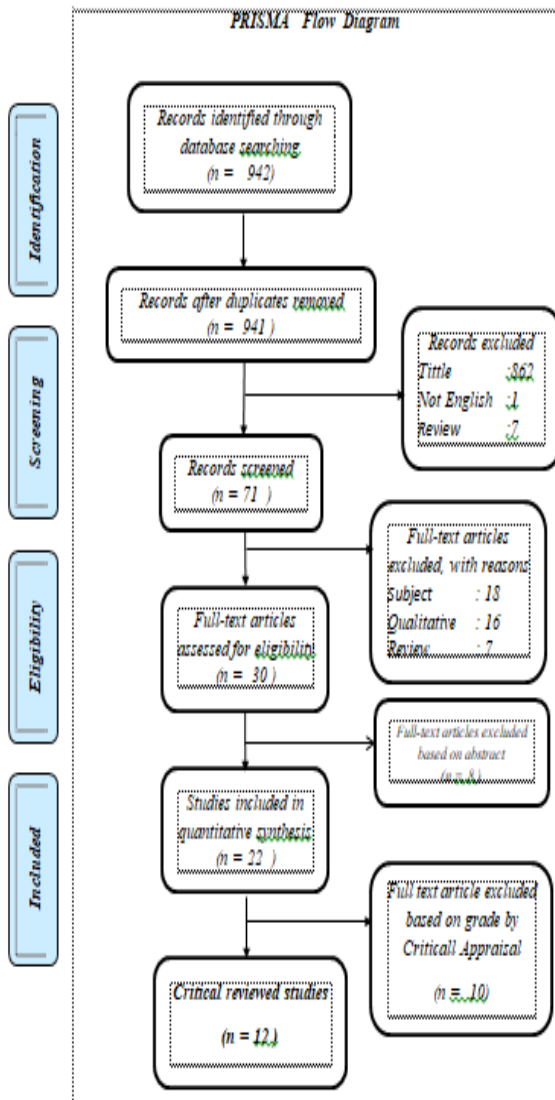


Fig 2. Mapping

Data Extraction: After obtaining articles that matched the topic, the data were extracted. The 12 articles obtained were extracted to include key criteria such as research location, research population, research objectives, methodology, and findings or recommendations.

Mapping: Based on the 12 articles that have been selected and considered as good quality, the data were extracted into several points such as research objectives, research design, number of samples, and results or findings of the study.

Fig 1. PRISM Flow chart

TABLE II. THE SELECTED AND FILTERED ARTICLES

NO	TITLE/ AUTHOR/ YEAR/ LEVEL/ COUNTRY/ JOURNAL	AIM	DESIGN	SAMPLE/SIZE	RESULT
1	Acute Fetal Behavioral Response to Prenatal Yoga a Single, Blinded, Randomized Controlled Trial (TRY Yoga)/Babbar, S. Hill, J. Williams, K. Pinon, M. Chauhan, S. Maulik, D/2016/Q1/Kansas, USA/American Journal of Obstetrics and Gynecology	This study aims to detect the changes in maternal and fetal responses after prenatal yoga practice using a general standard test to assess maternal and fetal well-being.	RCT	A single, blind, and randomized controlled trial was conducted involving pregnant women who did not have complications between 28 and 36 weeks of gestation with normal single fetus, did not smoke, or have previous experience with yoga. The sample size were two groups of 46 people.	There is no significant change in acute fetal blood flow after practicing prenatal yoga for the first time in pregnancy.
2	A Randomized Controlled Trial Of Yoga For Pregnant Women With Symptoms Of Depression And Anxiety/Davis, K. Goodman, S. H. Leiferman, J. Taylor, M. Dimidjian, S/2015/Q1/Colorado, USA/Complementary Therapies in Clinical Practice	This study aims to examine the feasibility of prenatal yoga as an intervention for pregnant women with depression and anxiety symptoms.	RCT	A total of 46 pregnant women with depression and anxiety symptoms were assigned to 8-weeks prenatal yoga intervention and only treatment as usual (TAU).	Prenatal yoga i found to be a proper intervention, reducing symptoms of anxiety and depression. However, prenatal yoga was only significant in surpassing TAU in reducing negative effects.
3	Effect Of Integrated Yoga On Anxiety, Depression & Well Being In Normal Pregnancy/Satyapriya, M. Nagarathna, R. Padmalatha, V. Nagendra, H. R./2013/Q1/Bengaluru, India/Complementary Therapies in Clinical Practice	This study aims to identify the effect of integrated yoga on pregnancy experience, anxiety, and depressions in normal pregnancy. RCT	RCT	There were 6 normal pregnant women in 20-weeks gestation involved in this study. The yoga group (n=51) practiced yoga and the control group (n =45) did standard antenatal care (ANC) an hour every day for 20 until 36 gestation weeks.	Yoga can reduce anxiety, depression, and uncomfortable experiences during pregnancy. and
4	Potential For Prenatal Yoga To Serve As An Intervention To Treat Depression During Pregnancy/Battle, C, L. Uebelacker, L, A. Magee, S, R. Sutton, K, A. Miller, I, W./2015/Q1/USA/Women's Health Issues	This study examined the acceptability and feasibility of prenatal yoga intervention, as a strategy for treating depression during pregnancy.	Cross-Sectional	This study involved 34 pregnant women with 12 until 26 weeks gestational age, single pregnancy, more than 18 years old, speak English fluently, and not experiencing any depression and/or anxiety disorder at the moment.	This study shows that prenatal yoga is a viable approach to treat antenatal depression, and it could be accepted as new therapy.

