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Effectiveness of Prenatal Gentle Yoga to Improve Norephinefrine Levels in Primigravida and Multigravida Pregnant Women at Pkm Makassar City Region

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ABSTRACT

Pregnant women are at risk of experiencing anxiety and stress which causes the release of the hormone norepinephrine which is produced by most neurons in the brain stem and hypothalamus. Yoga has a positive impact on the body by reducing the performance of the hypothalamus, thereby releasing neuropeptides which stimulate the pituitary gland and releasing ACTH which suppresses the production of stress hormones. Prenatal Gentle Yoga is a therapy that supports the healthy balance between body and mind that is needed during the process of pregnancy until delivery.

This research was carried out at the Bara Baraya Health Center, Antang Health Center, Kapasa Health Center, and Mamajang Health Center. The research design used in this research is Quasi Experiment with a Nonequivalent Control Group Design approach. Sampling used a purposive sampling technique. The instrument used is ELISA (Enzyme Linked Limmuno Sorbent Assay). The research sample consisted of 24 respondents, 12 people in the intervention group, and 12 people in the control group. Criteria in this research; Primigravida and multigravida pregnant women, pregnant women in the II-III trimester with a gestational age of >=20 to <31 weeks, pregnant women without complications in pregnancy.

Based on statistical tests (Mann Whitney Test), norepinephrine levels in the intervention group decreased (p=0.008), there was a significant difference, in the control group the statistical test showed no significance (p=0.347). Thus, prenatal gentle yoga is effective in reducing levels of the hormone norepinephrine.

KEYWORDS: Norepinephrine; Pregnancy; Prenatal Gentle Yoga

ARTICLE DETAILS

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INTRODUCTION

Pregnancy is a natural thing experienced by women almost all over the world, but some women feel discomfort during pregnancy. This is mostly caused by physiological or psychological body changes such as sleep disorders and anxiety. World Health Organization (WHO), in 2011 the Maternal Mortality Rate (MMR) in South Asia was 188/100,000 live births, Southeast Asia 35/100,000 in Singapore 14/100,000 live births, in Malaysia 62/100,000 live births, Thailand 110/100,000 live births, Vietnam 150/100,000 live births, the Philippines 230/100,000 live births and Myanmar 380/100,000 live births. The maternal mortality rate is an indicator of the success of development in the health sector. MMR is the number of maternal deaths starting from pregnancy, childbirth and postpartum. Based on data, there has been a decline in MMR from 390 in 1991 to 305/100,000 live births in 2015(Indonesian Ministry of Health, 2018).

According to data from the Anxiety and Depression Associations of America (ADAA), 52% of pregnant women report experiencing increased anxiety during pregnancy. (Anxiety & Depression Associations of America (ADAA), 2016) The incidence of anxiety in Indonesia is 107 million pregnant women (28.7%) out of 373 million pregnant women who experience anxiety (IDHS).Anxiety during pregnancy is estimated to affect 15-23% of women and increases negative

risks for the mother and unborn baby(Dennis et al., 2017; Sinesi et al., 2019). Midwifery care is provided to minimize disturbances during pregnancy such as pregnancy exercises, lamazze method, meditation or prenatal yoga or yoga relaxation. Several studies state that prenatal gentle yoga is effective in reducing complaints during pregnancy such as back pain, stress, discomfort and anxiety.

*Prenatal gentleYoga*is a combination of physical movement, meditation and breathing techniques(Newham et al., 2014)with the aim of building and maintaining a healthy balance between all dimensions of the body and mind, as well as helping the mother communicate with the fetus, increasing the inner bond with the fetus, creating conditions for regular and directed relaxation of the subconscious mind towards a more relaxed state so that the body is able to release muscle tension, breathing slows down, the heart rate also slows down and gives a positive aura to the body(Bribiescas, 2013. Fathua, 2014). Relaxation has a positive effect in managing emotions which prevents excessive reactions during pregnancy,

RESEARCH METHODS

The research design is Quasi Experiment with a Nonequivalent Control Group Design approach. This study aims to determine the effectiveness of Prenatal Gentle Yoga in reducing norepinephrine levels in primigravida and multigravida pregnant women. The intervention that will be carried out in this research is providing prenatal gentle yoga to intervention group respondents at the Makassar City Regional Health Center. Determining the sample for this study used purposive sampling based on inclusion and exclusion criteria. The instruments used for laboratory tests are vacutainer tubes for storing urine samples, sample cups and ELISA kits.

