



# INFLUENCE OF SOCIO ECONOMIC STATUS ON NUTRITIONAL, HEALTH AND SOMATIC PROFILE AMONG RURAL PREGNANT WOMEN

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**Abstract:** Gestational diabetes mellitus (GDM) is a pregnancy-specific disease defined as ‘diabetes that is first diagnosed in the 28 th week of pregnancy of pregnancy that is clearly not overt diabetes’ The occurrence of Gestational Diabetes Mellitus (GDM), has been linked to obesity, GDM in earlier pregnancies, older maternal age, ethnicity and multiparity as well as family history of diabetes. Obesity is a known risk factor of GDM. The prevalence of gestational diabetes mellitus (GDM) varies in direct proportion with the prevalence of type 2 diabetes. We examined socio economic status, health and nutrition status a total of 522 women visiting community health centers (CHC) in Moka(94) and Torangal(428), were screened for GDM. In phase one the screening of the pregnant women for prevalence of GDM by one step procedure assessing plasma blood sugar values. In the present study (n=127) where having impaired glucose tolerance. The rural women diagnosed with impaired tolerance after screening were about 48.8 percent (62) in the age group of 20-21 years. A higher percentage of the subjects (79.5) predominantly belong to joint families. The family size of 2-4 members in the house hold was 42.5 percent and 35.4 percent were 5-6 members in a household. The age group in this study is lower because the subjects were primigravida. About 26.8 percent of them attained menarche at the age of 12 years and 11.8 percent of the respondents attained at 14 years. The age at marriage was found to be 59.1 percent in the age group of 18-19 years this indicates that the respondents were married in their teenage years in most of the rural households. The pre pregnancy weight was measured at the first antenatal visit 18.9 percent of the respondents were in the range of 39-42kg and 35.4 percent of the respondents were in the range of 43-47 kg and only 15 percent of the respondents were above 53 kg. 10.2 percent of the subjects were in very good health among all age groups and only 7.1 percent were having fair health status. However, the findings established the non significant association between age group and general health condition ( $\chi^2 = 2.41$ NS). 86.4 percent of subjects in 21 and above years were not suffering from common ailments in the past 3 months. The association was significant ( $X^2 = 6.17^*$ ). Subjects of nuclear family were having less incidence (15.4%) of common ailments when compared to joint family (37.6%) subjects, which was significant( $X^2 = 4.62^*$ ).On the whole the data reveals that association of age with incidence of maternal Diabetes is statistically significant (  $X^2 = 6.68^*$ )

## I. INTRODUCTION

Gestational Diabetes is thought to arise as the result of insulin resistance due to pregnancy hormones, which is not adequately compensated for by the pancreatic  $\beta$ -cells through increased proliferation and insulin secretion. Gestational Diabetes is a global health concern, and in India, the condition affects as many as 5 million women annually (Morampudi S et.al, 2017). Gestational Diabetes is associated with an increased risk of obstetrical complications and adverse fetal outcomes. These include preeclampsia, Caesarean delivery, stillbirth, macrosomia, and hypoglycaemia Gestational Diabetes association with family history,

obesity, advanced maternal age, significant gaps remain in our understanding of the risk factor and pathogenesis. (Jadhao2017)in his study on socio-demographic factors for high risk pregnancy in rural Nagpur area also suggests GDM as risk factor, anaemia for low weight gain during pregnancy. Recent studies suggested that earlier menarche was significantly associated with an increased risk of gestational diabetes. Despite a government mandate to screen all pregnant women for GD, to date there has been incomplete implementation and uptake of screening programs. (Mishra, et al. 2018).

#### Methodology:

In phase one the screening of the pregnant women was done in women visiting community health centers (CHC) in Moka(94) and Torangal(428) located in Bellari district. In phase II The Screening based on the one step screening of oral glucose test (seshaih.et.al 2011) and (Balaji.et.al 2011) a total of 123 subjects selected had impaired Glucose intolerance, 8 subjects were GDM positive and 04 subjects lost the child during delivery, so the total subjects for the study were 127.