NO	TITLE/ AUTHOR/ YEAR/ LEVEL/ COUNTRY/ JOURNAL	AIM	DESIGN	SAMPLE/SIZE	RESULT
5	The Effects Of Mindfulness-Based Yoga During Pregnancy On Maternal Psychological And Physical Distress/Beddoe, A, E. Paul Yang, C, Po. Kennedy, H, P. Weiss, S, J. Lee, K, A./2009/Q2/SF, USA/JOGNN - Journal of Obstetric, Gynecologic, and Neonatal Nursing	This research examined the acceptability and feasibility of prenatal yoga intervention during pregnancy and to collect early databases about the usefulness of this intervention for reducing complication pregnancy damage	Quasi Experiment	This study recruited 16 healthy nulliparous pregnant women, singleton pregnancy, with 12 and 32 weeks gestation.	Women who practiced yoga in the second trimester reported significant reduction in physical pain compared to women in the third trimester whose pain increased. However, pregnant women in their third trimester showed a greater reduction in perceived stress and anxiety.
6	Effects Of Prenatal Yoga On Women's Stress And Immune Function Across Pregnancy: A Randomized Controlled Trial/Chen, P, J. Yang, L. Chou, C, C. Li, C, C. Chang, Y, C. Liaw, J, J. Bailowitz, Z. Grams, R. Teeple, D. Hew-Butler, T./2017/Q1/Taipei/Clinical Journal of Sport Medicine	The aim of this research is to compare the changes in stress and immunity between pregnant women that receive prenatal yoga and those only receiving regular prenatal care.	Quasi Experiment	This study recruited 94 healthy pregnant women at 16 weeks gestation through convenience sampling from a prenatal clinic in Taipei.	Prenatal yoga significantly reduced stress in pregnant women and improved their immune function.
7	Immediate Stress Reduction Effects Of Yoga During Pregnancy: One Group Pre Post Test/Kusaka, M. Matsuzaki, M. Shiraishi, M. Haruna, M./2016/Q1/Tokyo, Japan/Women and Birth	This research aims to determine the direct effects of yoga on stress response during pregnancy.	Quasi Experiment	This study analyzed 44 and 35 women at time 1 and time 2 from gestational age between 18 and 21 weeks to birth.	The result of this research showed that there was a direct effect of prenatal yoga in reducing stress during pregnancy.
8	Effects Of A Prenatal Yoga Programme On The Discomforts Of Pregnancy And Maternal Childbirth Self-Efficacy In Taiwan/Sun, Y, C. Hung, Y, C. Chang, Y. Kuo, S, C./2010/Q1/Taiwan/Midwifery	This study aims to evaluate yoga programs provided for primigravida in the third trimester of pregnancy with the aim of reducing the discomfort that occurs during pregnancy and increasing labor independence.	Quasi Experiment	This study included 88 individuals divided into two groups; 43 people in the control group and 45 people in the experimental group who took part in a prenatal yoga program.	Providing books and videos about yoga during pregnancy could contribute to reducing discomfort during pregnancy and increasing self-independence in the process of childbirth.