. The data analysis used is univariate and bivariate analysis which is presented in a frequency distribution table. For statistical tests, the level of significance used is $p < 0.05$. Comparative hypothesis test for numeric variables with normal distribution in both paired groups for intra-group analysis using the paired T test, if the data distribution is not normal using the Wilcoxon test.

RESULTS

Table 1. Frequency distribution of respondent characteristics in the Makassar City Health Center Work Area

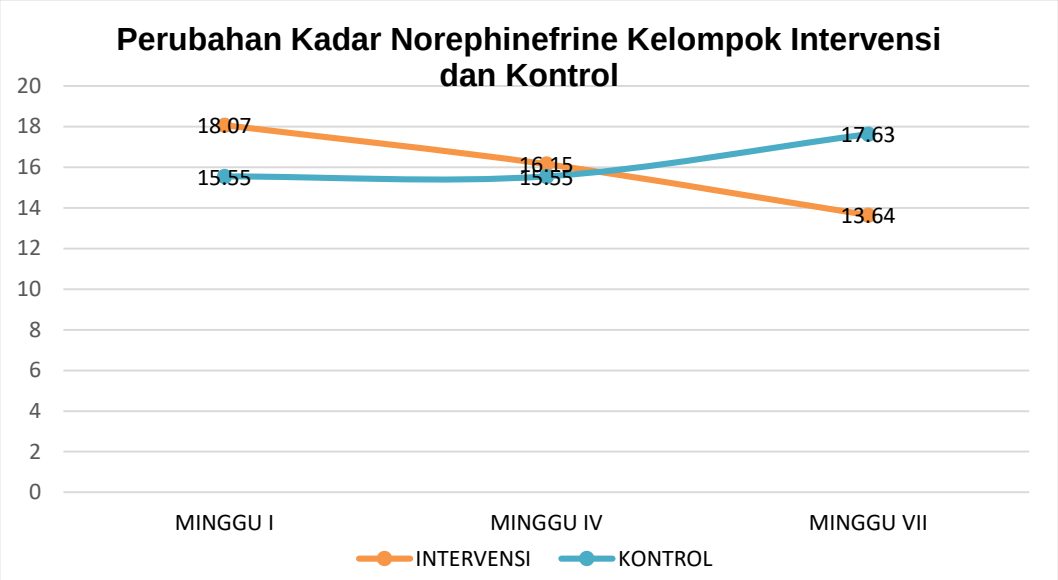
characteristics	Intervention(n)	Percentage(%)	Control(n)	Percentage(%)
Gravida				
Primigravida	3	(25%)	4	(33%)
Multigravida	9	(75%)	8	(67%)
Gestational Age				
20-23 Weeks				
24-27 Weeks	4	(33%)	5	(42%)
28-30 Weeks	3	(25%)	2	(16%)
	5	(42%)	5	(42%)
Education				
Tall	2	(17%)	3	(25%)
Low	10	(83%)	9	(75%)
Work				
Work	8	(67%)	8	(67%)
Doesn't work	4	(33%)	4	(33%)
Religion				
Islam	9	(75%)	9	(75%)
Christian	3	(25%)	3	(25%)
BMI				
Normal	5	(42%)	5	(42%)
Excessive Weight	7	(58%)	7	(58%)

Source: *Primary Data*

The data above shows that of the total of 24 respondents studied, there were primigravida respondents in the intervention group of3 (25%)and control4 (33%), and multigravida respondents in the intervention group were 9(75%)and control 8(67%). Gestational age 20-23 weeks in the intervention group was4 (33%)and control5 (45%), gestational age 24-27 weeksintervention group amounted to3 (25%)and control2 (16%), gestational age 28-30 weeksintervention group amounted to5 (42%)and control5 (42%). The intervention group's higher education amounted to2 (17%)and control3 (25%), low intervention group amounted to10 (83%)and control9 (75%). Respondents who worked in the intervention group were:8 (67%)and control8 (67%) and not workingintervention group amounted to4 (33%)and control4 (33%). The Islamic religion of the intervention group is equal to9 (75%)and control9 (75%) and

