



## Effectiveness of Tailored Interventions on Maternal Outcomes among Antenatal Mothers.

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### KEYWORDS

Antenatal mother, Exercise, Yoga, maternal Bodymass index, Bloodpressure, Fetal heart rate.

### ABSTRACT:

#### Introduction:

Antenatal mothers (AM) who are obese face specific considerations and potential risks associated with pregnancy. BMI of more than 30 or higher is considered obese, and it can have implications for both the mother and the developing baby. gestational diabetes, pre eclampsia blood clots, and high possibility of cesarean delivery .These complications can impact both the mother's health and the outcome of the pregnancy.

**Objectives:** The study aims to find the effect of a structured yoga and exercise intervention on selected maternal outcomes among antenatal mothers.

To assess and compare the pre and posttest levels of physiological parameters (BMI,Blood pressure, FHR) among antenatal mothers during antenatal period within and between the control and experimental group

**Methods:** Tailored intervention Yoga and antenatal exercise on maternal outcomes measured. The samples were easily chosen by means of consecutive sampling. they were divided into four groups, each with 33 samples: control (CN), yoga group (YG), antenatal exercise group (EG), and yoga and antenatal exercise group (YAE). The CN collective had standard care, the YG and EG groups got prenatal exercise and yoga intervention At the conclusion of the fourth, eighth, twelve, and sixteen weeks, BMI, the AMs' blood pressure, and FHR were measured. The groups received their respective treatment 2 days a week for 16 consecutive weeks. which showed that the YAE group subjects performed significantly better than the YG, EG, and CN groups in all temporal outcomes s (P.0.001).

**Results:** The mean arterial pressure (MAP )was significantly reduced consistently throughout the intervention period except for the posttest 3 vs posttest 2 period (p=0.199) in YEG. The other two groups did not showed such

**Conclusions:** The study concluded that tailored interventions Yoga and antenatal exercise will be more beneficial in normalizing BMI, BP, and FHR among Antenatal Mothers.

### 1. Introduction

The Antenatal care (AC) has become one of the most sought medical facility in the past few decades. So much of attention and medical expenses are being channeled

towards the Antenatal careHence health education strategy should be encouraged for early antenatal consultation for screening anemia.[1]. Prenatal yoga and exercises improve the sleep quality of pregnant women [2,3]. The American College of Obstetrics and



Gynecology suggests pregnant women should exercise an average of 20 to 30 min a day [4]. Pregnancy-induced hypertension (PIH) has been associated with a higher incidence of maternal obesity. Obesity can lead to gestational diabetes, hypertension, and depression, which can result in pregnancy complications [5-6]. Antenatal depression is a common maternal complaint; further attention should be given to the impact of unplanned pregnancy, social support, pregnancy-relevant complications, family conflicts, and also violence among pregnant women. Thus, all these are possible risk factors for antenatal depression condition [7]. Mental health is one major issue among the AM which can take a heavy toll on the physical presentation. Maternal obesity in pregnancy has been linked with increased risk of pregnancy induced hypertension (PIH). In some tertiary referral hospitals in Ghana, PIH is the leading cause of institutional maternal mortality [8]. The most frequently analyzed risk factors for antenatal depression were found to be intimate partner violence and bad physical relationship with spouse, and that leads for postnatal depression was low-income level. An unintended pregnancy was significantly accompanied along with perinatal depression [9]. GDM mothers were more likely to be overweight/obese and of Asian ethnicity [10], women who exercise can reduce the side effects of pregnancy, resulting in a healthier delivery, and a healthier baby weight [11-13]. Exercise and pregnancy were overall positively connected and contributed to improved health benefits for pregnant women [14-15]. Pregnant women should avoid any positions that require lying on their back or any back bending positions [16], inversions (e.g. handstands), and advanced positions that can harm the body and fetus. Yoga positions, such as triangle pose, bound angle pose, cat pose, warrior pose, forward fold, squatting, and retaliation pose, should be modified throughout a pregnancy [16,17]. The use of stretches and relaxation caused a significant decrease in lower body pain [18]. Additionally, regular pelvic muscle exercise through postural yoga can increase the tone of pelvic muscles helping decrease active labor and maternal pain [19]. Furthermore, yoga increased parasympathetic activity and reduced sympathetic activity in the third trimester, which sequentially decreased hypertension and preeclampsia, another study further confirmed

significantly less incidents of preeclampsia for women who practice yoga during pregnancy [20].