TABLE – 1 Classification of Respondents by Age group, Type of family and Family size

Characteristics	Category	Respondents	
		Number	Percent
Age group (years)	18-19	43	33.9
	20-21	62	48.8
	22+	22	17.3
Type of family	Nuclear	26	20.5
	Joint	101	79.5
Family size (members)	2-4	54	42.5
	5-6	45	35.4
	7+	28	22.1
<b>Total</b>		<b>127</b>	<b>100.0</b>

The subjects were in the age, type of family and family size of is given in the Table-1the results depict that 48.8 percent of the subjects (62) were in the age group of 20-21 years. A higher percentage of the subjects (79.5) predominantly belong to joint families. The family size of 2-4 members in the house hold was 42.5 percent and 35.4 percent were 5-6 members in a household. The age group in this study is lower because the subjects were primigravida. The prevalence of Gestational Diabetes varies with the population studied. The number of women having access to this screening has to be increased as this may prevent adverse outcome. Similar results were reported by Sonali sain et.al, 2012 were 94.2 percent belonged to age group of <25 years 48.3 percent were teenage mothers. Seshaih et.al, 2008 in his study on GDM screening in urban and rural areas reported the average age of rural mothers of 22.5 years while urban and semi urban mothers were of an average of 23.7and 23.4 years respectively.

TABLE – 2 Classification of Respondents by Age at menarche and Age at marriage

N=127

Characteristics	Category	Respondents	
		Number	Percent
Age at menarche	12 years	34	26.8
	13 years	78	61.4
	14+ years	15	11.8
Age at marriage (years)	18-19	75	59.1
	20-21	52	40.9
<b>Total</b>		<b>127</b>	<b>100.0</b>

The classification of the respondents on the age at menarche and age at marriage is presented in the Table -2 About 26.8 percent of them attained menarche at the age of 12 years and 11.8 percent of the respondents attained at 14 years. The age at marriage was found to be 59.1 percent in the age group of 18-19 years this indicates that the respondents were married in their teenage years in most of the rural households. In the study of ErginA.,2022 showed that the risk of GDM was found to be 2.3 times higher in pregnant women with a menarche age of <12 years..

TABLE – 3 Response on Menstrual flow, menstrual cycle and Problems faced during menstrual period

N=127

Characteristics	Category	Respondents	
		Number	Percent
Menstrual flow	3 days	93	73.2
	4-5 days	34	26.8
Menstrual cycle	25-28 days	90	70.9
	29-30 days	37	29.1
Problems faced during menstrual period @	Cramps	120	94.5
	Back pain	100	78.7
	Calf muscle	22	17.3

@Multiple Response

The response of the subjects with respect to the menstrual flow, menstrual cycle and the problems faced during the periods was recorded and presented in Table 4 which depicts that 73.2 percent reported that their periods last for 3 days and 78.9 percent had the cycle of 25-28 days and the respondents did face some problems during the periods 94.5 percent were having cramps 78.7 percent of the respondents had back pain. (This was a multiple response).

TABLE – 4 Response on Age at conceiving and Pre pregnancy weight

Characteristics	Category	Respondents	
		Number	Percent
Age at conceiving (years)	18-19	43	33.9
	20-21	62	48.8
	22+	22	17.3
Pre pregnancy weight (kgs)	39-42	24	18.9
	43-47	45	35.4
	48-52	39	30.7
	53+	19	15.0
<b>Total</b>		<b>127</b>	<b>100.0</b>

N=127

Age at conceiving and pre pregnancy weight of the subjects is presented in the Table -4 around 33.9 percent of the subjects conceived at the age of 18-19 years, 48.8 percent of the subjects were pregnant at the age of 20-21 years. This gives us an indication that the respondents are pregnant at a very young age.

The pre pregnancy weight was measured at the first antenatal visit 18.9 percent of the respondents were in the range of 39-42kg and 35.4 percent of the respondents were in the range of 43-47 kg and only 15 percent of the respondents were above 53 kg.

