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Effectiveness Yoga to Improve The Quality of Sleep in Pregnant Women with Nausea and Vomiting

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ABSTRAK

Lebih dari separuh wanita hamil yang merasa tidak nyaman karena mual dan muntah dilaporkan telah mengalami gangguan tidur selama kehamilan. Durasi tidur yang tidak memadai dan kualitas tidur yang buruk selama kehamilan dapat meningkatkan kehamilan dengan risiko, termasuk gangguan pertumbuhan janin, dan depresi pascapersalinan. Yoga umumnya digunakan untuk relaksasi dan terbukti efektif untuk mengurangi stres dan kecemasan pada wanita hamil sehingga dimungkinkan untuk meningkatkan kualitas tidur bagi wanita hamil. Salah satu bentuk latihan yoga pada ibu hamil adalah pranayama dan postur yoga restoratif. Tujuan dari penelitian ini adalah untuk mengetahui apakah pranayama dan postur yoga restoratif efektif untuk meningkatkan kualitas tidur pada wanita hamil. Studi quasy eksperimental dengan kelompok kontrol ini dilakukan pada 58 wanita hamil dengan mual muntah yang didapatkan dengan metode purposive sampling. Responden dibagi menjadi dua kelompok, 29 responden di setiap kelompok. Pranayama dan postur yoga restoratif diberikan pada kelompok intervensi dalam 30 menit selama 7 hari terus menerus. Kualitas tidur diukur oleh *Pittsburgh Sleep Quality Index* (PSQI). Hasil analisis data menggunakan uji Chi-Square menunjukkan bahwa tidak ada perbedaan dalam skor kualitas tidur ibu hamil sebelum dan sesudah diberi pranayama dan postur yoga restoratif ($p>0.05$). Wanita hamil trimester kedua dan ketiga yang mengalami mual dan muntah dalam penelitian ini tampaknya tidak mengalami peningkatan kualitas tidur setelah melakukan pranayama dan postur yoga restoratif. Frekuensi dan keteraturan dalam melakukan yoga menjadi poin penting yang perlu diperhatikan untuk hasil yang lebih baik.

Kata-kata kunci: kualitas tidur, wanita hamil, mual muntah, yoga

ABSTRACT

More than half of pregnant women that feel discomfort because of nausea and vomiting pregnancy (NVP) report have been disturbed sleep during pregnancy. Insufficient sleep duration and poor sleep quality during pregnancy may increase the risk of adverse pregnancy outcomes, including growth restriction of the fetus, and postpartum depression. Yoga is commonly used for relaxation and is proven effective to reduce stress and anxiety in pregnant women so that it is possible to improve the quality of sleep for pregnant women. One form of yoga practice in pregnant women is pranayama and restorative yoga postures.Sothis study aims to find out whether pranayama and restorative yoga postures effective to improve the quality of sleep in pregnant women. This quasy experimental study with a control group was conducted on 58 pregnant women with nausea and vomiting obtained by purposive sampling method. Respondents were divided into two groups, 29 respondents in each group. The pranayama and restorative yoga postures were given in the intervention group in 30 minutes for 7 days continuously. The quality of sleep was measured by the Pittsburgh Sleep Quality Index (PSQI). The results of data analysis using the Chi-Square test showed that there were no differences in sleep quality scores of pregnant women before and after being given pranayama and restorative yoga postures ($p>0.05$). Pregnant women with second and third trimester who experience nausea and vomiting in this study do not seem to be at increased sleep quality after doing pranayama and restorative yoga postures.Frequency and regularity in doing yoga become important points that need to be considered for better results.

Keywords*:pregnant women,sleep quality, NVP, yoga*

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INTRODUCTION

Pregnant women around the world, which is nearly 70% will experience nausea and vomiting during pregnancy (1). Nausea and vomiting pregnancy (NVP) are also one of the main causes of poorer quality of life for pregnant women (2). According to O'Brien and Naber (1992), sleep disturbances also showed increasing significant in women

suffering nausea and vomiting during pregnancy (3).

As with NVP, sleep disorders is also experienced by 70% of pregnant women (4). Facco et al. (2010)state that the sleep duration of pregnant women increases but not with the quality of sleep decreases with increasing gestational age.A literature study conducted by Kizilirmak et al. (2012) explains that during pregnancy, the placenta secretes steroid hormones, one of which is progesterone which has an inhibitory effect on the smooth muscles and nervous system, and affecting the respiratory system that causing shallow breathing. Moghadam & Rezaei (2015) also mentioned that sleep problems during pregnancy are caused by increased frequency of urination, shortness of breath, indigestion and also nausea and vomiting. Longer labor, more pain and discomfort during labor, higher rates of preterm labor and cesarean section, may experience in a woman who is sleep disorders during pregnancy(8). Given the high risk of adverse effects on the mother and fetus during pregnancy, it is important to overcome this problem of sleep disorders.