## 2. Objectives

The study aims to find the effect of a structured yoga and exercise intervention on selected maternal outcomes among antenatal mothers.

To assess and compare the pre and posttest levels of physiological parameters (BMI, Blood pressure, FHR) among antenatal mothers during antenatal period within and between the control and experimental group

## 3. Methods

Ethical clearance was obtained from the Saveetha Institute of Medical and Technical Sciences (SIMATS) Deemed University (Approval No 004/02/2023/IEC/SMCH). The sample size was increased by 10% to account for dropouts. Hence, a total sample size was arrived at 132. Samples divided into four groups, namely control (CN), Yoga group (YG), Antenatal exercise group (EG), and Yoga and Antenatal exercise group (YAE), with 33 samples in each group. The Yoga intervention for the study consisted of Asanas, pranayama, and dhyana techniques used. The Exercise Group received orientation for 10 minutes every session regarding the safety measures in doing the session exercises. This was followed by breathing techniques, diaphragmatic breathing exercises, and deep breathing with holds for 10 minutes. This lasted 15 minutes during the 1st 8 weeks and 10 minutes in the 2nd 8 weeks. Kegels and pelvic floor strengthening exercises were done for 5 minutes during 1st 8 weeks and 10 minutes in the 2nd 8 weeks. This was followed by a progressive relaxation technique for 10 minutes. Including the rest, both YG and EG performed the intervention 60 minutes a session, 2 sessions a week for 16 consecutive weeks. The outcomes were applied before the intervention (Pretest), after 4 weeks (post 1), after 8th week post 2, after 12th week (post 3) and after 16th week (Post 4).

## 4. Results and Discussion

A total 132 AM satisfying the selection criteria accounted for the study results. The outcome analysis of



the MAP showed that there was no significant difference between pre-test score at baseline and there was a significant difference in all other post test score. The YEG group showed a significant improvement compared to the other three groups (vs control-0.001, vs YG-0.049, vs EG – 0.002). The within group analysis revealed that the control group gradually increased in BMI levels significantly, However, the striking feature was YEG group did show a significant reduction in BMI in 16 weeks period in spite of expected gradual increase in body weight.

**Table 1 within group analysis of BMI– Repeated measures ANOVA**

		Sum of Squares	Df	Mean Square	F	Sig.
BMI – CO N	Betw een Grou ps	115.184	3	38.395	10.3	0.001*
	Withi n Grou ps	450.359	128	3.518		
	Total	565.543	131			
BMI – YG	Betw een Grou ps	2.343	3	.781	0.339	0.797
	Withi n Grou ps	294.775	128	2.303		
	Total	297.117	131			
BMI – EG	Betw een Grou ps	9.407	3	3.136	1.058	0.369
	Withi n Grou ps					
	Total					

Withi n Grou ps		379.308	128	2.963		
	Total	388.715	131			
	BMI – YEG	Betw een Grou ps	41.473	3	13.824	14.095
Withi n Grou ps		125.542	128	0.981		
	Total	167.015	131			

\*Significant difference

The BMI analysis showed that from a baseline homogeneity there was significant difference between the groups in other three instances. YEG group scored significantly better than the controls at all time, but the other two groups were similar to the control until the posttest2. The YEG group showed a significant improvement compared to the other three groups (vs control-0.001, vs YG-0.049, vs EG – 0.002). The within group analysis revealed that the control group gradually increased in BMI levels significantly, YG and EG did not show any changes during the intervention period, which itself a good effect given the fact that the antenatal women tend to increase their body weight during this period. However, the striking feature was YEG group did show a significant reduction in BMI in 16 weeks period in spite of expected gradual increase in body weight.