Christianintervention group amounted to3 (25%)and control3 (25%). Normal BMI in the intervention group was 5 (42%) control 5 (42%) and overweight BMI in the intervention group was 7 (58%) control 7 (58%)

Graph 3.1. Comparison of norepinephrine levels in the intervention group, Week I (pre) and Week VIII (post) PGY



The graph above shows that in the intervention group the mean value in week I was 18.07, week IV was 16.15 and week VIII was 13.63, so it was concluded that there was a decrease in norepinephrine levels. Meanwhile, the control group showed a mean value in week I of 15.55, week IV of 15.55 and an increase in week VIII of 17.63, so it can be concluded that there was an increase in the median value in week IV-Week VIII. Based on the statistical test (Wilcoxon test), there was no significant difference in the intervention group from week I to week IV (p=0.182), and week IV to week VIII (p=0.041) there was a significant difference. Meanwhile, the control group showed that statistical tests were not significant in weeks I - week IV (p=0.814) as well as weeks IV - Week VIII (p=0.272).

Comparison Table of Norephinephrine Levels in Intervention and Control Groups, week I and week VIII of PGY

Norepinephrine	Week I (Pre)	Week VIII (Post)	*p=value*
Intervention	18.07	13.64	**0.008
Control	15.55	17.63	**0.347
p-value	*0.184	*0.033	

*Mann Whitney test **Wilcoxon test

From table 3.5, it can be seen that the initial norepinephrine levels (week I) in the intervention group and control group were not significantly different (p=0.184). This shows that both groups had homogeneous initial norepinephrine levels. After the end there was a significant difference (p=0.033). This shows that there is a significant difference after being given Prenatal Gentle Yoga treatment. In the intervention group, there was a statistically significant difference (p=0.008) between the initial (week I) and final (after week VIII) norepinephrine levels of the Prenatal Gentle Yoga class, while in the control group there was no significant difference (p=0.347).

DISCUSSION

The results of the SPSS test regarding the effectiveness of prenatal gentle yoga in improving norepinephrine levels in primigravida and multigravida pregnant women were that initial norepinephrine levels (week I) in the intervention group and the control group were not significantly different (p=0.184). This shows that both groups had homogeneous initial norepinephrine levels. After the end (week VIII) there was a significant difference (p=0.033). This shows that there is a significant difference after being given Prenatal Gentle Yoga treatment. In the intervention group, there was a statistically significant difference (0.008) between the initial norepinephrine levels (week I) and the end (after week VIII) of the Prenatal Gentle Yoga class, while in the control group there was no significant difference (p=0.347).

This research shows that norepinephrine levels decreased in the intervention group because with yoga practice the body relaxes so that the hypothalamus stimulates the autonomic nerves then inhibits sympathetic nerve activity, and increases parasympathetic nerve activity which gives signals to release catecholamines which causes a decrease in

heart rate, muscle tension, and metabolic rate. and the production of hormones that trigger anxiety and stress such as norepinephrine(Maharani & Hayati, 2020; P Vijayalakshmi, Madanmohan, AB Bhavanani, Asmita Patil, 2004). Apart from that, the asana stage in yoga can overcome stress by modulating and optimizing sympathetic activity with pressure so that it immediately restores balance and prevents inhibition of the parasympathetic system. Apart from that, the pranayama and meditation stages also increase parasympathetic activity and reduce sympathetic activity so as to prevent stress-related and cardiovascular disorders. (Chanda Rajak, 2012). Apart from that, there was also an increase in norepinephrine levels in the control group due to the sympathetic response which was influenced by fast metabolic processes, environmental, emotional and endogenous stimuli (Raymond C, 2016). Research conducted at the Maharishi Mahesh Yogi Institute of Management and Technology in the United States proves that meditation is an excellent solution for managing stress and anxiety disorders.

