EFFECT OF HEALTH EDUCATION PROGRAMME ON KNOWLEDGE OF GESTATIONAL DIABETES AMONG ANTENATAL MOTHERS IN GENERAL HOSPITALS KATSINA STATE, NIGERIA

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Abstract

This study investigated the impact of health education on knowledge of gestational diabetes among antenatal mothers in General hospitals, Katsina State, Nigeria. Quasi experimental design was used for the study. A sample of 65 diabetic antenatal mothers were purposively selected from a total population of 281 diabetic antenatal mothers from the study area. An instrument was adopted by a researcher titled: Semi structured Knowledge questionnaire on gestational diabetes care and management (SKQGCM) was duly validated by expert and a reliability coefficient (r) of 0.82 was obtained. Null hypothesis one and two were tested using inferential statistics of analysis of covariance (ANCOVA) at 0.05 level of significance and multiple regression respectively. The findings from the research indicates that the participants in both experimental and control group were of significantly similar in the level of knowledge at pretest level. Likewise, there is significant difference between post-test mean score knowledge of gestational diabetes among the antenatal mothers in the experimental and control group in favor of experimental group ($F(1, 79) = 358.602$, $p = 0.00$). There is also a significant association between the post-test mean scores of knowledge and the demographic variables of the respondents in the experimental group $F(7, 32 = 10.404$, $p(0.000) < 0.05$. The following recommendations were drawn from the findings among others that, health care providers should incorporate structured, evidence-based educational interventions into regular antenatal care visits. These programs should focus on gestational diabetes awareness, including its risk factors, prevention, and management strategies.

KEYWORDS: Health education programmme, Knowledge, Gestational diabetes, Antenatal mothers

INTRODUCTION

Gestational diabetes is defined as carbohydrate intolerance resulting in hyperglycemia of variable severity with onset or first recognition during pregnancy (WHO, 1999) or as any degree of glucose intolerance with onset or first recognition during pregnancy (American Diabetes Association, 2004). It is one of the most common medical problems found in pregnancy.1% to 14% of total pregnancies may be affected by it (American Diabetes Association, 2002). Categorizing a woman having gestational diabetes with a glucose tolerance test (GTT) identifies were the top5–10% of a continuum of risk for certain adverse pregnancy outcomes. Women with gestational diabetes are themselves very likely to ultimately develop type 2 diabetes. In addition, the offspring of women with gestational diabetes have a greater risk of childhood obesity, glucose intolerance, and diabetes in early adulthood. The risk factors for the development of gestational diabetes are well established,

but of the major ones, only maternal obesity is potentially preventable or reversible (Robert, et al. 2009).

Some notable symptoms of gestational diabetes are increased of thirsty, frequent urination, increased hunger, fatigue, blurred vision, unexpected weight loss, sores that do not heal among others. Gestational diabetes is associated with adverse outcomes such as increased risks of maternal pre-eclampsia or eclampsia, maternal cardiovascular disease, maternal type 2 diabetes, fetal macrosomia, preterm delivery, caesarian section, birth trauma, infant born large for gestational age, infant respiratory distress, cardiac malformations in neonate (Ye, Luo, Huang, Li, & Liu 2022).

Risk factors of gestational diabetes include advanced maternal age, overweight or obesity, family history of type 2 diabetes, and a previous pregnancy without gestational diabetes that was complicated by hypertensive disorders, perinatal mortality, maternal obesity, or fetal macrosomia (Juan, Yang 2020).

The management of gestational diabetes requires different approach and includes both non-pharmacologic and pharmacologic interventions (Zhang, Zhou, Zhong, Wang, Ding &Li 2019). The non-pharmacological intervention include: daily self-monitoring of fasting and post prandial blood glucose levels, dietary modifications and monitoring of nutrition, exercise and physical activity, maternal weight gain management, and other lifestyle modifications (Lende & Rijhsinghani, 2020). The pharmacologic interventions requires the use of insulin or oral hypoglycemic agents such as metformin or glibenclamide (Lende & Rijhsinghani, 2020).