**Table 2 -within group analysis of MAP – Repeated measures ANOVA**

		Sum of Squares	Df	Mean Square	F	Sig.
MAP – CON	Between Groups	911.455	3	303.818	28.662	10.600
	Within Groups	3668.727	128			
	Total	4580.182	131			
MAP – YG	Between Groups	954.000	3	318.000	28.849	11.023
	Within Groups					
	Total					



	Within Groups	3692.727	128				
	Total	4646.727	131				
MAP - EG	Between Groups	584.182	3	194.727	10.459	18.618	0.001*
	Within Groups	1338.727	128				
	Total	1922.909	131				
MAP - YEG	Between Groups	1850.386	3	616.795	10.619	58.082	0.001*
	Within Groups	1359.273	128				
	Total	3209.659	131				

\*Significant difference

**Table 3 – between group analysis of FHR**

		Sum of Squares	Df	Mean Square	F	Sig.
FHR- PRE	Between Groups	313.727	3	104.576	1.96	0.123
	Within Groups	6822.606	128	53.302		2
	Total	7136.333	131			
FHR- POST1	Between Groups	142.023	3	47.341	0.96	0.411
	Within Groups	6271.273	128			6
	Total	6413.295	131			
FHR- POST2	Between Groups	1346.72	3	448.907	11.30	0.001
	Within Groups	5044.000	128	39.406	92	*
	Total	6390.727	131			
FHR- POST3	Between Groups	3195.81	3	1065.27	29.70	0.001
	Within Groups	4579.152	128	35.775	77	*
	Total	7774.970	131			

\*Significant difference

The outcome analysis of the MAP showed that there was no significant difference between pre-test score at baseline and there was a significant difference in all other

temporal outcomes. The post hoc analysis showed that the control group differed significantly from the other two groups in all the four measures. The post test 1,2 and 3 did not differ significantly between the three groups namely YG, EG and YEG group giving an appearance that the intervention had the same effects, however the within group analysis showed two important information. One, though there was a significant difference in the control group it was not on reducing MAP but instead there was a significant deterioration of MAP. The other three groups showed significant difference with a gradual reduction of MAP. Secondly, the MAP was significantly reduced consistently throughout the intervention period except for the posttest 3 vs posttest 2 period (p=0.199) in YEG. The other two groups did not showed such phenomenon.

The analysis of FHR clearly shows that the groups were similar at baseline and post test 1. The changes happened only in posttest 2 and posttest 3 where there was no difference between the control, EG and YG. However the YEG significantly differed from all the three groups in both posttest-2 and 3. The within group analysis showed that the control group did not showed any significant change, but all other groups showed significant change. YEG showed a early improvement and consistent improvement with significant difference between all the four pairs analyzed in the post hoc analysis unlike the other two intervention groups which showed significant improvement only on a long term.

The analysis of FHR clearly shows that the groups were similar at baseline and post test 1. The changes happened only in posttest 2 and posttest 3 .where there was no difference between the control, EG and YG. However the YEG significantly differed from all the three groups in both posttest-2 and 3. The within group analysis showed that the control group did not showed any significant change, but all other groups showed significant change. The results of the current study clearly state that combining Yoga and exercise clearly results in a better health benefit compared to providing Yoga and exercises alone. The improvement gained with such combination was also expressed in the fetal health that is reflected by the FHR. The weight reduction attained through the combining Yoga and Exercises have proved that the combination can be an important combination tool in managing the obese patients of other category as well. (Vuong et al., 2022) our study results on fetal health was



found consistent with previous literature. (Karthiga et al., 2022).

**Conclusion :** The study concludes that combining Yoga and exercises can be a better option compared to providing Yoga and exercises individually in improving the maternal and fetal health in terms of MAP, BMI and FHR.

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