

A Study to Assess the Effect of Planned Teaching on Knowledge Regarding Gestational Diabetes Among The

Antenatal Mothers Admitted In Selected Hospitals.

Ms Elizabeth David¹, Mrs Kavita Kelkar², Dr. Mrs. Nisha Naik³, Mrs. Rupali Salvi⁴

¹M.Sc. Nursing student, Dr.D.Y.Patil College Of Nursing pune.

²Assistant Professor, at Dr. D. Y. Patil College of Nursing, Pimpri, Pune.

³Dr. D. Y. Patil College of Nursing, Pimpri, Pune.

⁴Principal Dr. D. Y. Patil College of Nursing, Pimpri, Pune Professors,

ABSTRACT

Introduction:

God created families and gave mothers a unique place in that unit. There is no doubt that childbirth is a life changing event. Unfortunately, as wonderful and joyful experience as it for many. It can also be difficult period, bringing with it new problems as well as suffering. With an estimated 50.8 million people living with diabetes, India has the largest diabetes population in the world. Diabetes complicates and 20% of all pregnancies worldwide, which includes presentational diabetes mellitus and GDM. Gestational diabetes mellitus is a perfect window of opportunity for the prevention of DM in two generations, and its incidence is increasing in our country. Awareness of the conditions among antenatal women will translate into prevention and early diagnosis of the disease. In the past decade, the prevalence of gestational diabetes mellitus has been increasing worldwide. In 2015 alone, it was estimated that 20.9 million women had hyperglycaemia in pregnancy, 85.1% of which were due to GDM. GDM is associated with an increased risk of pre-eclampsia for mothers in the antepartum period and a higher risk of macrosomia, hypoglycaemia, jaundice, respiratory distress syndrome and hypocalcaemia in infants. After delivery, though the glucose levels return to normal, the mother is at a higher risk for type 2 DM. Gestational diabetes affects 3-10% of pregnancies, depending on the population studied. Approximately 7% of all pregnancies are complicated by GDM, resulting in more than 200,000 cases annually. In the United States 21 million people (7% of the population) have some form of diagnosed diabetes. Another 6 million people may be undiagnosed. **The present study title:** A Study To Assess The Effect Of Planned Teaching On Knowledge Regarding Gestational Diabetes Among The Antenatal Mothers Admitted In Selected Hospitals. The objectives of the study to identify the knowledge regarding gestational diabetes mellitus among the antenatal mothers, to determine the effect of teaching of gestational diabetes mellitus among antenatal mothers, to correlate the association between level of knowledge and selected demographic variables among the gestational diabetes antenatal mothers. **Material and Methods:** In present study, researcher adopted Experimental pre-test design for this study The study carried out 60 samples. Ethical clearance was taken. A Non-probability Purposive Sampling Technique was used. The significance was calculated by using mean, standard deviation, and calculated 't' value, and association was done by Fisher's exact test with demographic variable. **Result:** In Pre-test knowledge score regarding gestational diabetes mellitus among the antenatal mothers by Frequency and Percentage. In pre-test, majority 52 i.e. (86.7%) of them had average knowledge (Score 7-12) where as minority i.e. 03 i.e. (5%) of the antenatal mothers had poor knowledge (Score 0-6) regarding gestational diabetes mellitus, and 05 i.e. (8.3%) of them had good knowledge (Score 13-18) regarding gestational diabetes mellitus. In comparison Majority of samples 52 i.e. (86.7%) were having average (7-12) knowledge and none of the sample was having excellent knowledge in pre-test regarding gestational diabetes mellitus whereas majority of samples 58 i.e. (96.7%) were having excellent (7-12) knowledge and minority 02 i.e. (3.3%) of the sample was having Good (13-18) knowledge in post-test regarding gestational diabetes mellitus. **Conclusion:** The 't' test done to find the significant effect of Plan Teaching on knowledge of GDM for antenatal mothers revealed that there is a highly significant gain in the knowledge. Educating people on GDM by plan teaching have significant effect in improving their knowledge. This was helpful for better prevention and treatment.