One of the non-pharmacological therapy was suggested to increasing sleep quality is exercise(9). Yoga is a non-pharmacological therapy and also one of the exercises that can help reduce the severity of nausea and vomiting (10). Narendran et al. (2005) also gives a prenatal yoga that used yoga postures and breathing practices for a pregnant woman to decrease of adverse perinatal outcomes. Beddoe et al. (2010) have used yoga to overcome sleep disorders in pregnant women and unfortunately it has not worked. The type of yoga that is done is Mindful Yoga and it is different from those Narendran et al. (2005). Because Mindful Yoga does not provide positive results on improving the quality of sleep for pregnant women, it is necessary to look at the effectiveness of other yoga movements consisting of yoga postures and breathing practices (pranayama). Therefore, this study aims to find out whether pranayama and restorative yoga postures effective to improve the quality of sleep in pregnant women.

METHODS

This study uses a quasi-experimental approach with the control group, pre-test and post-test design. The purposive sampling was used to collect participants with inclusion criteria: all pregnant women who experienced nausea and vomiting (first until third trimester), have a video player or smartphone, and willing to become participants. While the exclusion criteria were pregnant women who had hyperemesis gravidarum, gastritis, preeclampsia, placenta previa, cervix incompetent, abortion imminent or a history of bleeding, hypertension, and a history of hypertension or abortion in a previous pregnancy, and were unable to see and or hear. In the period from July to October 2018, the researcher can collect respondent in accordance with the inclusion and exclusion criteria as 58 pregnant women were in several working areas of public health centers in Banyumas Regency, Central Java, Indonesia.

The questionnaire was using the Pittsburgh Sleep Quality Index (PSQI) Indonesian version to assess the level of sleep quality(13). The PSQI questionnaire has some component score criteria: ≤5 = Good and 6 -21 = Poor. This instrument has been tested by Alim (2015) for validity and reliability.This test produces Alpha Cronbach's internal consistency test = 0.79, content validity 0.89, construction validity shows a Pearson component correlation to a good PSQI global score of around 0.50-0.80, group validity is known to be significant ($p < 0.001$). In addition to using the PSQI questionnaire, researchers also compiled a questionnaire related to respondent characteristics including education, employment status, economic status, age pregnancy, gravida, age of mothers and level of nausea and vomiting (PUQE-24). Both questionnaires were filled in independently by each respondent accompanied by a research assistant.

The participants were divided into two groups; each groupie the intervention group and the control group consisted of 29 respondents. Previously one of the researchers had received a yoga training certificate for pregnant women, who subsequently provided training to other

research members and several research assistants. In the intervention group, participants were trained in pranayama techniques and restorative postures for 30 minutes by researcher and research assistants. Then respondents were given a video of pranayama techniques and restorative postures and were asked to do the techniques and postures morning and evening for 7 days. During conducting pranayama techniques and restorative postures independently at the home of each respondent, they were given an observation sheet so that each time they did fill out the observation sheet as a control in the implementation of the given intervention. And researchers also provide personal contact to facilitate respondents in doing yoga independently if there are obstacles or questions. Whereas in the control group, pranayama techniques and restorative were trained after the post-test data collection ended. This study has been through a process of ethical clearance in advance by the Ethics Clearance Team at the Faculty of Medicine Universitas Jenderal Soedirman (164/KEPK/VI/2018).

RESULTS AND DISCUSSION

Chi-quare test results showed that there was no significant difference between the control group and the intervention group based on education (p = .209), employment status (p= .487), economic status (p= .597), age pregnancy (p= .178), gravida (p= .788), level of nausea vomiting (p= .773), and age of mothers (p= .315). These results indicate that the characteristics of the two groups before being given an intervention are homogeneous or equivalent (see Table 1). The majority of respondents' characteristics in this study are housewives (>70%) with low economic status (>50%), and who only complete basic education (>50%).

Table 2 describes the result of a statistical test in the PSQI level of the respondents before and after receiving the intervention of Yoga in the intervention group and Control Group.In the table, it can be seen that the value of p> 0.05, so it can be concluded that both of them there is no significant difference in the level of PSQI between before and after yoga was given to the intervention group.