If the pre-pregnancy BMI value is more than 25 kg/cm<sup>2</sup>, the risk of GDM was found to be approximately 2 times higher (Ergin, et. al,2022)

TABLE – 5 Respondent by Body mass index by Type of family

Body mass index	Nuclear		Joint		Combined	
	N	%	N	%	N	%
	Malnourished (<18.5)	4	15.4	25	24.7	29
Normal (18.5-22.9)	13	50.0	65	64.4	78	61.4
Over weight (23.0-24.9)	3	11.5	6	5.9	9	7.1
Pre obese (25.0-29.9)	6	23.1	5	5.0	11	8.7
Total	26	100.0	10	100.0	12	100.0
$\chi^2$ Test			1	7	0	

\*Significant at 5% level,

 $\chi^2(0.05,3df) = 7.815$ 

The subjects were further classified according to standard cutoff values of BMI as given by WHO (2004) for Asians Table -5 the classification was compared with the type of family of the subjects the nuclear family has the highest percentage of the 11.5 percent and 23.1 percent overweight and pre obese respectively, while in joint and combined family type subjects were 24.7 percent and 22.8 percent malnourished respectively. 64.4 percent of the subjects were normal in joint family followed by 61.4 and 50 percent in combined and nuclear families respectively. The overweight and pre obese subjects were 7.1 and 8.7 percent respectively which is the perceived traditional risk factor for GDM is found to be lower in rural settings, which was also reported by Chebrolu, P.,(2021)

TABLE 6 – Association between Variables and Eat outside food

Variables	Category	Sample	Eat outside food				$\chi^2$ Test
			No		Yes		
			N	%	N	%	
Age (years)	18-19	43	16	39.0	25	61.0	6.91*
	20-21	62	15	24.2	47	75.8	
	21+	22	2	9.1	20	90.9	
Type of family	Nuclear	26	7	26.9	19	73.1	0.02 <sup>NS</sup>
	Joint	101	26	25.7	75	74.3	
Body mass index	Malnourished	29	5	17.2	24	82.8	6.00*
	Normal	78	26	33.3	52	66.7	
	Over weight	20	2	10.0	18	90.0	
<b>Total</b>		<b>127</b>	<b>33</b>	<b>26.0</b>	<b>94</b>	<b>74.0</b>	

\*Significant at 5% level,

NS : Non-significant,

 $\chi^2(0.05,2df) = 5.991$

Table -6 depicts the association between the age and type of family and body mass index with the practice of eating out. There was a significant association between eating outside and age there was no significant association when compared with type of family. There was a significant association between eating out and the BMI of the Subjects. 90percent overweight individuals were eating out. ( $\chi^2 = 5.991$ ). According to the study conducted by Ergin.A., et al 2022 If the pre-pregnancy BMI value is more than 25 kg/cm<sup>2</sup>, the risk of GDM was found to be approximately 2 times higher.

TABLE – 7 Association between Age group and General health

Age group (years)	Sample	General health						$\chi^2$ Test
		Very good		Good		Fair		
		N	%	N	%	N	%	
18-19	43	6	14.0	35	81.4	2	4.7	2.41 <sup>NS</sup>
20-21	62	4	6.5	53	85.5	5	8.1	
21+	22	3	13.6	17	77.3	2	9.1	
<b>Total</b>	<b>127</b>	<b>13</b>	<b>10.2</b>	<b>105</b>	<b>82.7</b>	<b>9</b>	<b>7.1</b>	

\*Significant at 5% level,  $\chi^2$  (0.05,4df) = 9.488

The health of the subjects and the age group when assessed in Table -7, translates that there was non-significant association with 10.2 percent of the subjects were in very good health among all age groups and only 7.1 percent were having fair health status. However, the findings established the non-significant association between age group and general health condition ( $\chi^2 = 2.41$ NS)

TABLE – 8 Association between Variables and Incidence of Common ailments

Variables	Category	Sample	Common ailments				$\chi^2$ Test
			Yes		No		
			N	%	N	%	
Age (years)	18-19	43	19	44.2	24	55.8	6.17*
	20-21	62	20	32.3	42	67.7	
	21+	22	3	13.6	19	86.4	
Type of family	Nuclear	26	4	15.4	22	84.6	4.62*
	Joint	101	38	37.6	63	62.4	
Body mass index	Malnourished	29	7	24.1	22	75.9	1.56 <sup>NS</sup>
	Normal	78	27	34.6	51	65.4	
	Over weight	20	8	40.0	12	60.0	
<b>Total</b>		<b>127</b>	<b>42</b>	<b>33.1</b>	<b>85</b>	<b>66.9</b>	