Keywords: (Effect, Knowledge , Antenatal mothers , Gestational Diabetes Mellitus)

INTRODUCTION

God created families and gave mothers a unique place in that unit. There is no doubt that childbirth is a life changing event. Unfortunately, as wonderful and joyful experience as it for many. It can also be difficult period, bringing with it new problems as well as suffering. With an estimated 50.8 million people living with diabetes, India has the largest diabetes population in the world. Diabetes complicates and 20% of all pregnancies worldwide, which includes presentational diabetes mellitus and GDM. Gestational diabetes mellitus is a perfect window of opportunity for the prevention of DM in two generations, and its incidence is increasing in our country. Awareness of the conditions among antenatal women will translate into prevention and early diagnosis of the disease. In the past decade, the prevalence of gestational diabetes mellitus has been increasing worldwide. In 2015 alone, it was estimated that 20.9 million women had hyperglycaemia in pregnancy, 85.1% of which were due to GDM. GDM is associated with an increased risk of pre-eclampsia for mothers in the antepartum period and a higher risk of macrosomia, hypoglycemia, jaundice, respiratory distress syndrome and hypocalcaemia in infants. After delivery, though the glucose levels return to normal, the mother is at a higher risk for type 2 DM. Gestational diabetes affects 3-10% of pregnancies, depending on the population studied. Approximately 7% of all pregnancies are complicated by GDM, resulting in more than 200,000 cases annually. In the United States 21 million people (7% of the population) have some form of diagnosed diabetes.⁵ Another 6 million people may be undiagnosed. Approximately 3-10% of pregnancies in the United States are complicated by diabetes, of which 90% is gestational diabetes and 8% is pre-existing, insulin-resistant diabetes. The incidence of insulin-resistant diabetes is increasing markedly in the United States, probably related to rising population obesity and shifts in ethnicity.^{135,000} pregnant women get the condition every year; approx. 1 in 2,014 or 0.05% or 135,000 people in USA are effected.⁶ Incidence for USA for Gestational diabetes: 134,999 per year. Gestational diabetes accounted for 9% of new cases of diabetes in Australia (The National Diabetes Register, Australia's Health 2004. Giving awareness helps the antenatal women to achieve and maintain pregnancy and give birth to healthy infants. With the active participation of well-motivated women in the treatment plan and careful management helps in positive pregnancy outcomes.

NEED FOR THE STUDY

Health of mother is tender and integral component of total care and cannot be neglected because of the fact that if mother is healthy; the children also will be healthy, which in turn affects the nation's health. Every year more than 200 million women become pregnant, and about 15% are likely to develop complications that requires skilled Obstetric care to prevent death or serious ill health. All women whether their pregnancies are complicated or not, need good quality maternal health services during pregnancy. In Indian context, screening is essential in all pregnant women as the Indian women have eleven fold increased risk of developing glucose intolerance during pregnancy as compared to European women. A significant increase in frequency of abortions and low birth weight babies was observed with increasing fructosamine levels in the diabetic mothers. Women with diabetes have worse pregnancy outcomes as compared to non-diabetic mothers with and those with pre-gestational diabetes fare worse than those with gestational diabetes. According to American Diabetes Association (ADA); GDM is a common condition affecting 7% of all pregnancies. (Resulting in more than 20,000 cases) GDM is defined as impaired glucose tolerance that begins or is first detected during pregnancy. Depending on the population sample and diagnostic criteria, the prevalence range from 1-14%. It is estimated that both fetal and maternal complication associated with GDM. Patient should be screened for risk factors for GDM at their initial visit. Babies born to mothers with GDM are typically at increased risk of complications such as being large for gestational age (which causes complications during delivery), low blood sugar and jaundice. A study (20011) was conducted on "Beliefs about health and illness in women managed for gestational diabetes in two organizations. "The objective was to explore beliefs about health, illness and health care in women with gestational diabetes mellitus (GDM) managed in two different organizations based on diabetology or obstetrics.: an explorative qualitative study using semi-structured interviews.: clinic A: a specialist diabetes clinic with regular contact with a diabetologist and antenatal care provided by a midwife; clinic B: a specialist maternity clinic providing regular contact with a midwife, a structured programme for self-monitoring of blood glucose and insulin treatment, and a 1-day diabetes class by an obstetrician, a diabetologist, a midwife and a dietician. 13 managed in clinic A and 10 managed in clinic B. All respondents reported a delay in the provision of information about GDM and an information gap about GDM and the management of the condition, from diagnosis until the start of treatment at the specialist clinic. Respondents from clinic an expressed fear about future development of type 2 diabetes. Women from clinic B discussed different causes of GDM, and many claimed that health-care staff informed them that GDM was a transient condition during pregnancy. It is important to recognize the context of information given on GDM, as it will substantially influence the beliefs and attitudes of women towards GDM as a transient condition during pregnancy or as a potential risk factor for diabetes.

