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A study to determine the effectiveness of Planned Teaching Programme (PTP) on prevention of gestational diabetes mellitus (GDM) among antenatal mothers in selected PHC's at Mangalore

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Abstract

The present study was conducted to find out the effectiveness of planned teaching programme (PTP) on prevention of gestational diabetes mellitus (GDM) among antenatal mothers in selected PHCs at Mangalore. The purpose of this study to educate the antenatal mothers to take care of themselves at home and day to day activities to maintain stranger vigilance for early signs of GDM and its complications and seek medical aid immediately. However, there is lack of knowledge and practice regarding the preventive measures of GDM. This study is aimed at improving the knowledge of antenatal mothers on prevention of GDM. An evaluatory research approach with one group pre-test post test design was used for this study. The sample consisted of 50 antenatal mothers. Samples are selected by purposive sampling technique. The study was conducted in PHCs and Lady Goschen Hospital at Mangalore. Data were collected by administering structured interview schedule prior and after the administration of planned teaching programme. The collected data were analyzed by using descriptive and inferential statistics. Conceptual framework based on Rosenstoch's (1974) and Becker and Maiman's (1975) health belief model was used in this study.The study findings revealed that knowledge gained through PTP was good, as it was evident with high significance (t_{49}=22.8547, $p<0.05$) between the mean post-test (X_1 = 18) and pre-test (X_2 = 27) knowledge score. Area-wise pre-test and post-test knowledge score of antenatal mothers shows higher mean percentage score (92%) in the area of prevention and least mean percentage score (87%) in the area GDM. Paired't' test was used for the area wise comparison between pre-test and post-test knowledge score on prevention of GDM and was found to be highly significant. Chi-square was computed to test the association between pre-test knowledge score and selected demographic variables of antenatal mothers. However there was no significant association between the pre-test knowledge score and selected demographic variables like age, education, occupation, income and gravid at 0.05 level of significance. PTP is given through flip chart, charts, Power-Point and demonstration was found for an effective strategy for providing information and for improving the knowledge of antenatal mothers, and prevention of GDM. It was well appreciated and accepted by the antenatal mothers. The result of the study showed great need for health personnel to educate the antenatal mothers regarding prevention and promotion of health.

Keywords: Effectiveness; PTP; Prevention; GDM; Antenatal mothers

1. Introduction

Few life events are as wonderful, memorable, and defining as pregnancy. While the process of gestation has many common thread and themes for all women, each mother's experience is unique. Furthermore, the same woman may experience pregnancy differently each time that she goes through it. The pregnant woman's body undergoes tremendous hormonal and physical changes during the nine months prior to birth, the muscles, joints and tissues are

