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Efficacy of Yoga Exercise to Reduce Anxiety in Pregnancy: A Meta-Analysis using Randomized Controlled Trials

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ABSTRACT

Background: Anxiety can have a negative impact on mothers and infants. Anxiety can cause prematurity, impaired motor development, mental and emotional development of children. This study aimed to examine efficacy of yoga on reducing anxiety in pregnant women.
Subjects and Method: This was a meta-analysis. As many as 6 randomized control trials (RCT) were extracted from Pubmed, Science Direct, Springer, Proquest, and Cochrane databases. A sample of 426 pregnant women who took yoga exercises for 4-12 weeks was selected for this study. The data were analyzed in RevMan 5.3.
Results: Yoga exercise reduce anxiety in pregnant women (SMD= -0.48; 95% CI= -0.92 to -0.03; p= 0.030).
Conclusion: Yoga is effective to reduce anxiety in pregnant women.

Keywords: Yoga exercise, anxiety, pregnant women, randomized control trials, meta-analysis

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BACKGROUND

Yoga is a type of physical exercise, including body and mind therapy that combines physical posture (Asana), breathing techniques (Pranayama), and meditation or relaxation during the last decade, yoga is quickly becoming a choice of physical training and relaxation exercises main for pregnant women (Field et al., 2013; Jiang et al., 2015; Babbar and Shyken, 2016). Yoga is an effective complementary therapy for dealing with anxiety and depression in pregnancy (Deligiannidis and Freeman, 2014; Ryan, 2013). Pregnant women who have psychological problems prefer complementary therapy to pharmacological therapy because they have minimal and easy side effects to do (Labor and Maguire, 2008; Deligiannidis and Freeman, 2014;). During the past decade, yoga has quickly become an exercised choice and the main relaxation exercise for pregnant women (Jiang et al., 2015).

Physical activity can reduce stress and improve health. Yoga is generally used as a stress management therapy that involves humans as a whole, and is more often chosen as a therapy for anxiety or depression compared to pharmacological therapy or conventional medicine because there are no side effects and has more benefits (Pascoe & Bauer, 2015).

Depression and anxiety during pregnancy are the main problems of public health. Anxiety during pregnancy often occurs along with depression during pregnancy (Davis et al, 2015). Depression and anxiety during pregnancy can affect mother and baby. If it is not treated immediately, it will cause problems including causing labor

pain, preterm birth, prolonged labor, caesarean delivery, low birth weight babies (LBW), and post partum depression that can cause developmental disorders in children (Beevi et al., 2016; de la Fe Rodríguez-Muñoz, et al., 2017; Deligiannidis and Freeman, 2014; Madhavanprabhakaran et al., 2015).

There is a lot of research that has been done regarding the effectiveness of yoga to overcome anxiety and depression in pregnancy. Based on research that has been done, yoga in pregnancy has been shown to be effective in dealing with anxiety and depression during pregnancy. Based on research conducted by Field et al. (2012) on 84 pregnant women with depression who were taken by randomized control trial (RCT), the results of the study found that yoga can significantly reduce anxiety and depression in pregnant women doing yoga ($p < 0.001$) compared with a control group that carries out Antenatal care in general. The results of this study are supported by research conducted by Yulianti, et al. (2018) on 102 pregnant women who were RCT with the results of yoga studies significantly effective in reducing anxiety and depression in trimester II and III pregnant women ($p < 0.001$).

Yoga treatment is associated with a significant decrease in cortisol levels. Those who do yoga as a therapeutic treatment show a significant relationship to reducing cortisol levels and antidepressant responses (Thirthalli et al., 2013). Anxiety and depression are responses to stress that a person feels (Satyapriya et al, 2013). In the cause of acute stress that occurs is an increase in catecholamine and cortisol, the higher the severity of stress the higher the levels of these two hormones (Lisdiana, 2012).

Many studies have proven that yoga is effective in dealing with anxiety in pregnancy. Therefore, it is necessary to conduct a meta-analysis as a systematic review with statistical techniques to calculate the conclusions of some study.