OBJECTIVES OF THIS STUDY

1. To identify the knowledge regarding gestational diabetes mellitus among the antenatal mothers.
2. To determine the effect of teaching of gestational diabetes mellitus among antenatal mothers.
3. To correlate the association between level of knowledge and selected demographic variables among the gestational diabetes antenatal mothers.

REVIEW OF LITERATURE

- **Literature related to knowledge regarding GDM**

Bijoya Islam et al, (2017) conducted a study on knowledge and attitude regarding gestational Diabetes mellitus (GDM) among obese pregnant women coming for antenatal check-up at a tertiary care hospital the study is based on the primary data collected from the selected hospital. A total of 107 respondents were taken from OPD of Gynaecology at Holy family Red Crescent Medical college Hospital. The field survey was conducted the respondents majority 38.3% were at their third trimester of pregnancy and among the respondents (Obese pregnant women) 52.3% have positive familial history. 10.3% have GDM in their current pregnancy and the prevalence of previous GDM was 12.3% among 65 multigravida. Majority 29.9% delivered baby through caesarean section. Among the respondents 6.5% have positive family history of Gestational Diabetes Mellitus. Out of 107 respondents, it was reported that 83.3 are familiar with GDM.

David E, Dunger SH et.al (2014) conducted a study that pregnancies affected by GDM pose a risk for adversities such as the need for caesarean sections due to fetal macrosomia. Macrosomia occurs as a result of accelerated fetal growth fuelled by maternal hyperglycaemia. In approximately 95% of GDM cases maternal glucose metabolism returns to normal after delivery of the baby. GDM and the development of type 2 diabetes mellitus in the mother later in life exists. In addition, research into the long term effects of poor maternal glucose metabolism on the foetus has revealed that offspring born to mothers with GDM are susceptible to IGT and obesity. With these associations in mind it would be important to identify pregnant women at risk for GDM so that prevention management such as lifestyle modifications can be implemented.

Hosseini – Nezhad et al (2009) A conducted a study to assess the prevalence of GDM and pregnancy outcomes in Iranian women and found that there were 114 women (4.7%) who had GDM; women with GDM had a significantly higher parity and body mass index than non-diabetic women with GDM were also more likely to have a family history of diabetes and a history of poor obstetric outcome, of the 114, women, 27(23.6%) were younger than 25 years old, and 16(14.0%) had as recognizable risk factor for diabetes.

Courtens W et al (2014) conducted a study on Unilateral bowing of long bones and multiple congenital anomalies in a child born to a mother with GDM. This study was conducted in Nigerian center at Italy among 1000 mothers and the result showed that new born baby with multiple congenital anomalies consisting of major Skeletal anomalies restricted to the cleft palate, Ventricular and atrial septal defect, short neck, dysplastic low set ears and large birth weight and provide evidence that GDM could be teratogenic.