Currently, the World Health Organization (WHO) does not recommend the use of different diagnostic criteria between pregnant women and non- pregnant women. In early pregnancy (during the first trimester and the first half of second trimester) fasting and post prandial glucose are usually than in non- pregnant women (American Diabetic Association, 2018). Whereas the second half of the pregnancy is characterized by insulin resistance. Indeed, in a non- diabetic women, the normal insulin production balances the insulin resistance and maintain normal glucose level. Balancing the physiologic resistance is harder in women with pre-existing hyper-insulin conditions (e.g. overweight, obesity, polycystic ovary syndrome or metabolic syndrome). They are the ones that typically show a higher risk of developing gestational diabetes during second and third trimester of pregnancy. American diabetes association in 2018, recommends these targets for pregnant women

who test their blood sugar to be 95mg/dl or less before meal, 140mg/dl or less an hour after meal and 120mg/dl or less two hours after meal. Some notable symptoms of gestational diabetes include; frequent urination than usual, increase in thirsty, feeling of extreme hunger and eat more than usual, excess sweeting, loss of weight, blurred vision, and fatigue.

The global prevalence of gestational diabetes is 14% (International Diabetes Federation, 2021). The prevalence of gestational diabetes in Africa was reported as 13.6% (Muche, Olayemi & Gete, 2019). In 2021, a study conducted in the department of obstetrics and gynecology university collage Ibadan Nigeria found out that the prevalence of gestational diabetes in Nigeria was 0.5-38%. Also the study shows that the prevalence of gestational diabetes varies slightly from one geo-political zone to the other. Prevalence of gestational diabetes is the highest (16%) in the north central zone including the Federal Capital Territory, Abuja and the lowest (7%) in the south-south.

Knowledge is conceptualized as a set of information individuals need to master to administer their health condition. Only knowledge is not enough, however, to promote behavioral change, which also involves other variables, including: education, diagnosis time, health and disease-related beliefs, family support, easy access to health services, among other dimensions. Although knowledge is a pre-requisite for self-care, it cannot be the sole and main factor involved in the educative process. Knowledge combined with decision making shared with patients, according to their values, in addition to perceived self-care barriers, motivation and proposed targets, can lead to the adoption of positive attitudes towards treatment. Thus, it is perceived that low knowledge levels and negative attitudes towards the disease are factors that still interfere in metabolic control and treatment adherence.

Health education programmes are interventions that seek to improve individual's knowledge, attitudes, beliefs, and behaviors related to health (Simons-Morton et al., 2010). Health education programs are systematic, planned interventions that involved teaching individuals, groups, or communities about health -related topics with the goal of promoting health and preventing disease (Mc Kenzie et al., 2017). Health education programs aim to promote health and prevent disease through the dissemination of knowledge and the development of skills and attitudes that enable individuals to make informed decisions and take action to improve their health (Green, & Kreuter, 2005). Health education programs encompass a range of educational strategies and interventions that aim to empower individuals and communities to take control of their health, prevent disease,

and promote well-being (WHO, 2012). It therefore shows that health education programs should be comprehensive, culturally sensitive, and tailored to the specific needs of pregnant women. This could be through provision of knowledge, skills and support, these programs can contribute in reducing the prevalence of gestational diabetes and improving the overall health and well-being of pregnant women.

Uchenna (2020), conducted a study on the effect of Diabetes education program on Gestational diabetes Knowledge among Diabetic pregnant women in Nigerian Hospitals. The study was based on pre-test and post-test measures of experimental research design involving experimental (n=110) and control (n=110) groups. A total of 220 diabetic pregnant women were purposely recruited from public hospitals in Nigeria between October and December 2019. The results revealed that no statistically significant difference existed on gestational diabetes history (P=0.801>0.05), smoking habit (P=0.0615>0.05), parity status (P=0.503>0.05), and level of education (P=0.720>0.05), while difference was observed on alcohol status (P=0.011<0.05), and age by birth (P=0.009< 0.05). Also, while no significant difference existed between the diabetic pregnant women in the treatment and control groups on gestational diabetes knowledge pretest measures (P=0.901>0.05), difference existed between the diabetic pregnant women in the intervention and control groups on gestational diabetes knowledge posttest scores (P=0.026<0.05). Also, the higher percentage score (78%) of diabetic pregnant women in the experimental group in the posttest gestational diabetes knowledge measures which is higher than the score in the pretest measures (55%) of the same group were indications that diabetic education program has significant effect on gestational diabetes knowledge among diabetic pregnant women.