In table 3, it described the result of a chi-square test. There are no differences (p>0,05) in the PSQI level post-test of the respondents between the intervention group and the control group.

In table 4 it can be seen that the majority of respondents, both in the control group and in the intervention group were dominated by first-trimester pregnant women. Although there is no statistical difference, in Table 4 can be seen that after being given yoga therapy, respondents in the intervention group experienced an increase in sleep quality. Before being given an intervention, it was found that in respondents with first trimester gestational age there were 17 (58.6%) people with poor sleep quality, but after being given an intervention the number of respondents with poor sleep quality was reduced to 13 (44.8%). In contrast to the control group, the number of respondents with first trimester gestational age who had poor sleep quality remained the same at the time of the post-test of 11 (37.9%).

There is no difference statistically in this study concludes that yoga postures and breathing practices (pranayama) given to pregnant women does not overcome the problem of sleep disorders in them.In a previous study conducted by Beddoe et al. (2010), yoga has also not been proven effective in overcoming sleep disorders in pregnant women. However, if observed based on gestational age, second-trimester pregnant women undergoing yoga therapy was found differences in sleep disturbance scores (measured using the *General Sleep Disturbance Scale*), but not in third trimester pregnant women(12).

Table 1. Homogeneity based on a characteristic of a pregnant woman in both the control group and intervention group (n = 59).

Characteristic	Control Group (n=29)		Intervention Group (n=29)		p-*value*
	f	%	f	%	
Education					
a. elementary	5	17,2	12	41,4	
b. junior high school	12	41,4	10	34,5	
c. senior high school	11	37,9	6	20,7	0,209
d. higher education	1	3,4	1	3,4	
Total	29	100	29	100	
Employment Status					
a. Unemployed	25	86,2	23	79,3	
b. Employed	4	13,8	6	20,7	0,487
Total	29	100	29	100	
Economic Status					
a. Low	15	51,7	17	58,6	
b. High	14	48,3	12	41,4	0,597
Total	29	100	29	100	
Age pregnancy					
a. First trimester	16	55,2	19	65,5	
b. Second trimester	13	44,8	8	27,6	0,178
c. Third trimester	0	0	2	6,9	
Total	29	100	29	100	
Gravida					
a. Primigravida	12	41,4	11	37,9	
b. Multigravida	17	58,6	18	62,1	0,788
Total	29	100	29	100	
Level of Nausea Vomiting					
a. Mild	21	72,4	20	69	
b. Moderate	8	27,6	9	31	0,773
Total	29	100	29	100	
Age of mothers					
a. Low risk	4	13,8	7	24,1	
b. High risk	25	86,2	22	75,9	0,315
Total	29	100	29	100	

However, the different results w\ere found from research conducted by Field et al., (2013). Field et al. using yoga therapy combined with tai chi to overcome sleep disorders in clinically depressed pregnant women that majority respondents are second-trimester and the results have proven to be effective. Other studies have also succeeded in proving that yoga effectively improves the sleep quality of pregnant women in the second and third trimester of pregnancy (15).

In this study, researchers did not limit the gestational age of the respondents. The majority of respondents in this study were first-trimester pregnant women and they have a poor quality of sleep if compare with

Table 2. Level PSQI Before and After Receiving Yoga On Intervention and Control Group

PSQI intervention group						PSQI Control Group					
	Poor		Good		p		Poor		Good		p
	n	%	n	%			n	%	n	%	
Before	25	86,2	4	13,8	0,280	Before	22	75,9	7	24,1	0,086
After	21	72,4	8	27,6		After	20	69,0	9	31,0	

other age of the pregnancy. Although there were no statistically significant differences, wherein these study respondents were dominated by first-trimester pregnant women, and some of them experienced improved sleep quality after being given yoga therapy.

According to Hasmi et al., (2016), the cause of first-trimester pregnant women experiencing sleep disorders is due to increased levels of the progesterone hormone. Increased levels of progesterone in pregnant women result in them feeling excessive daytime sleepiness, decreased muscle tone , increased risk of sleep apnea, snoring, and sleep interruptions. Other things such as frequent going to the bathroom, nausea and vomiting, discomfort associated with pregnancy such as back pain, fetal movements, and gastro-esophageal reflux can also improve sleep quality.

Based on the statement mentioned before, NVP conditions experienced by respondents in this study can also worsen the problem of sleep disorders in pregnant women. So also stated by Lee et al., (2000) that the quality of sleep during the first trimester is also disturbed due to fatigue and NVP.Whereas in the second trimester, sleep disorders are caused more because pregnant women experience gastro-esophageal reflux disease (GERD) at night (18).