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challenged by the changes that occur in the child bearing years. Providing appropriate support for the pregnant client, as well as her partner, significant others and extended family and friends is one of the most important crucial aspects of quality collaborative health care.[1]Child bearing is a natural physiological event however this creative process is a challenge that may place the baby at risk.[2] The immediate medical causes of maternal deaths are well known and similar all over the world, conditions such as hemorrhage, infection, diabetes, hypertension and obstructed labour still takes a heavy toll. Gestational diabetes mellitus of pregnancy is common complications in expectant mothers in advanced years. Gestational diabetes mellitus responsible for hospital for hospital admission, induction of labour and there is an increase chance of mortality and morbidity rate seen in both mother and fetus. Gestational diabetes mellitus is one of the complications met with in pregnancy and contribute significantly to maternal perinatal morbidity and mortality. GDM is a type of diabetes that only women get. If a women gets diabetes when she is pregnant, but never had it before then she has GDM. The increasing development of GDM in the mother and glucose tolerance in the offspring set the stages for a perpetuating cycle that must be addressed with effective primary prevention strategies and more effective antepartum interventions. So one of the biggest challenges for nurses and other healthcare providers face the growing number of women developing gestational diabetes as the obesity epidemic escalates. GDM places the mother as well as the baby at increasing risks as pregnancy progresses.[2]If the mother had regular antenatal visits, the complications can be detected as early as possible and treatment taken accordingly. So the possible complications can be prevented to some extent and the mother can have a safe confinement and safe delivery without complications or minimized complications. Kim C, Newton KM, Knopp RH. Conducted the study to examine factors associated with variation in the risk for type II diabetes in women with prior GDM. The result shows as a total of 28 studies were examined after the index pregnancy, the cumulative incidence of diabetes ranged from 2.6% to 70%, in studies that examined women 6 weeks post partum period to 28 years. Cumulative frequency of type II diabetes increased markedly in the first 5 years after delivery and appeared to plateau after 10 years. An elevated fasting glucose level during pregnancy was the risk factor most commonly associated with future risk of type II diabetes. Based on different studies, the chances of developing GDM in a second pregnancy are between 30-84%, depending on the ethnic back ground. A second pregnancy within one year of previous as high rate of recurrence. And it also found an association between gestational diabetes and increased perinatal mortality rates. It affects 3-10% of pregnancies depending on the population studied, and GDM resolves once the baby is born.[4]Two trials (82 pregnant women) assessed low glycaemic index (LGI) versus high glycaemic index (HGI) diets for pregnant women. Women on the LGI diet had fewer large for gestational age infants. Women on the LGI diet gave birth to lighter babies (weighted mean difference (WMD) -445.55 g, 95% confidence interval (CI) -634.16 to -256.95). While a low glycaemic index diet was seen to be beneficial for some outcomes for both mother and child, results from the review were inconclusive.[5]There were no significant associations between GDM risk and occupational and active living activities during pregnancy. However, after controlling for age and pre-pregnancy body mass index (BMI), women in the highest quartile of pre-pregnancy (0.2, 95%) and mid-pregnancy (0.2, 95%) household/care giving activities as well as mid-pregnancy sports/exercise (0.1, 95%) had a reduced risk of GDM compared with women in the lowest quartile. So findings in this Hispanic population, although based on small numbers of cases, are consistent with prior research among predominantly non-Hispanic white populations.[6]

2. Material and methods

2.1. Research approach

An quantitative evaluative research approach was adopted for the study to evaluating the effectiveness of a planned teaching programme on prevention of GDM among antenatal mothers.s

The research design selected for the study is pre experimental design, i.e.; one group pre-test post-test design because this study was intended to ascertain the gain in knowledge by the clients who were subjected to planned teaching programme.

2.2. Setting of the study

The investigator selected Kadri PHC and Lady Goschen hospital to conduct the research study.

2.3. Sample and sample size

In this study sample consisted of 50 antenatal mothers who were visited to the Kadri PHC and Lady Goschen hospital.

2.4. Sampling technique

Purposive or judgmental sampling is based on the beliefs that a researcher's knowledge about the population can be used to handpick the cases to be in the sample.

2.5. Development of the tool

A structured interview schedule was developed by the investigator for assessing the knowledge of antenatal mothers regarding the prevention of GDM. For development of tool, research and non-research reviews of literature were viewed and suggestions of experts were taken to determine the areas to be included.

3. Results and discussion

3.1. Data collection procedure:

The investigator obtained permission from the Medical Superintendent prior to the data collection period. Data was collected from Lady Goschen hospital and the data collection period extended from 15.09.2009 to 22.09.2009.The investigator meets the respondents individually in the antenatal wards. The purpose of the study was explained to them and informed consent was obtained. Confidentiality was assured to all the subjects to get their co-operation. The pre-test was conducted by structured interview schedule, which was prepared in Kannada. Prior to the pre-test purpose of the study was obtained and informed consent was taken. The time taken to the pre-test was 30-45 minutes. The pre-test was conducted on 5 antenatal mothers. PTP was given to the same mothers individually on the same day of pre-test. Investigator used flash cards, chart and power point as well as demonstration to teach the prevention of GDM, ie; is definition and meaning, risk factors, clinical features, diagnosis, management, complications and preventive measures. The post- test was conducted on the 7th day after the administration of PTP with the same tool. All the interviews and administration of PTP were conducted by investigator herself. The investigator thanked and appreciated all the subjects. The collected data was compiled for analysis.