Mamta Bhatt et al (2010) conducted a case control study on determinants of gestational diabetes mellitus in a district tertiary care hospital in south India. The objective was to study the determinants of Gestational Diabetes Mellitus. It was a case-control study and conducted at Sri Avittom Thirunal Hospital, Thiruvananthapuram district, Kerala, South India. The study participants were 300 GDM women as cases and 300 age-matched controls. The study variables were socio demographic characteristics, pre-pregnancy Body Mass Index (BMI), menstrual history, obstetric history, infertility history, family history of diabetes in first degree relatives, recurrent urinary tract infection (UTI), and moniliasis. The statistical package are T- test, Fishers Exact Test, Chi square test, Adjusted Odds Ratio with 95% CI was used and the results were Pre-pregnancy BMI 25 ($P < 0.001$, OR = 2.7), irregular menstrual cycle ($P = 0.006$), treatment for infertility ($P = 0.001$, OR = 3.3), family history of diabetes ($P = 0.001$, OR = 4.5), history of diabetes in mother ($P = 0.003$), previous pregnancy losses ($P = 0.04$), past GDM ($P = 0.035$), prematurity ($P = 0.01$), pre-eclampsia ($P = 0.04$), polyhydramnios ($P < 0.001$, OR = 6.0), UTI ($P < 0.001$, OR = 3.2), and moniliasis ($P < 0.001$, OR = 7.6) were significantly associated with present GDM. To conclude this study early identification of women at risk of GDM and prompt treatment is recommended to prevent complications.

- **Literature related to planned health teaching**

Shakya S et al (2015) conducted a study on gestational diabetes mellitus and macrosomia. Fetal macrosomia, defined as a birth weight $\geq 4,000$ g, may affect 12% of new-borns of normal women and 15- 45% of new-borns of women with gestational diabetes mellitus (GDM). The increased risk of macrosomia in GDM is mainly due to the increased insulin resistance of the mother. In GDM, a higher amount of blood glucose passes through the placenta into the fetal circulation. As a result, extra glucose in the foetus is stored as body fat causing macrosomia, which is also called 'large for gestational age'. This paper reviews studies that explored the impact of GDM and fetal macrosomia as well as macrosomia-related complications on birth outcomes and offers an evaluation of maternal and fetal health.

Basu M et al (2018) conducted a study on maternal hyperglycaemia and fetal cardiac development. Clinical impact and underlying mechanisms. Congenital heart disease (CHD) is the most common type of birth defect and is both a significant paediatric and adult health problem, in light of a growing population of survivors. The etiology of CHD has been considered to be multifactorial with genetic and environmental factors playing important roles. The combination of advances in cardiac developmental biology, which have resulted in the elucidation of molecular pathways regulating normal cardiac morphogenesis, and genome sequencing technology have allowed the discovery of numerous genetic contributors of CHD ranging from chromosomal abnormalities to single gene variants. Conversely, mechanistic details of the contribution of environmental factors to CHD remain unknown. Maternal diabetes mellitus is a well-established and increasingly prevalent environmental risk factor for CHD, increases the vulnerability of embryos to cardiac malformations remains largely elusive. This increased understanding may open the door for the development of novel prevention strategies to reduce the incidence of CHD in this high-risk population.

Fong et al (2014). Conducted study on the high rate of incidences of gestational diabetes mellitus in Asian but indicated that the Asians along with the Caucasians have the lowest prevalence of pre gestational diabetes mellitus. The study discussed further that with the

increasing incidence of pre gestational diabetes mellitus and gestational diabetes mellitus, health related diseases like hypertension, renal disease; thyroid dysfunction, fetal CNS malformation, fetal demise, and eclampsia are also on the raise. The research cautioned that races with the highest predisposition for gestational diabetes mellitus during pregnancy might not necessarily have the highest tendency for pre gestational diabetes.