According to Grooten et al., (2015) young age, nulliparity, non-Western ethnicity, low socio-economic status, diabetes, hypertensive disorders, psychopathology, assisted reproductive techniques, female fetuses, and multiple pregnancies are all also associated with excessive NVP. Characteristics of respondents in this study were mostly pregnant women at risk age (young age) and also with low economic status. So that these conditions are interrelated between the characteristics of respondents and the incidence of NVP with the problem of sleep disorders. While other conditions such as those already mentioned are related to NVP (diabetes, psychopathology, assisted reproductive techniques, female fetuses, and multiple pregnancies) and sleep disorders in pregnant women it is not known in this study, whether the respondent has the other risk factor related to NVP or not.

Unfortunately, the post-test of NVP in respondents was not reviewed in this study, so it is not known whether the first-trimester pregnant women who experienced an increase in sleep quality was also followed by a reduction in the severity of NVP. This becomes a limitation in this study because is better if the frequency of vomiting after being given yoga therapy also be assessed. Because it is possible that yoga therapy given to respondents in this study is effective in dealing with NVP. And as we know in Table 4 that first-trimester pregnant women actually experienced an increase in sleep quality compared to second-trimester pregnant women.

Table 3. Differences in PSQI level post-test between Intervention and Control Group

	Posttest of the PSQI Level				
	Poor		Good		p
	n	%	n	%	
Control Group	20	69	9	31	0,773
Intervention Group	21	72,4	8	27,6	

Table 4. Description of Sleep Quality for Pregnant Women by Age of Pregnancy

Age of Pregnancy	Pretest of the PSQI Level		Posttest of the PSQI Level	
	Poor n (%)	Good n (%)	Poor n (%)	Good n (%)
Control Group				
Trimester I	11 (37,9)	5 (31,3)	11 (37,9)	5 (31,3)
Trimester II	11 (37,9)	2 (6,9)	9 (31,0)	4 (13,8)
Trimester III	0 (0,0)	0 (0,0)	0 (0,0)	0 (0,0)
Intervention Group				
Trimester I	17 (58,6)	2 (6,9)	13 (44,8)	6 (20,7)
Trimester II	6 (20,7)	2 (6,9)	7 (24,1)	1 (3,4)
Trimester III	2 (6,9)	0 (0,0)	1 (3,4)	1 (3,4)

According to Chuntharapat et al. (2008), during pregnancy women experience a lot of discomforts that may not be an isolated symptom, but all integrated problems and one complaint can exacerbate other complaints. It is well known that yoga is effective in reducing the severity of NVP (10). According to Sindhu (2014) in Rafika (2018) that by practicing yoga during pregnancy is one of the useful solutions as a self-help media that will reduce discomfort during pregnancy, assist in childbirth, and even mentally prepare for the early days after giving birth and when raising children.

Narendran et al., (2005) have studied the efficacy of yoga on the successful outcome of pregnancies. The practices included; physical postures (asanas), breathing techniques
(pranayama), and meditation which were practiced every day for one hour by a yoga group from the date of entry into the study (between 18-20 weeks gestation) until the delivery of the baby. In contrast to this study, yoga was only given for 7 days. An earlier study also provided yoga interventions over a 10-week period and after the intervention, yoga was effective in reducing stress, anxiety, and improving the state of health (20). Pregnant women who exercise regularly, report lower levels of discomfort during pregnancy, and heal faster than those who do not exercise during pregnancy (21).

LIMITATION

The post-test of NVP in respondents was not reviewed in this study, so it is not known whether the first-trimester pregnant women who experienced an increase in sleep quality was also followed by a reduction in the severity of NVP. This becomes a limitation in this study because is better if the frequency of vomiting after being given yoga therapy also be assessed. Because it is possible that yoga therapy given to respondents in this study is effective in dealing with NVP.

ETHICAL APPROVAL

All procedures performed in studies involving human participants were in accordance with the ethical standards of Ethics Committee of the Medical Faculty, University of Jenderal Soedirman with reference number: 2817/KEPK/VI/2018.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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CONCLUSION

The results of this study concluded that yoga is not effective in dealing with sleep disorders in pregnant women with nausea, vomiting. But these results still suggest that yoga may have a role in overcoming sleep disorders in pregnant women with NVP. Thus it can also improve perinatal health. Women who did yoga in the first trimester experienced improved sleep quality from before to post-intervention, but not with women who started interventions in the second and third trimesters. Based on these findings, we propose yoga as a therapy that can routinely be carried out by pregnant women to improve the quality of the mother's sleep.

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