SUBJECTS AND METHOD

This was a meta-analysis. The study was conducted by searching for and selecting the results of research that had been conducted throughout the world, the time of the results of the studies to be selected was in the period of 2008-2018. Study data was sought through several indexes, including: Pubmed, Science Direct, Springer Link, Proquest, and Cochrane. The results of the study will be analyzed using special meta-analysis software, RevMan. Searching for relevant literature through databases or indexing that researchers have chosen by using search keywords (keywords) include "yoga AND pregnancy", "yoga and prenatal", "yoga AND anxiety", "yoga AND randomized control trial".

Inclusion Criteria

Full paper articles with randomized control trial, single or double blind RCT, the intervention given is Yoga and the research subjects are all pregnant women.

Exclusion Criteria

The study subject was pregnant women with complications, interventions for hypnotherapy, music therapy, acupuncture, massage, antidepressants, published articles other than in English.

Study Variables

The dependent variable was anxiety. The independent variable was yoga.

Operational Definition of Variables

Yoga is a physical activity of body and mind therapy that combines physical posture (Asana), breathing techniques (Pranayama), and meditation or relaxation performed by women during pregnancy.

Anxiety was defined as a feeling felt by women during pregnancy, reflecting fear of health, baby's welfare, experienced

health services, ability to carry out pregnancy and childbirth and its effects, and care or role as a mother. Measuring of the anxiety is done by using the The State-Trait Anxiety Inventory (STAI) questionnaire, the Hamilton Rating Scale For Anxiety (HARS) from published articles with a continuous measuring scale.

Statistical Analysis

The results of the study were analyzed using special meta-analysis software namely Review Manager 5.3 (RevMan) and used the Random Effect Model (REM) analysis model or Fixed Effect Model (FEM).

RESULTS

A total of 213 articles were identified through database search. Furthermore, the multiple data selection has been carried out and based on predetermined inclusion criteria, 6 filtered articles are carried out by meta-analysis (Figure 1.)

Based on the results of the analysis (Figure 2), the results of the heterogeneity test obtained p values which is<0.0001 and (I2) of 81% so that the meta-analysis model of Random Effect Model (REM) was used. If heterogeneity with a value of p <0.05 or I^2>50%, the meta-analysis model with Random Effect Model (REM) is used (Murti, 2018). The analysis found that pregnant women who did yoga significantly decreased anxiety by 0.48 times better than pregnant women who were not doing yoga (Std. Difference Mean = -0.48, 95% CI = -0.92 to -0.03, p = 0.03) (Figure 2).