Xiang et al (2011) conducted the differences in diabetes mellitus risk after gestational diabetes mellitus by race and ethnicity. In a retrospective cohort study of women between the study identified gestational diabetes mellitus through plasma glucose level during pregnancy. Their research found out that there are discrepancies in the risk of diabetes mellitus by race and ethnicity. In addition, they discovered that black women diagnosed with gestational diabetes mellitus are more susceptible of developing diabetes mellitus than any other race. Also, effective gestational diabetes mellitus screening as well as prevention within this race is crucial in the control and prevention particularly among the black race.

Henderson et al. (2012) conducted a cohort study discovered that the age-adjusted occurrence of gestational diabetes mellitus varies and rise by increasing body mass index type. They also showed that Hispanics, non-Hispanic whites as well as the African Americans are at a higher prevalence of gestational diabetes mellitus. The research concluded that gestational diabetes mellitus risk might also be high in low body mass index among the Asians and Filipina women. They also concluded that Asian women stand to profit more from different preventive approach in addition to weight management.

EXPERIMENTAL SECTION

Material and method:

In present study, researcher adopted Experimental pre-test design for this study The study carried out 60 samples. Ethical clearance was taken. A Non-probability Purposive Sampling Technique was used. The significance was calculated by using mean, standard deviation, and calculated 't' value, and association was done by Fisher's exact test with demographic variable.

Description of Tool: The tool includes two sections:

Section – I: Demographic data:

It consisted of eight demographic variables including details regarding age, gravida, education, occupation, habit, associated medical illness, parity and gestation.

Section – II: Structured knowledge questionnaire regarding GDM.

Plan for Data Analysis:

The analysis was done by using the data of section-I and section-II and presents them in tables, graphs and figures.

For the analysis of demographic data frequencies and percentage was calculated. The significance was calculated by using mean, standard deviation, and calculated 't' value, and association was done by Fisher's exact test with demographic variable.

RESULT AND DISCUSSION

Analysis and interpretation of the data are based on data collected from 60 sample.

N=

60

Demographic variable	Freq	%
Age		
18 – 23 years	22	36.7%
24 – 28 years	20	33.3%

	29 – 34 years	18	30.0%
Gravida			
	Primi	34	56.7%
	Multi	26	43.3%
Education			
	Primary	21	35.0%
	Secondary	25	41.7%
	Graduate	14	23.3%
Occupation			
	Private sector	8	13.3%
	Government sector	2	3.3%
	Housewife	46	76.7%
	Labourer	2	3.3%
	Business	2	3.3%
Smoking			
Demographic variable		Freq	%
	No	60	100.0%
	Yes	00	00%
Misri			
	No	59	98.3%

	Yes	1	1.7%
Tobacco			
	No	60	100.0%
	Yes	00	00%
Parity			
	Zero	21	35.0%
	One	22	36.7%
	Two	17	28.3%
Gestation in weeks			
	1 to 12	21	35.0%
	13 to 28	21	35.0%
	29 to 40	18	30.0%

The sample distribution in table 1 shows that out of 60 samples majority 22 (36.7%) were between the age group of 18-23 years. 34 (56.7%) were primi gravid, having secondary education standard i.e. 25 (41.7%). 46 (76.7%) were doing housework and 2 (3.3%) were labourer and 2 i.e. (3.3%) were business women. None of the samples was found to be smoking and using tobacco 00 (100%). 01 i.e. (1.7%) samples were found

