

Effect Of Selected Yoga Asanas on Maternal and Fetal Outcome Among Gestational Diabetes Mothers at Selected Tertiary Hospital

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Abstract—Background: Gestational diabetes affects the health of the women, the fetus, and even after birth, the baby or child especially in developing countries.

Objectives: To determine the effect of selected yoga asanas on maternal and fetal outcome among gestational diabetes mothers. **Materials and Methods:** A total of 60 gestational diabetes mothers were recruited in the study, in experimental group 30 of them did specific yoga asanas from 32-33 weeks gestation till delivery. In control 30 of them continued routine practice as per the hospital policy, after delivery the maternal and fetal outcome was analyzed using appropriate descriptive and inferential statistical methods at p value <0.05

Results: Analysis of data showed statistically significant difference between, maternal and fetal outcome of mothers with gestational diabetes mellitus (GDM) between yoga group and control

group at p value <0.05. **Conclusion:** The present study found that yoga asanas had significant effect in reducing the blood glucose level of GDM mothers and had good maternal and fetal outcome among GDM mothers.

Index Terms—Gestational Diabetes; Yoga Asanas, Maternal and Fetal Outcome

I. INTRODUCTION

Pregnancy is a very special time in a Women's life and it is a state of dynamic physiologic adaptations to meet the demands of a developing fetus, Childbirth and lactation. ⁽¹⁾

Some changes occurring during this period seem exciting and pleasant to the mother, others can create discomforts or the disorders. It is true that the development of the baby is affected by several maternal as well as fetal factors. Hypertension, Diabetes, Malnutrition, Chronic renal disease etc. can cause harmful effects on the fetus. ⁽²⁾

Yoga being non-pharmacological treatment and cost effective, it should be advocated to antenatal mothers Practice of Yoga has shown some beneficial results in treating Diabetes and works great for pregnancy. ⁽³⁾

Yoga has 5 vital tools (yoga exercises, Breathing Exercise or Pranayama, Mudras, meditation, and deep relaxation) for pregnancy. When followed together, it seemed to improve the wellbeing of antenatal mothers and increase the chances of normal pregnancy and delivery. ⁽⁴⁾

Moreover, these exercises are helpful in carbohydrate metabolism by absorbing excessive glucose, thereby reducing the blood sugar level. In addition, it helps the pancreas and the liver to function effectively by regulating the blood sugar levels. ⁽⁵⁾

II. STATEMENT OF THE PROBLEM

“An experimental study to assess the effect of selected yoga asanas on maternal and fetal outcome among gestational diabetes mothers at selected tertiary hospital Puducherry.”

III. OBJECTIVES OF THE STUDY

1. To determine the effect of selected yoga asanas on maternal and fetal outcome among gestational diabetes mothers.
2. To determine the association between the maternal and fetal outcome among gestational diabetes mothers with selected socio demographic and obstetric variables in experimental and control group.

IV. MATERIALS AND METHODS

- Research approach—In this study Quantitative approach was used.
- Research design—The research design adopted for this study was Post-test only control group design.
- Sampling technique -In this study Simple random sampling technique was used and sample allocation was done by Computer generated table.
- Sample- The sample size for this study was 60.

Tools:

Tool 1-Profoma to assess the Socio demographic variables and obstetrical variables of the Gestational diabetes mothers.

Tool 2 - Checklist to assess the maternal and fetal outcome among Gestational diabetes mothers.

V. DATA COLLECTION PROCESS

- The main study data collection for the study was conducted from 18.07.2024 to 12.3.2025 among mothers attending Antenatal Out Patient Department, in Pondicherry Institute of Medical Sciences, Puducherry
- Ethical clearance was obtained from the Institutional Ethical Committee.
- After obtaining formal permission from the Institute, Consent was obtained from the participants after explaining the nature and purpose of the study.
- Gestational Diabetes mothers attending Out Patient Department were approached and initial screening for high-risk pregnancy was done.
- Gestational Diabetes mothers who fulfilled the inclusion criteria were selected.