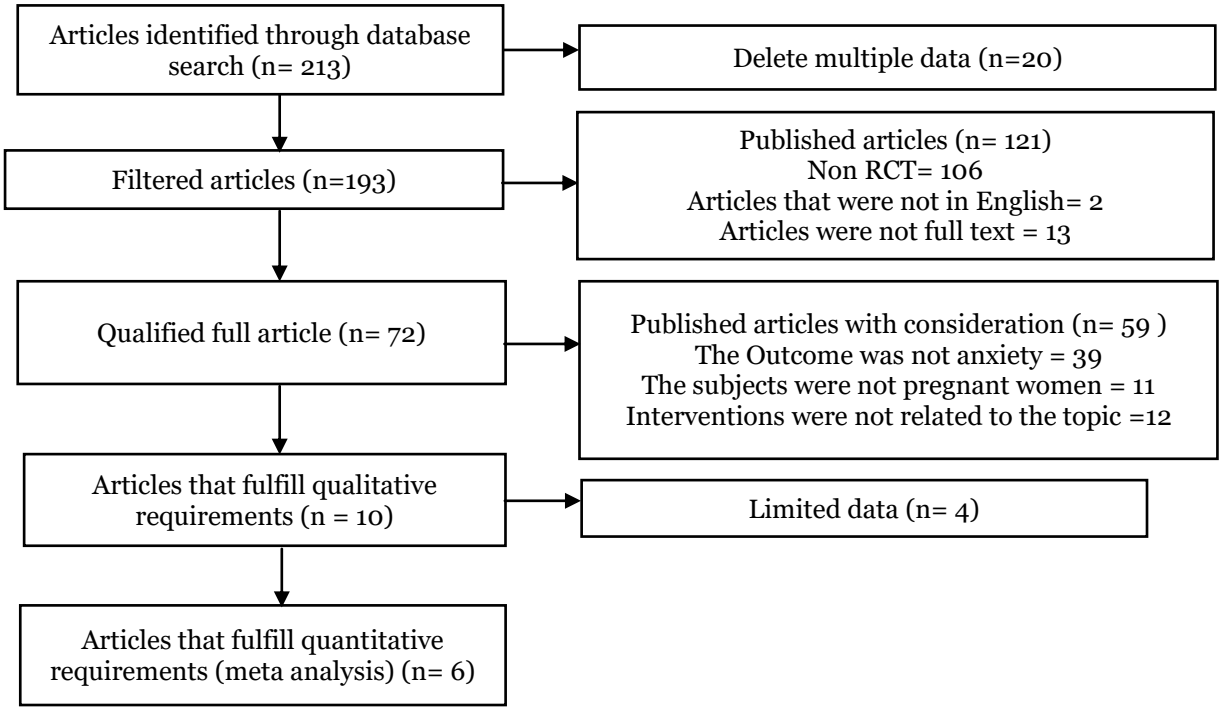


Figure 1. Plot chart of the review process

The measurement scale was continuous that used calculations based on standard score of mean difference. The mean score used was the mean change score. The score of the Standard Deviation (SD) used was the score of SD change. The Corr

(Coefficient Correlation) score can be used to calculate SD change based on previous research (Higgins and Green, 2011). Based on previous research, the score of Corr (Coefficient Correlation) used was 0.6, which was used to calculate SD changes during intervention (Gong et al, 2015; Daley et al, 2015) (Figure 2).

Table 1. Summary source of yoga effectiveness in reducing anxiety

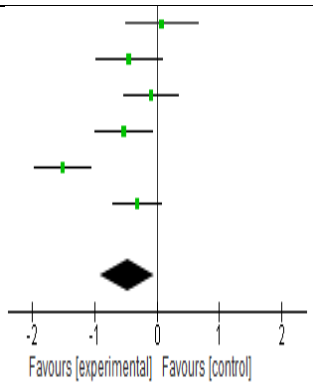
Author and year	Total follow-up	Age range of pregnancy (weeks)	Inclusion criteria	Intervention (I) and Comparative (P)	Intervention duration
Davis et al. (2015)	46	28	Pregnant women aged 18-45 years old, pregnancy age ≥ 28 weeks, EPDS score ≥ 9, STAI score ≥ 25 and/or ≥ 35, joining physical activities such as yoga or martial art for ≤60 minutes / week, speak English, and are willing to take yoga classes every week.	I: Yoga P: TAU (Treatment as Usual)	8 weeks
Field et al. (2013a)	79	22	Pregnant women with depression measured by the Structured Clinical Interview for Depression (SCID) in the first session, pregnant women with one child	I: Yoga P: Social Support	12 weeks (1 time/ week)
Field et al. (2013b)	75	22	Pregnant women with one child, no complications of pregnancy, age ≤ 40 years old, did not consume drugs that could affect cortisol levels, attended diagnostic criteria for (SCID)	I: Yoga P:standar antenatal care	12 weeks (1 time/ week)
Field et al. (2012)	28	18-22	Pregnant women aged ≥18 years old, primipara, normal or uncomplicated pregnancies, diagnosed with depression based on criteria (SCID)	I: Yoga P:Standar antenatal care	12 weeks (2 times/ week)
Satyapriya et al. (2013)	96	18-20	Pregnancy between 18-20 weeks, primigravida, multigravida with one child born alive. Pregnant women without complications or normal pregnancies	I: Yoga P:Standar antenatal exercise	1 month (3 times/ weeks)
Yulianti et al. (2018)	102	12- ≥28	Trimester 2 and 3 pregnant women without complications	I: Yoga P:Not treated	4 weeks

The total score used was the total number of research subjects. The research subjects were determined according to the total number of study subjects in each of the previous experimental groups and control groups (Higgins and Green, 2011) (Figure 2).