Section I

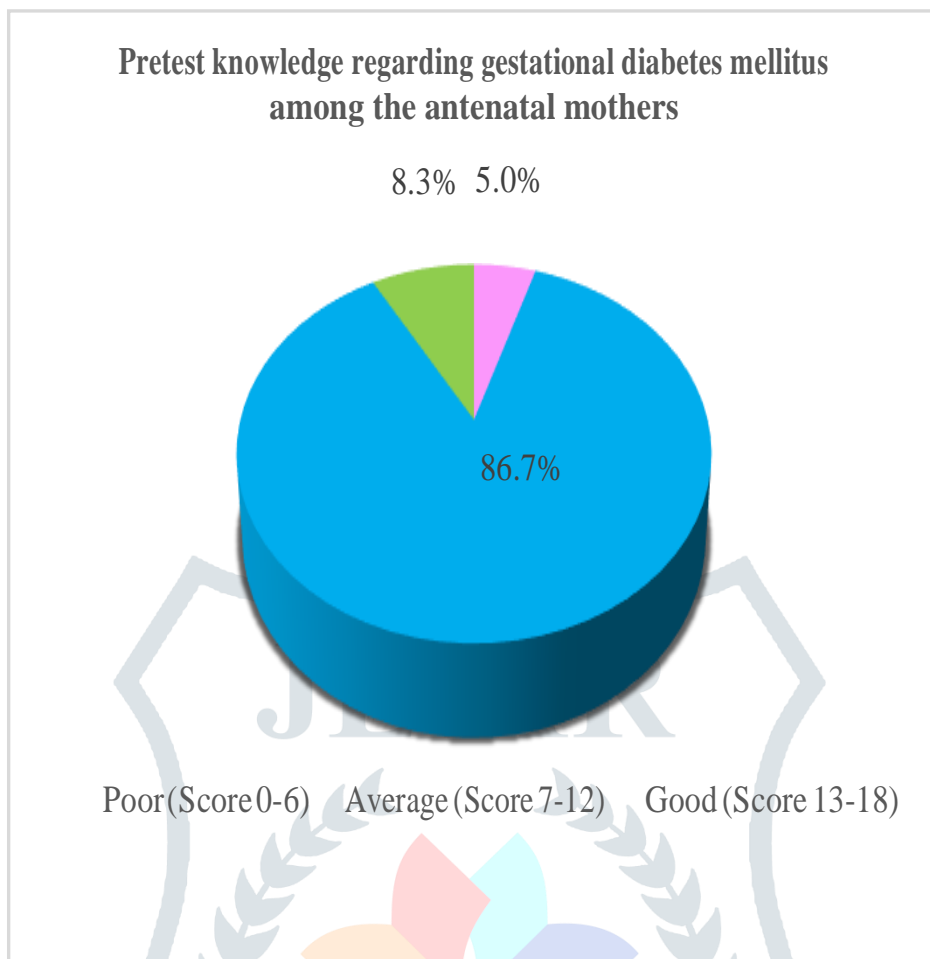
N=60

Demographic variable	Freq	%
Age		
18 – 23 years	22	36.7%
24 – 28 years	20	33.3%

29 – 34 years	18	30.0%
Gravida		
Primi	34	56.7%
Multi	26	43.3%
Education		
Primary	21	35.0%
Secondary	25	41.7%
Graduate	14	23.3%
Occupation		
Private sector	8	13.3%
Government sector	2	3.3%
Housewife	46	76.7%
Labourer	2	3.3%
Business	2	3.3%
Smoking		
Demographic variable		
	Freq	%
No	60	100.0%
Yes	00	00%
Misri		
No	59	98.3%

Yes	1	1.7%
Tobacco		
No	60	100.0%
Yes	00	00%
Parity		
Zero	21	35.0%
One	22	36.7%
Two	17	28.3%
Gestation in weeks		
1 to 12	21	35.0%
13 to 28	21	35.0%
29 to 40	18	30.0%

table 1 shows that out of 60 samples majority 22 (36.7%) were between the age group of 18-23 years. 34 (56.7%) were primi gravid, having secondary education standard i.e. 25 (41.7%). 46 (76.7%) were doing housework and 2 (3.3%) were labourer and 2 i.e. (3.3%) were business women. None of the samples was found to be smoking and using tobacco 00 (100%). 01 i.e. (1.7%) samples were found using Misri. Majority i.e. 22 (36.7%) samples had second time pregnancy. And out 60 samples 21 each i.e. (35%) found to be pregnant for 1-12 and 13-28 weeks.