Safaah et al. (2019) carried out a research on the effect of educational program for health literacy among pregnant women with gestational diabetes in Egypt. Quasi-experimental design was used. 50 pregnant women with gestational diabetes between 28-36 weeks were interviewed for assessment of their knowledge. The participants in the study were aged from (20 <30) years old, the common were presence of multiple women degree relatives with diabetes mellitus in 22(44%) women followed by presence of multiple risk factor in 12(24%) the difference in levels of pre and post-test knowledge before and after education score resulted in significant improvement (p<0.001). The used of educational program resulted in significant improvement (P. value <0.001) of maximum score of knowledge after receiving the educational program, while found no

significant statistical difference between moderately and well-educated studies women for maternal and fetal outcomes. The study concluded that, the educational intervention in the present study, was significantly effective on knowledge and attitude of pregnant women with gestational diabetes.

Objectives of the Study

The objective of this study is to;

1. To establish pre-test and post-test measures of antenatal mother's knowledge on gestational diabetes care and management in the control and experimental group.

2. To examine the association of post- test scores of knowledge with the demographic variables of the respondents in the experimental group.

Research Questions

The following research question was answered;

1. Is there a difference between control and experimental group's knowledge scores on gestational diabetes among the antenatal mothers?

Research Hypothesis

The following are the hypothesis formulated for this study;

1. There is no significant difference between pre-test and post-test mean score knowledge of gestational diabetes among the antenatal mothers in the experimental and control group.
2. There is no significant association between the post-test mean scores of knowledge and the demographic variables of the respondents in the experimental group.

METHODOLOGY

Research Design

A quasi- experimental (pre-test/post-test) design was utilized in this study. The effect of independent variable (Health education programme) on the dependent variable (Knowledge) was assess.

Population

The population of this study comprised 281 medically registered diabetic antenatal mothers in the fourteen (14) General hospitals of Katsina State, Nigeria within the period of September to November, 2024 (Katsina State Hospital Service Management Board, 2024).

Sample and Sampling Technique

The sample for this study comprised 65 diabetic antenatal mothers purposively selected from the two General Hospitals (Batsari and Mani GH) of Katsina State, Nigeria. Mani General Hospital with 40 diabetic antenatal mothers was placed under experimental group while Batsari General Hospital with 25 diabetic antenatal mothers was placed under control group as shown below. Mani and Batsari general hospitals were selected to be the sample of the study because they have high number of medically registered diabetic antenatal mothers and the antenatal mothers in these selected hospitals are willing to participate in the study and are in stable condition.

Instrumentation

Semi Structured knowledge questionnaire was used as research tool in this study which was adopted from Hussain (2015). The questionnaire is a 4-point Likert scale consist of strongly agree, agree, disagree and strongly disagree. Face and content validity of the questionnaire was obtained from the experts in the field of psychometric, nursing, medicine, health education and bio-statistics. Reliability of the instrument was established through test-retest procedure which yielded 0.82 coefficient.

Data analysis

Inferential statistics of analysis of covariance (ANCOVA) at 0.05 level of significance and multiple regression analysis were used to test the hypothesis one and two respectively.

RESULTS

Hypothesis one

Ho_1: There is no significant difference between pre-test and post-test mean score knowledge of gestational diabetes among the antenatal mothers in the experimental and control group.

To test hypothesis one, the scores of experimental and control group were subjected to Analysis of Covariance (ANCOVA). The result is presented Table 2:

Table 1: Pre-test Result

Variable	Group	Mean	SD	df	t-value	P-value
Pre-test Knowledge	Experimental	18.55	3.769	78	0.516	0.607
	Control	19.00	4.026			

The table indicated that p- value for knowledge scores of diabetic antenatal mothers obtained was 0.607, since the p-value was greater than the alpha value of 0.05, this implies that the participants in both experimental and control were of significantly similar in the level of Knowledge before the intervention (pre-test level).

Table 2: ANCOVA of the Post-Test Mean Scores for Knowledge of Gestational Diabetes among the Antenatal Mothers of the Experimental and Control Groups

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	16074.460[a]	2	8037.230	179.930	**.000**
Intercept	3640.235	1	3640.235	81.494	**.000**
Pre-knowledge	.010	1	.010	.000	**.988**
Group	16018.283	1	16018.283	358.602	**.000**
Error	3439.490	77	44.669		
Total	109428.000	80			
Corrected Total	19513.950	79			

R Squared = .824 (Adjusted R Squared = .819)

Table 2 revealed that the F-value computed was 358.602; adjusted R Squared observed was 0. 819 and the p-value of 0.000 was observed. Since the obtained p-value of 0.000 is less than the alpha value of 0.05, thus the study rejected the null hypothesis one (1) that says there is no significant difference between pre-test and post-test mean score knowledge of gestational diabetes among the antenatal mothers in the experimental and control group. The decision implies that, there is

significant difference between pre-test and post-test mean score knowledge of gestational diabetes among the antenatal mothers in the experimental and control group in favor of experimental group. This indicated that intervention has significant effect on knowledge of gestational diabetes among the antenatal mothers ($F_{(1, 79)} = 358.602$, $p = 0.00$).