Anxiety is influenced by neurotransmitters, one of which is norepinephrine(Nurul Rahmitha, 2017). The locus coeruleus is thought to contain the largest levels of norepinephrine in the brain and increased levels of norepinephrine have been detected in people experiencing anxiety

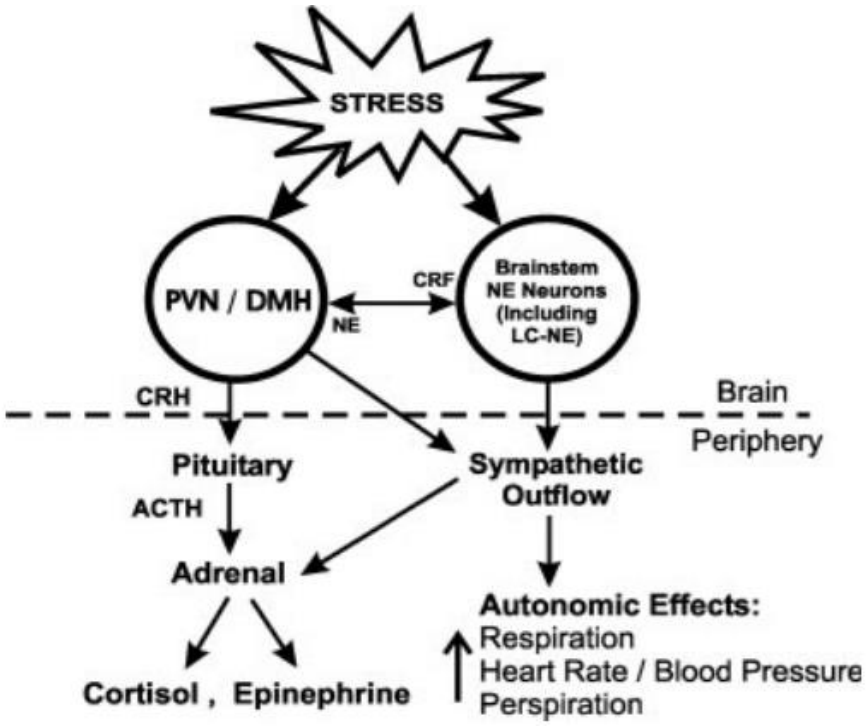


Figure 4.1. Acute stress response

Stressors activate the HPA axis and the LC-NE pathway (divisions A4, A6), which results in the release of stress hormones from the paraventricular nucleus (PVN) and dorso-medial hypothalamus (DMH). Corticotrophin-releasing factor (CRF) neurons of the PVN also interact reciprocally with LC-NE neurons during stress, resulting in increases in stress hormones and sympathetic outflow. Stress hormones, such as adrenocorticotrophic hormone (ACTH) and cortisol, facilitate autonomic reactivity in various systems, including increased respiratory, cardiovascular, and sweating. (Andrew W. Goddard et al, 2010)

During pregnancy there is an increase in stress, anxiety and depression which increases the regulation of the hypothalamus pituitary adrenal (HPA) axis. When stress occurs in pregnant women, oxygen to the fetus is blocked (Septianingrum, 2015), there is an increase in CRH (Cortricotropin Relating Hormone) which is associated with premature birth and a high risk of pregnancy outcomes such as low birth weight (LBW), impaired cognitive growth and development and social children who are more temperamental or more emotional (Yuksel, et al., 2013 (Qiao, et al., 2012) Blair, et al., 2011)

Experiments carried out on rats showed that lower norepinephrine levels indicated lower anxiety and in another study comparing NE levels between two groups where one group given meditation treatment showed lower NE levels than the control group (Selden et al, 1990, Curiati JA , Bocchi E et al, 2005). Research conducted(Chen et al., 2017)proves that prenatal gentle yoga can restore balance to the HPA axis of pregnant women and reduce stress. Prenatal gentle yoga exercise done 7 or 8 times is more effective in reducing anxiety compared to a frequency of <7 times, which means that the more frequently and regularly you give prenatal gentle yoga, the greater the positive effect you will feel (Alza, 2017)

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of research at PKM Makassar City Region, it can be concluded that providing Prenatal Gentle Yoga classes is effective in reducing norepinephrine levels in primigravida and multigravida pregnant women. This is shown by the results of the urine norepinephrine levels of pregnant women experiencing a decrease in norepinephrine hormone levels

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