3.2. Plan for analysis of data

Data analysis is the systematic organization and synthesis of research data, and the testing of research hypotheses using those data.[7]Data will be analyzed using both descriptive and inferential statistics on the basis of hypotheses of the study. Baseline proforma containing sample characteristics would be analyzed using frequency and percentage. The knowledge of the mothers regarding the prevention of GDM before and after the administration of PTP would be calculated using mean, standard deviation and mean percentage. The significance difference between the mean pre-test and post-test knowledge score would be calculated using't' test. Further, statistical significance of the effectiveness of planned teaching program will be analyses using tables. Demographic data will be presented using table. Distribution of level of the knowledge of the pre university college teachers and area wise and item wise analyses of the knowledge scores and effectiveness will be presented using tables.

3.3. Organization of the findings

The collected data is organized and presented under the following headings;

3.3.1. Section I: Sample characteristics

Baseline proforma containing samples characteristics would be analyzed by using frequency and percentage.

3.3.2. Section II: Evaluation of PTP in-terms of gain in knowledge score

Evaluation of PTP in terms of gain in knowledge would be analyzed by descriptive statistics in terms of frequency, percentage mean and standard deviation.

3.3.3. Section III: Evaluation of effectiveness of PTP

Effectiveness of planned teaching programme would be analyzed by computing the mean, standard deviation and paired't' test.

3.3.4. Section IV: Association of knowledge score and demographic variables

The association between the pretest knowledge score and selected demographic variables would be analyzed by using chi-square test.

3.4. Section I: Sample characteristics

Sample characteristics include age, education, occupation, income, gravid, dietary pattern. The sample consisted of 50 antenatal mothers. The characteristics are depicted in table 1.

Table 1 Distribution of samples according to age, education, occupation, income, gravida, dietary pattern and any previous information regarding GDM in terms of frequency and percentage N=50

Sl. no.	Variables	Frequency (f)	Percentage (%)
Age (in years)	Below 20	1	2.0
	21-25	25	50.0
	26-30	22	44.0
	Above 30	2	4.0
Education	Illiterate	_	_
	Primary	19	38.0
	High school	25	50.0
	PUC	3	6.0
	Graduate and above	3	6.0
Occupation	House wife	13	26.0
	Coolie	30	60.0
	Private	7	14.0
	Government service	_	_
Income (per month)	<3000	28	56.0
	3001-4000	20	40.0
	4001-5000	2	4.0
	5000 and above	_	_
Gravid/ parity	Primigravida	30	60.0
	2nd gravida	15	30.0
	3rd gravida	4	8.0
	4th and above	1	2.0
Dietary pattern	Vegetarian	3	6.0
	Non-vegetarian	47	94.0
Previous information	Yes	_	_
	No	50	100.0

3.5. Section II: Evaluation of PTP in terms of gain in knowledge score

This section deals with the analysis and interpretation of the data with relevance to effectiveness of PTP on prevention of GDM among antenatal mothers.

The data concerning the effectiveness of PTP was established by analyzing the pre-test and post-test knowledge score of the respondents. It was analyzed by using descriptive and inferential statistics.

Data in table 2 show that (66%) of the antenatal mothers scored between16 – 20, and (16%) of them scored between 21 – 25, (14%) of them scored between 11 – 15 and (4%) of them scored between 26 – 30 in pre-test. In the post-test only (2%) of them scored between 16 – 20, none of them scored between 11 – 15 and majority (78%) of them are scored between 26 – 30 in post-test.

Table 2 Frequency and cumulative frequency (cum. freq) distribution of pre-test and post-test knowledge scoreN=50

Knowledge score	Pre-test			Post-test		
	Frequency	Percentage	Cum. freq.	Frequency	Percentage	Cum. freq.
11 - 15	7	14	7	_	_	_
16 - 20	33	66	40	1	2	1
21 - 25	8	16	48	10	20	11
26 - 30	2	4	50	39	78	50

Maximum score = 30

3.6. Section III: Effectiveness of PTP on prevention of GDM

In order to find out the significance of the difference between the pre-test and post-test knowledge score on GDM. Paired 't' test was computed and data is presented in table 3.

The null hypotheses (H_0) was stated to test the statistical difference between pre-test and post-test knowledge score on prevention of GDM.