Pie diagram Showing knowledge score regarding gestational diabetes mellitus among the antenatal mothers before administration of Plan Teaching.

Section II

Comparison knowledge regarding gestational diabetes mellitus among the antenatal mothers by using Frequency and Percentage.

N=60

Knowledge	Pretest		Posttest	
	Freq	%	Freq	%
Poor (Score 0-6)	03	5	0	0
Average (Score 7-12)	52	86.7	0	0
Good (Score 13-18)	5	8.3	2	3.3
Excellent (Score 19-25)	0	0	58	96.7

Table shows that majority of samples 52 i.e. (86.7%) were having average (7-12) knowledge and none of the sample was having excellent knowledge in pre-test regarding gestational diabetes mellitus whereas majority of samples 58 i.e. (96.7%) were having excellent (7-12) knowledge and minority 02 i.e. (3.3%) of the sample was having Good (13-18) knowledge in post-test regarding gestational diabetes mellitus.

Section III:

Knowledge test	Mean	SD	't' Value	Level of significance (df = 59)
Pre-test	9.8	2.1	40.0	0.000
Post-test	21.3	1.2		

$$t(59) = 1.96 \text{ P} < 0.000$$

Mean total of pre-test score of mother's knowledge on gestational diabetes mellitus is less than that of post-test.

Relationship between various demographic variables with pre-test knowledge score about gestational diabetes among antenatal mothers.

Demographic variable	Average	Good	Poor	p-value
Age	18 – 23 years	20	1	0.886
	24 – 28 years	16	3	
	29 – 34 years	16	1	
Gravida	Primi	32	2	0.047*
	Multi	20	3	
Education	Primary	17	4	0

		Secondary	24	1	0	0.006*
		Graduate	11	0	3	
Occupation		Private sector	6	1	1	0.075
		Government sector	2	0	0	
		Housewife	42	3	1	
		Labourer	1	1	0	
		Business	1	0	1	
Misri		No	52	5	2	0.050*
		Yes	0	0	1	
Parity	Zero		20	0	1	0.345
	One		19	2	1	
	Two		13	3	1	
Gestation in weeks		1 to 12	19	2	0	0.331
		13 to 28	17	3	1	
		29 to 40	16	0	2	

Above table depicts that p-values corresponding to Gravida, Education and Misri are small (<0.05). There is significant association between Gravida, Education and Misri. Whereas age, occupation, parity and gestation in weeks have insignificant association with pre-test knowledge score.

Discussion

The present study was designed A Study To Assess The Effect Of Planned Teaching On Knowledge Regarding Gestational Diabetes Among The Antenatal Mothers Admitted In Selected Hospitals. The study involved Experimental pre-test design for this study, Non-probability Purposive Sampling Technique. The size of the sample was 60.

Analysis of phase I revealed that majority ((36.7%) were between the age group of 18-23 years.(56.7%) were primi gravid, (41.7%) having secondary education standard and majority (76.7%) were doing housework. (100%) None of the sample was found to be smoking and using tobacco. Majority i.e. 22 (36.7%) samples had second time pregnancy. Out 60 samples 21 each i.e. (35%) found to be pregnant for 1-12 and 13- 28 weeks.

Conclusion

The 't' test done to find the significant effect of Plan Teaching on knowledge of GDM for antenatal mothers revealed that there is a highly significant gain in the knowledge. The correlation finding which was done to find the relationship with the selected demographic variables, was done by using 't' test. Educating people on GDM by plan teaching have significant effect in improving their knowledge. This was helpful for better prevention and treatment.