- The researcher was independent of group allocation to the Gestational Diabetes mothers.
- Per day 2-3 antenatal mothers were selected for the study.
- The experimental group was given adequate information about selected yoga asanas and demonstration was given to them at least once in OPD. Along with that information booklet and yoga calendar was given to Gestational Diabetes mothers and were asked to follow yoga asanas from 32-33 weeks of gestation to till delivery. Reinforcement was given through WhatsApp group and at each visit to OPD.
- The intervention package for Experimental group consists of Yogic sukshma vyayamaa, Nadishodana pranayama and Dhyanam.
- Gestational Diabetes mothers in the control group continued routine practice as per the hospital policy

VI. RESULT

Table 1 showed that in control group, with regard to the age the majority of Gestational Diabetes Mothers, 13 (63.3%) belongs to 19–22 years and half of the Gestational Diabetes mothers, 23 (76.6%) was graduate. 22 (73.3%) of Gestational Diabetes mothers belongs to Hindu religion and 21 (70.0%) of Gestational Diabetes mothers were from urban area. The majority of Gestational Diabetes mothers, 21 (70.0%), belongs to nuclear family. With regard to family income, majority of Gestational Diabetes mothers, 20 (66.6%) had monthly income more than Rs. 15000/-. Most of the antenatal mothers, 19 (63.3%), were Working women.

In Experimental group, with regard to the age the majority of Gestational Diabetes Mothers, 20 (66.6%) belongs to 23–30 years and half of the Gestational Diabetes mothers, 19(63.3%) was graduate. 24 (80%) of Gestational Diabetes mothers belongs to Hindu religion and half of the Gestational Diabetes mothers, 15(50%) were from urban area. The majority of Gestational Diabetes mothers, 21 (70.0%), belongs to joint family. With regard to family income, majority of Gestational Diabetes mothers, 19 63.3%) had monthly income more than Rs. 10000-15000/-Most of the antenatal mothers, 20 (66.6%), were Working women.

Table 2 showed that Comparison of Gestational Diabetes Mothers according to maternal and fetal outcome an in-control group and experimental group. The table depicts that there 80% mothers had normal vaginal delivery in experimental and in control group only 63.3% had normal vaginal delivery but was not statistically significant difference in Type of delivery induction of labour and Condition of baby following delivery between experimental and control group at $p > 0.05$.

Table 3 inferred that statistically significant difference was found between control group and experimental group. In blood glucose level prior to labor for experimental group is 102.40 ± 15.34 and in control group 121.40 ± 17.72 P value .001 statistically significant difference in blood glucose level of mother prior to labour between experimental group and control group.

Table 4,5,6,7,8,9 showed that there was no statistical significance Association between the maternal and fetal outcome among gestational diabetes mothers with selected socio demographic and obstetric variables in experimental and control group.

VII. CONCLUSION

This study was conducted to evaluate the effect of selected yoga asanas on maternal and fetal outcome among gestational diabetes mothers. The present study found that yoga asanas had significant effect in reducing the blood glucose level of GDM mothers and

had good maternal and fetal outcome among GDM mothers.

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Table 1: Frequency and percentage distribution of gestational diabetes mothers according to socio demographic variables in control group and experimental group

N=60

S. No.	Demographic variables	Control Group (n=30)		Experimental Group (n=30)	
		f	%	f	%
1.	Age of the mothers (in years)				
	19 - 22 yrs	13	63.3	8	26.7
	23 - 26 yrs	8	26.7	10	33.3
	27 - 30 yrs	6	20	10	33.3
	> 30 yrs	3	10	2	6.7
2.	Education				
	Primary	2	6.66	4	13.33
	Secondary	5	16.66	7	23.33
	Graduate	23	76.66	19	63.33
3.	Religion				

	Hindhu	22	73.33	24	80
	Christian	2	6.66	6	20
	Muslim	6	20		
4.	Area of residence				
	Urban	19	63.33	15	50
	Rural	11	36.66	15	50
5	Type of family				
	Nuclear	21	70	9	30
	Joint	9	30	21	30
6	Family income				
	10000-14999	1	3.33	19	63.33
	15000-19999	20	66.66	6	20
	>=20000	9	30	5	16.66
7.	Occupation				
	Homemaker	11	36.66	10	33.33
	Working women	19	63.33	20	66.66

Table 2: Comparison of Gestational Diabetes Mothers according to maternal and fetal outcome in control group and experimental group. N=60

S. No.	Obstetric variables	Control Group (n=50)		Experimental Group (n=50)		Fisher's exact p value
		f	%	f	%	
1	Type of delivery					0.152 NS
	Normal vaginal delivery	19	63.3	24	80	
	Caesarean section	11	36.7	6	20	
2.	Induction of labor					0.474 NS
	Yes	10	52.63	10	41.66	
	No	9	47.36	14	58.33	
3.	Condition of the baby following delivery					0.430 NS
	Healthy and by Mother side	23	76.66	26	86.66	
	Observation in NICU	6	20	2	6.66	
	Admission in NICU	1	3.33	2	6.66	