H_0: There is no significant difference between mean pre-test and post test knowledge score of antenatal mothers on prevention of GDM at 0.05 level of significance.

Table 3 Mean, mean difference, standard deviation and't' value between pre-test and post-test knowledge score

Group	Mean knowledge score						
	Pre-test	Post-test	Mean difference	S.D.	S. D. error difference	df	't'value
Antenatal mothers	18.24	26.9	8.66	2.63601	0. 37279	49	22.8547*

$t_{49} = 2.008$; $p < 0.05$* significant

Table value t_{49} at 0.05 level of significance is 2.008. The't' value (22.8547) is greater than the table value (t_{49} = 2.008); hence H_0 is rejected and the research hypothesis (H_1) is accepted.

3.7. Section IV: Association between the pre-test knowledge score of antenatal mothers with selected demographic variables.

To test the association between pre-test knowledge score and selected variables, the following hypothesis was formulated:

H_0: There is no significant relationship between pre-test knowledge score of antenatal mothers and selected variables such as age, education, occupation, income and gravida or parity at 0.05 level of significance.

Chi-square was computed to test the hypothesis in table 4.

Table 4 Chi-square (χ^2) value between the level of pre-test knowledge score and selected demographic variables

Sl. No.	Variables	Knowledge score		df	Chi-square value (χ^2)
		≤Median (≤18)	>Median(>18)		
1.	Age (in years)			1	0.0805*
	≤ 25	13	12		
	≥ 26	14	11		

2.	Education			1	0.9952*
	High school & below	20	14		
	PUC & above	7	9		
3.	Occupation			1	0.0137*
	House & coolie	9	5		
	Private & govt. service	17	19		
4.	Income(monthly)			1	0.0287*
	≤ 4000	20	9		
	≥4001	7	14		
5.	Gravida / parity			1	0.0412*
	≤ 2ndgravida	22	5		
	≥ 3rdgravida	23	0		

$\chi^2_{(1)} = 3.84$; $p<0.05$* Not significant

The computed chi-square value shows no association between pre-test knowledge score with selected variables such as age, education, occupation, income and gravida or parity at 0.05 level of significance. Therefore, the null hypothesis (H_0) was accepted and research hypothesis (H_1) was rejected.

4. Conclusion

The modern philosophy of maternity nursing is a family centered maternity care which focuses on preventive and promotion care to the gravid mothers. Emphasis is given to prenatal care in order to have a safe, natural and uncomplicated child birth. Midwives are in unique position to foster positive health of women during prenatal period. Delivery of health programme can be done through effective educational strategy to meet the needs of the illiterate and literate women. A PTP will help the gravid women to gain knowledge about prevention and they will benefit by it. The following conclusions were drawn based on the findings of the study are;

- A high percentage of antenatal mothers were less than 24 weeks of gestation infers the prominence of early diagnosis of GDM.
- A proportion among various work patterns indicated GDM, antenatal mothers to be a moderate worker and mostly a heavy worker.
- Among demographic variables the age, education exhibits its relation with knowledge gain.
- The pre-test finding shows that deficit knowledge regarding prevention and management of GDM among antenatal mothers in all areas of learning.
- The PTP tested in the study was found to be effective in improving the knowledge on prevention of GDM among antenatal mothers.
- The PTP is an effective teaching method for providing information. It is noted that PTP is very much appreciated, encouraging as well as satisfying by the antenatal mothers. The post-test score showed an increase in knowledge in all areas of prevention of GDM among antenatal mothers. They suggest that to give such information regarding the other disease condition during pregnancy and its prevention.
- There is no relationship between the demographic variables such as age, education, occupation, gravida, income, dietary pattern and previous information with that of gain in knowledge.
- Antenatal mothers who were exposed to PTP were able to maintain preventive measures within normal limits as compared to others.
- Antenatal mothers could be taught about the GDM and its self care management by administrating PTP.

Thus the finding indicates that PTP on prevention of GDM among antenatal mothers is effective in increasing the knowledge and thus prevention of complications. The tested hypotheses of this study are thus accepted.

Compliance with ethical standards

Statement of ethical approval

The present research work does not contain any studies performed on animals/humans subjects by any of the authors'.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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