NO	TITLE/ AUTHOR/ YEAR/ LEVEL/ COUNTRY/ JOURNAL	AIM	DESIGN	SAMPLE/SIZE	RESULT
9	Effect Of Integrated Yoga On Stress And Heart Rate Variability In Pregnant Women/Satyapriya, M. Nagendra, H. R. Nagarathna, R. Padmalatha, V./2009/Q2/Bangalore, India/International Journal of Gynecology and Obstetrics	This study aims to study the effect of integrated yoga practice and guided yoga relaxation by instructors on stress and autonomic responses in healthy pregnant women.	Case-Control	Pregnant women aged 20 to 35 years and with gestational age between 18 and 20 weeks of pregnancy were randomly selected and divided into yoga groups or control groups.	Yoga can reduce stress and improve adaptive autonomic response of healthy pregnant women
10	The Effect Of Prenatal Hatha Yoga On Affect, Cortisol And Depressive Symptoms/Bershadsky, S. Trumpfheller, L. Kimble, H. B. Pipaloff, D. Yim, I. S./2014/Q1/California, USA/Complementary Therapies in Clinical Practice	The objective of this research is to examine the direct effect of prenatal yoga on depression and its impact towards pregnancy, fetus, and postpartum processes.	Case-Control	51 pregnant women were divided into 2 groups namely intervention group and control group.	The results of this study indicate that prenatal Hatha yoga could improve mood and effectively reduced symptoms of depression until the postpartum period.
11	Yoga And Social Support Reduce Prenatal Depression, Anxiety And Cortisol/Field, T. Diego, M. Delgado, J. Medina, L./2013/Q1/Miami, USA/Journal of Bodywork and Movement Therapies	The purpose of this study was to compare the effects between yoga (physical activity) and social support (verbal activity) in prenatal and postpartum depression.	Case-Control	Ninety-two depressed pregnant women at 22 weeks gestation were randomly selected and assigned for yoga and social support.	At the end of the first and last session, yoga groups reported experiencing a decrease in depression, anxiety, anger or mood, back pain and swollen feet compared to the social support group. In addition, the cortisol levels in both groups decreased after each session. Estrinol and progesterone levels also decreased after the last session.
12	Yoga And Massage Therapy Reduce Prenatal Depression And Prematurity/Field, T. Diego, M. Hernandez-Reif, M. Medina, L. Delgado, J. Hernandez, A./2012/Q1/Miami, USA/Journal of Bodywork and Movement Therapies	This study aims to compare the relative effects of prenatal yoga, massage therapy, and standard prenatal care in depressed pregnant women and prematurity.	Case-Control	Eighty-four depressed pregnant women were randomly selected and assigned to yoga, massage therapy, or antenatal care (ANC).	In this study, the yoga and massage therapy groups had greater decrease on depression, anxiety, and back and leg pain. Although the results on neonatal births between the therapy groups were not different, there was significantly greater increase in birth weight and gestational age than the control group.

III. RESULT

a. Prenatal Yoga for Fetal Response

1 finding from article [37] explained the effectiveness of prenatal yoga towards fetal response. The finding suggests that there was no significant fetal responses including fetal heart rate (FHR) and blood flow to the veins and umbilical arteries in pregnant women that attended prenatal yoga program for the first time. There was no significant change in fetal heart rate as shown by the constant value. There was no significant change in the blood flow that supply nutrients to fetus either. It probably occurred because the assessment was conducted only in the first time yoga practice. The intervention in both groups only involved one yoga class for one hour.

b. Yoga Prenatal for Depression and Stress

The effectiveness of prenatal yoga for depression was found in six articles. The first article [38] stated that prenatal yoga was a feasible and acceptable application for pregnant women. Subsequent articles from [39] explained that prenatal yoga reduced stress and improved autonomic nerve responses [40]. In the article [41], Hatha yoga has been shown to improve mood in pregnant women up to postpartum. The next article from [42] explained that prenatal yoga were shown to reduce depression, anxiety, anger, back and leg pain or low back pain in the intervention group compared to those in control group. Meanwhile, the articles from [43] explained that there was no difference effect between group that follow yoga and massage therapy. [29].

c. Prenatal Yoga for Anxiety

The perceived benefits of prenatal yoga on anxiety in pregnant women were found in two articles. Article [44] suggests that prenatal yoga could reduce anxiety and discomfort during pregnancy rather than just doing regular antenatal examinations [45]. Uncomfortable experiences makes pregnant women anxious. Practicing prenatal yoga could reduce anxiety and uncomfortable experiences in pregnant women [46].

d. Prenatal Yoga for Complications

Complications that can occur in pregnancy are feared by pregnant women. The finding of a study reported that routinely practicing prenatal yoga could reduce physical pain in the second trimester thus significantly reduced fear in the third trimester [47].

e. Prenatal Yoga for Immunity

Several articles suggest that prenatal yoga could improve the body's immunity. Therefore, pregnant women can feel healthier and stronger [48].

f. Prenatal Yoga for Self-Birth Independence

Pregnant women who are depressed or experienced anxiety disorders might feel disturbed and helpless [49]. A study showed that respondents who were given prenatal yoga video in the form of compact disks and routinely

performed it 2 to 3 times a week reported a decreased anxiety and improved body condition. This made the respondents confident and more independent in the process of pregnancy and preparation of labor [50].

IV. DISCUSSION

Pregnancy is the result of fertilization process between sperm and ovum where the fetus is expected to grow and develop normally. Pregnant women generally have the same physiological condition. However, as each person is different, the development of fetus might be different between individual. Besides physical health, mental health is also an important factor that needs to be observed and considered in pregnant women [39].