Table 3: Comparison of Gestational Diabetes Mothers according to maternal and fetal outcome in control group and experimental group

N=60

S. No.	Obstetric variables	Control Group (n=50)		Experimental Group (n=50)		Fisher's exact p value
		Mean	Std. Deviation	Mean	Std. Deviation	
1	Blood loss following delivery	437.33	374.39	285.67	228.10	0.455 NS
2	Blood glucose level of the mother prior to labour	121.40	17.729	102.17	15.347	0.001 *S
3	Birth weight of the newborn	3.228	0.500	2.983	0.378	0.052 NS
4.	Gestational age at delivery	38.7	0.877	39.2	0.761	0.818 NS

Table 4: Association between the type of delivery with selected sociodemographic variable and obstetric variable in experimental group

n=60

S.NO	Sociodemographic variable and obstetric variable	Type of delivery				Fisher's exact p value
		NVD		Cesarean section		
		f	%	f	%	
1.	Age of the mothers in years					0.345
	19-22	14	32.6	7	41.2	NS
	23-36	11	25.6	7	41.2	
	27-30	14	32.6	2	11.8	
	>30	4	9.3	1	5.9	
2.	Gravida					0.528
	Primi para	29	67.4	10	58.8	NS
	Multi para	14	32.6	7	41.2	

Table 5: Association between induction of labor with selected sociodemographic variable and obstetric variable in experimental group

N=60

S.NO	Sociodemographic variable and obstetric variable	Induction of labour				Fisher's exact p value
		Yes		No		
		f	%	f	%	
1.	Age of the mothers in years					0.345
	19-22	7	35	7	30	NS
	23-36	4	20	7	30	
	27-30	6	30	8	34.8	
	>30	3	15	1	4.3	
2.	Gravida					0.224
	Primi para	16	80	13	56.5	NS
	Multi para	4	20	10	43.5	

Table 6: Association between birth weight of the newborn with selected sociodemographic variable and obstetric variable in experimental group

N=60

S.NO	Sociodemographic variable and obstetric variable	Birth weight of the newborn						Fisher's exact p value
		2.5-2.9kg		3.0-3.4 kg		>3.5		
		f	%	f	%	F	%	
1.	Age of the mothers in years							0.880 NS
	19-22	2	66.7	15	32.6	4	36.4	
	23-26			14	30.4	4	36.4	
	27-30	1	33.3	12	26.1	3	27.3	
	>30			5	10.9			
2.	Gravida							1.000 NS
	Primi para	2	66.7	30	65.2	7	63.6	
	Multi para	1	33.33	16	34.8	4	36.4	

Table 7: Association between Condition of the baby following delivery with selected sociodemographic variable and obstetric variable in experimental group

N=60

S.NO	Sociodemographic variable and obstetric variable	Condition of the baby following delivery						Fisher's exact p value
		Healthy and by Mother side		Observation in NICU		Admission in NICU		
		f	%	f	%	F	%	
1.	Age of the mothers in years							0.556 NS
	19-22	15	30.6	3	37.5	3	100	
	23-26	15	30.6	3	37.5			
	27-30	14	28.6	2	25			
	>30	5	10.2					
2.	Gravida							0.116 NS
	Primi para	33	67.3	3	37.5	3	100	
	Multi para	16	32.7	5	62.5			

Table 8: Association between blood loss following delivery with selected sociodemographic variable and obstetric variable in experimental group

N=60

S.NO	Sociodemographic variable and obstetric variable	Blood loss following delivery			p value
		f	Mean	Std.Deviation	
1.	Age of the mothers in years				0.282 NS
	19-22	21	390	393.31	
	23-26	18	414.44	313.61	
	27-30	16	261.25	202.57	
	>30	5	372	277.7	
2.	Gravida				0.956 NS
	Primi para	39	358.72	327.81	
	Multi para	21	366.67	302.85	

Table 9: Association between blood glucose level of the maternal prior to labour with selected sociodemographic variable and obstetric variable in experimental group

N=60

S.NO	Sociodemographic variable and obstetric variable	Blood glucose level prior to labour			p value
		f	Mean	Std. Deviation	
1.	Age of the mothers in years				0.349 NS
	19-22	21	117.52	19.05	
	23-26	18	109.67	19.84	
	27-30	16	109.19	18.41	
	>30	5	103.60	17.63	
2.	Gravida				0.515 NS
	Primi para	39	112.97	21.30	
	Multi para	21	109.57	14.30	