Hypothesis two

H_{02}: There is no significant association between the post-test mean scores of knowledge and the demographic variables of the respondents in the experimental group

Table 3: Multiple Regression Analyses on Association between the Post-Test Mean Scores of Knowledge and The Demographic Variables of the respondents in the Experimental Group

Model		**R**	**R Square**	**Adjusted R Square**	**Std. Error**	
1		.834[a]	.695	.628	4.981	
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	1806.618	7	258.088	10.404	**.000[b]**
	Residual	793.782	32	24.806		
	Total	2600.400	39			

Table 3 indicated that the R square (called the coefficient of determination) tells the proportion of variance in the dependent variable (Knowledge) that can be explained by variation in the independent variable (academic performance). The table indicates 62.8 % of variation in the outcome variable by the predictor (demographic variables). However, the F-ratio in the table shows that the independent variable (demographic variables) statistically significantly predict the dependent variable (Knowledge) ($F_{(7, 32)} = 10.404$, $p < 0.05$). Hence the hypothesis that says there is no significant association between the post-test mean scores of knowledge and their demographic variables in the experimental group was rejected. The decision implies that there is a significant association between the post-test mean scores of knowledge and their demographic variables in the experimental group. Meanwhile knowledge of antenatal mothers in the experimental group significant association with their demographic variables.

DISCUSSION

The findings of this research indicated there is significant difference between pre-test and post-test mean score knowledge of gestational diabetes among the antenatal mothers in the experimental and control group in favour of experimental group. The finding that there is a significant difference between the pre-test and post-test mean scores of knowledge about gestational diabetes among antenatal mothers in the experimental group compared to the control group, with a higher score in the experimental group, underscores the effectiveness of the intervention employed in the experimental group. This suggests that targeted educational interventions, when appropriately designed and implemented, can significantly improve knowledge levels about health conditions such as gestational diabetes. However, the experimental group's higher post-test mean score demonstrates that the intervention, likely a structured educational program, was effective in enhancing knowledge about gestational diabetes.

The result aligns with studies of Dhanalakshmi et al. (2010), Josan (2015), Safaah et al. (2019) and Uchenna, (2020), indicating that health education programs improve knowledge and understanding of gestational diabetes among antenatal mothers. The findings of this study support the integration of tailored educational programs into routine antenatal care. Using diverse teaching methods, such as visual aids, interactive sessions, and culturally sensitive materials, can further enhance learning (WHO, 2021). The significant difference suggests that the intervention was not only effective but also statistically reliable, strengthening the argument for its adoption in similar populations.

The finding that there is a significant association between the post-test mean scores of knowledge with demographic variables in the experimental group provides valuable insights into the dynamics of educational interventions and their impact. However, the significant association between knowledge with demographic variables such as Gestational age, Religion, Residence, Ethnicity, Age in years, Parity, Educational status is not surprising. Previous studies by Song, and Sun, (2022) have shown that individuals from higher educational backgrounds or with more prior knowledge tend to have better understanding and more positive perceptions about health conditions like gestational diabetes. These findings suggest that certain demographic factors, such as education and age, may influence how effectively individuals absorb and internalize health-related information.

CONCLUSION

Based on the findings of this research, it can be concluded that, significant difference in the post-test mean scores between the experimental and control groups which highlights the effectiveness of the intervention in improving antenatal mothers' knowledge of gestational diabetes. This finding underscores the value of targeted, structured educational programs as an integral component of antenatal care. The findings also revealed that demographic variables significantly influence the post-test knowledge scores of antenatal mothers in the experimental group. This suggests that factors such as age, education, and socioeconomic status may shape how effectively participants absorb and internalize knowledge and form attitudes about gestational diabetes.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations were made:

1. Healthcare providers should incorporate structured, evidence-based educational interventions into regular antenatal care visits. These programs should focus on gestational diabetes awareness, including its risk factors, prevention, and management strategies.
2. Health facilities should design and implement structured educational programs focused on gestational diabetes. These interventions should use culturally appropriate content, interactive methods, and multimedia tools to effectively enhance knowledge among antenatal mothers.

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