\*Significant at 5% level, NS: Non-significant,  $\chi^2$  (0.05,1df) = 3.841

The association between common ailments of the subjects in comparison of age type of family and BMI depicted in Table -8. Further, 86.4 percent of subjects in 21 and above years were not suffering from common ailments in the past 3 months. The association was significant ( $X^2 = 6.17^*$ ). Subjects of nuclear family were having less incidence (15.4%) of common ailments when compared to joint family (37.6%) subjects, which was significant ( $X^2 = 4.62^*$ ). While there was a non-significant association observed between BMI and Common ailment among subjects. ( $x^2=1.56$  NS).

TABLE – 9 Association between Age and Type of family with Incidence of maternal diabetes

Variables	Category	Sample	Incidence of diabetes				$\chi^2$ Test
			Yes		No		
			N	%	N	%	
Age group (years)	18-19	43	5	11.6	38	88.4	6.68*
	20-21	62	15	24.2	47	75.8	
	21+	22	1	4.5	21	95.5	
Type of family	Nuclear	26	8	30.8	18	69.2	4.80*
	Joint	101	13	12.9	88	87.1	
<b>Total</b>		<b>127</b>	<b>21</b>	<b>16.5</b>	<b>106</b>	<b>83.5</b>	

\*Significant at 5% level,  $\chi^2$  (0.05,1df) = 3.841,  $\chi^2$  (0.05,2df) = 5.991

Table 9 indicate the association between age of the family members and type of family with incidence of maternal Diabetes. It is evident from the findings that slightly higher percentage (24.2%) belongs to the age group of 20-21 years noticed with incidence of diabetes in the family. Further 11.6 percent of respondents in the age group of 18-19 years specifying with incidence of diabetes. On the whole the data subjected to statistical test reveals that the age has significant association with incidence of maternal Diabetes ( $X^2 = 6.68^*$ ). Regarding the type of family the respondents belong to nuclear family indicating the incidence of maternal diabetes with 30.8percent as compared to considerably lesser percentage of (12.9percent) among the respondent belong to joint family. The association between type of family and the incidence of diabetes among the respondents showed significance at 5percent ( $X^2 = 4.80^*$ ). In the study conducted by Lewandowska, M 2021 Apart from the maternal influence of diabetes, the results suggest a significant influence of diabetes in the father on the risk of GDM, even (interestingly) in lean pregnant women.



TABLE – 10 Association between Variables and Awareness of concept of diabetes

Variables	Category	Sample	Awareness of concept of diabetes				$\chi^2$ Test
			Partially aware		Not aware		
			N	%	N	%	
Age (years)	18-19	43	7	16.3	36	83.7	8.29*
	20-21	62	17	27.4	45	72.6	
	21+	22	11	50.0	11	50.0	
Type of family	Nuclear	26	12	46.2	14	53.8	5.66*
	Joint	101	23	22.8	78	77.2	
Body mass index	Malnourished	29	3	10.3	26	89.7	6.26*
	Normal	78	24	30.8	54	69.2	
	Over weight	20	8	10.0	12	60.0	
<b>Total</b>		<b>127</b>	<b>35</b>	<b>27.6</b>	<b>92</b>	<b>72.4</b>	

\*Significant at 5% level,  $\chi^2$  (0.05,2df) = 5.991  $\chi^2$  (0.05,1df) = 3.841

Table 10 is the association of the awareness of concept of diabetes 83.7 percent of younger subjects were not aware. 77.2 percent of subjects belonging to the joint family were not aware 89.7percent of the subjects who were undernourished were also not aware about gestational diabetes mellitus. Only 50 percent of the 21 years and above group of subjects were partially aware of the concept of gestational diabetes mellitus.

#### Conclusion:

Therefore, a comprehensive evaluation of the menstrual history by healthcare professionals is important for future pregnancy risks. It is important to understand risk factors for GDM and to establish preventive strategies among high-risk populations. In addition, this study will shed light on future epidemiological and cohort studies.

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