Figure 2. Forest plot of yoga effectiveness in reducing anxiety

	Yoga			Control				Std. Mean Difference	Std. Mean Difference
Study or subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Davis et al, 2015	-2.07	10.32	23	-2.91	11.25	23	15.3%	0.08 [-0.50, 0.65]	
Field et al, 2012	-7.4	8.67	28	-3.42	8.75	28	15.9%	-0.45 [-0.98, 0.08]	
Field et al,2013a	-6.7	7.58	40	-6	7.27	39	17.1%	-0.09 [-0.53, 0.35]	
Field et al,2013b	-8.1	7.73	37	-3	10.83	38	16.9%	-0.54 [-1.00, -0.07]	
Satyapriya et al,2013	-5.59	5.87	51	3.27	5.77	45	16.9%	-1.51 [-1.97, -1.05]	
Yulianti et al, 2018	-0.31	3.68	51	0.8	3.3	51	17.8%	-0.32 [-0.71, 0.08]	
Total (95% CI)			230			2224	100.0%	-0.48 [-0.92,-0.03]	

Heterogenity Tau²= 0.25; Chi² = 26.79, df= 5 (p<0.0001); I² = 81%



DISCUSSIONS

Meta analysis result showed by forest plot showed that pregnant women who did yoga significantly were 0.48 time more likely to experience decreased anxiety compared to pregnant women who did not do yoga (SMD= -0.48, 95% CI= -0.92 to -0.03, p= 0.03).

Based on previous studies, more than 70% research results showed that Yoga can significantly overcome stress and anxiety symtomps (Brenes et al., 2018). The result of this study was supported by Newham et al. (2014), which showed that yoga can significantly reduce the anxiety in pregnant women (p<0.001). The effect of reducing this level of anxiety recurred at each session and the last yoga session was significantly lower than the first yoga session. Yoga was more effective than regular antenatal care in dealing with specific anxiety problems in nulliparous and low-risk pregnant women.

The result of a study done by Satyapriya et al. (2013) showed that yoga can significantly reduce the anxiety in pregnant women (p<0.001). The anxiety felt by the research subjects (pregnant women) in the experimental group or those who did yoga decreased to 15.65%, while anxiety in the control group increased to 5.02%.

The result of a study done by Davis et al. (2015) showed that yoga can be an intervention for pregnant women who experienced symptoms of depression and anxiety that were safe, acceptable, and feasible to apply. Pregnant women who joined yoga classes (in the experimental group) have a higher level of satisfaction and better improvement of anxiety symptoms than the control group.

The result of a study done by Yulianti et al. (2018) showed that yoga can reduce the anxiety in pregnant women. Yoga has a great effect in reducing anxiety both at 1st and 2nd follow-up at 83% and 79%. Based on previous studies, more than 70% of the results of the study found that Yoga can significantly overcome the symptoms and

anxiety (Brenes et al., 2018). The result of a study done by Satyapriya et al. (2013) which showed that yoga can significantly reduce the anxiety in pregnant women with p<0.001. Anxiety felt by study subjects (pregnant women) in the experimental group or those who did yoga decreased to 15.65%, while anxiety in the control group increased to 5.02%. Yulianti et al. (2018) stated that yoga can reduce anxiety in pregnant women. Yoga has a great effect in reducing anxiety both at 1st and 2nd follow-up at 83% and 79%.

Yoga was a body and mind exercise (Mind-body practice) which included physical posture (Asana), breathing (Pranayama), and meditation (Field et al., 2013; Babbar and Shyken, 2016). Yoga was a complete system and can be applied to all aspects of life, including pregnancy and childbirth. Practicing yoga involved practices that were calming or relaxing, contemplative, and meditative, which were through every movement or physical posture (Asana) and breathing exercises (Pranayama) (Shindu, 2014).

Every component in yoga played a role in reducing stress, anxiety, and depression. Yoga posture (Asana) has a positive correlation between the increase in brain gamma amino butyric acid (GABA) levels and improvement in mood and anxiety scores (Joshi and Sousa, 2014). Factors that reduce anxiety during meditation were increasing parasympathetic activity, decreasing locus ceruleus firing with reduced noradrenaline, increasing GABA, increasing serotonin, and decreasing cortisol hormone levels (Joshi & Sousa, 2014).The breathing technique in yoga (pranayama) used deep breathing techniques that can activate the parasympathetic nerves especially by stretching the lung tissue and vagal nerves as well as decreesing heart rate, blood pressure, metabolism, and oxygen consumption (Babbar and Shyken, 2016).

Pregnant women who did yoga during pregnancy have lower cortisol levels and higher positive effects than those who did not do yoga. Yoga provided psychophysiological benefits during pregnancy which can also be beneficial for the welfare of the mother during the postpartum period (Berhadsky et al, 2014).

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