Physiological reversal phenomena of pregnancy and complication during the 1st trimester to 3rd trimester such as the threat of abortion, low birth weight (LBW), lack of chronic energy (KEK), fatigue, back pain or low back pain (LBP), insomnia, edema in the legs, or even complications in the socio-economic environment, induce feelings of discomfort in pregnant women and because of that, they might feel helpless. The discomfort that occurs in pregnant women can be reduced by doing prenatal yoga. The researcher provided participants with booklet on prenatal yoga movements and 30 minutes video continued by regular follow up via telephone to the respondents. Different types of movements such as the pyramid, wide-leg squats, circular arms and shoulders, widening chest cavity, stretching pelvic muscles, strengthening back muscles, relaxation, and meditation were performed three times a week from 12-14 weeks gestation. These exercises proved to be able to reduce pregnancy discomfort and increase self-independence in the labor process [50].

Discomfort during pregnancy can induce anxiety, depression, and helpless feeling. A study that measured blood flow velocimetry and uterine artery Doppler using ultrasound showed that third trimester pregnant women who practiced prenatal yoga had significant results ($p < 0.001$). This indicates a decreased anxiety as evidenced by better adaptation of autonomic nerves during pregnancy [46].

Depression and anxiety during pregnancy are main health problems. Pregnant women who are at risk of depression will continue to feel it until the postpartum period. This study [44] showed that integrative complementary practices such as prenatal yoga were acceptable as option to treat depression and anxiety or so-called mental disorders. Participants in this study reported that they felt less anxious and depressed rather than that at the beginning of treatment. There was also a decrease in the incidence of preterm birth and spontaneous abortion on national figures.

Stress that appears in pregnancy can be determined based on the cortisol levels in the body. This research found that the level of cortisol in pregnant women [51] increased two to three times in their third trimester. Premature birth and

pain during labour can also increase the cortisol levels in the body. Therefore, pregnant women are very vulnerable to mental disorders [52]. Practicing yoga during pregnancy can overcome psychological and physical discomfort, form positive thoughts, and improve mental health. The result of the research produced a value of $p = 0.05$ thus proving that prenatal yoga reduced psychological distress in pregnant women [47].

Another study revealed that there was 32% relaxation improvement in yoga group compared with that of control group, proving that yoga could reduce prenatal stress. Besides reducing stressor, careful prenatal yoga in second and third-trimester pregnant women also increases mental health levels and is a cost-effective and feasible therapy [42]. A study that examine the benefits of Hatha Yoga also showed that there was a decrease in depression and cortisol in pregnant women who practiced it. Cortisol is closely related to pituitary gland that controls emotional status (mindfulness) so anxiety, depression, and stress are influenced by the level of cortisol [41]. This research [40] also found that there was a significant decrease of 31.6% in the yoga group consisting of 45 pregnant women with 20 to 36 weeks gestational age. Exercises lead to stable heart rate in pregnant women.

A research that compared prenatal yoga with other complementary therapy namely massage therapy found out that there was no difference in the effect of reducing depression. In other words, both therapies could reduce depression as proved by a value of ($p < 0.001$). In this study of yoga and massage therapy, sessions began after 12 to 32 weeks of pregnancy for 20 minutes in each session [43]. Associating prenatal yoga with mindfulness or emotional status [53], studies from [38] showed that emotional status was significantly higher ($p < 0.05$). Decreasing sensitivity and negative thoughts can regulate emotions and reduce depression. Therefore, a pregnant woman who is dealing with problems, is expected to maintain her mind, focus on positive thoughts [29], because it will benefit her from final trimester to postpartum.

Related to immune system or immunity, a study [49] found that pregnant women with 16 to 36 weeks gestational age who practiced prenatal yoga had their cortisol levels in saliva decreased, levels of Ig A increased, and in control group A increased only at 36 weeks gestation. These results indicate that prenatal yoga could significantly reduce stress and strengthen the body's immunity for a long term. Decreased levels of cortisol in saliva effectively reduce stress [48] and in relation to fetal response, there was no significant result on the effectiveness of prenatal yoga [37].

Results of research and studies should be discussed in terms of interpreting it from the perspective of previous studies and of the working hypotheses. Findings and implications should also be discussed in the broadest context [54]. Suggestion for future research may also be highlighted.

V. CONCLUSION

Pregnant women often experience mood swings that can lead to anxiety, depression, and stress. Complementary therapies such as prenatal yoga can act as a preventive means to improve the mental health of pregnant women.

Prenatal yoga has many benefits for pregnant women, namely improving the response of nerves and pituitary gland to reduce cortisol level, improving the mood. Good mood will lead to positive thoughts, decreased anxiety, stress, and depression. Thus, it can increase the independence of pregnant women and their readiness to undergo labor until the puerperium.

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