IMPLICATIONS

The finding of this study is implicated in following headings-

Nursing Practice:

When such plan teaching on each disease which has less cost and better effect for disease are made, will provide sound and comprehensive knowledge to practise better discharge planning and health teaching to patient. This will enable the client to care for self and also to maintain regular follow up visits.

Nursing Education:

Nursing education is developing rapidly in India. We are training the nurses to achieve an International standard. To achieve high level of educational standards the nursing education needs to be raised to a greater extent. This is achieved if all aspects of health need sare considered as a whole. The education curriculum must include preparation of such plan teaching. Diet plan, health teaching on various drugs, disease as a project work to help them to learn about various methods of health teaching to their clients. Hence, preparation of such project work can be included in the nursing education curriculum.

Nursing Administration:

As a part of administration, the nurse administrator plays a vital role in educating clients and student nurses. The Nurse administrator can utilize this type of plan teaching, material to enhance in the knowledge of student and staff nurses. And also discharge planning and education to client can be done in better manner.

Nursing Research:

Nursing research is an essential aspect of nursing as it uplifts the profession and develops new nursing norms and a body of knowledge. There is a need for extended and intensive nursing research in the area of health education and discharge planning for client to improve their knowledge for better compliance with the treatment and to prevent relapse.

LIMITATION

The following points were beyond the control of the Investigator:

A limited time available for data collection because of which pre and post-test were conducted on the same day that would have influenced the results of the study.

RECOMMENDATION

Keeping in view the findings of the study, the following recommendations are made:

1. It is suggested that the study may be replicated using a larger population of the antenatal mothers. Similar study can be replicated but interval between pre-test and post-test should be more than seven days.
2. A study may be conducted to evaluate the effectiveness of plan teaching versus other methods of health teaching on gestational diabetes mellitus in pregnancy.
3. A study can be done on association between various demographic variables, which were significant, on larger samples.
4. A study may be done to determine cost effectiveness of the plan teaching.

References

1. Noronha. J (2003).” Teaching prim gravida women about warning signs in pregnancy”, Indian Journal of Nursing, 8 (2): p. 91-93.
2. Vanishree shiraam, M Anitha Rani and Shiraam Mahadevan. “Indian Journal of Endocrinology and Metabolism”.
3. Hanne Melchior, et.al (2015)”The Prevalence of Gestational Diabetes.” 114(24):412-418.
4. Shiraam, V Rani Et.al (2013) “Awareness of gestational diabetes mellitus among antenatal women”. Indian J Endocrinal Metab 17: 146 - 148 <https://goo.gl/H3ZbXR>.
5. Gabbe S.G, et.al, New York, (2002). Obstetrics: “Normal and Problem Pregnancies”. Fourth edition
6. Metzger BE, Coustan DR (Eds.) (1998): “Diabetes care 21 (suppl 2): B1-B167.
7. Franz MJ et al. (1994).”Nutrition principles for the management of diabetes and related complications.” Diabetes Care 17:490–518.
8. Tulika Bose (2005) “Incidence of Gestational Diabetes in General Population.”17 (4) 251-254
9. Lowder Lowdermilk, Perry (1995) “Maternity Nursing”. 5th ed. PP 601-618.
10. Seshiah V, Das AK, Balaji V et.al (2007)” Gestational Diabetes Mellitus – Guidelines”. Vol 54 PP 622- 628.
11. Shefali AK, Kavitha M, Deepa R, Mohan V (2007) “Pregnancy outcome in pregestational and gestational diabetic women in comparison to non-diabetic women.” [Cited 2007 Aug 3]; 54’ [613-18].
12. American Journal (2004) “Epidemiology”. Vol 159, pg: 663-670.
13. Diabetes/ metabolism, research and reviews. “Prevention of GDM; a review of studies on weight management”; vol
14. V Ruth Bennet, Linda K Brown (2001). “Myles Textbook for Midwives”.13th ed. Harcourt Publishers.