Mobile Application (App) Intervention on Knowledge and Practice Regarding Self Care Management among Mothers with Gestational Diabetes Mellitus (GDM): A Quasi- Experimental Study

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ABSTRACT

Background: Gestational diabetes mellitus is an important health problem in our country due to its high incidence as well as its enormous possibility for diabetes prevention. The fact that diabetes in pregnancy is a major cause of the increasing outbreak of type 2 diabetes mellitus (T2DM) and it has turned to concentrate its consideration for the antenatal mother as a vital goal for diabetes avoidance strategies. **Materials and Methods:** A total of 100 Mothers who had fulfilled the inclusion criteria were selected and assigned randomly to the Experimental and Control group. Data were collected from the mothers by using a semi-structured questionnaire to assess the knowledge about self-care management and a checklist used to assess knowledge on practice about self-care management of GDM. **Results and Conclusion:** The pre-test level of knowledge on self-care management 35 (70%) mothers had adequate knowledge and regarding knowledge on practice about self-care management 39(78%) mothers had moderate knowledge on practice in the experimental group whereas in the control group 39 (78%) mothers had adequate knowledge and regarding knowledge on practice about self-care management 46(92%) mothers had good knowledge on practice. The post-test level of knowledge on self-care management 40 (80%) mothers had very good knowledge and regarding on practice about self-care management 47(94%) mothers had good knowledge on practice in the experimental group whereas in the control group 35(75%)mothers had adequate knowledge and regarding knowledge on practice about self-care management 40(80%)mothers had moderate knowledge on practice. Hence, the Mobile application intervention was found to be effective in improving the knowledge and knowledge of self-care management among GDM mothers.

1. INTRODUCTION

Gestational Diabetes Mellitus (GDM) is defined as glucose intolerance in women with the onset and first identification between 24 to 28 weeks of gestation [1].

It is estimated that 7% of all pregnancies are problematical by GDM expected to have more than 200,000 cases yearly. The occurrence of GDM may vary from 1 to 14% depending on the residents considered and the investigative tests used [2].

Gestational diabetes mellitus is one of the serious problems in pregnancy, currently, 5 - 14% of antenatal mothers are impacted with GDM based on the community group examined. Definite findings put forward that the incidence of GDM will radically rise shortly due to the increasing occurrence of obesity and glucose intolerance in adult women in developed countries [3].

Gestational diabetes is not only caused by the insufficient amount of insulin but also due to the dangerous factors which comprise overweight, history of diabetes in a previous pregnancy, family history of type II diabetes, and polycystic ovarian syndrome [4]. According to the National Institute of Diabetes and Digestive and Kidney Disease (2014) Identification of GDM is done by blood tests. For pregnant at normal risk, screening is suggested between 24 and 28 weeks gestation and for high-risk testing may do at the first antenatal visit.

Even though the greater occurrence of GDM has caused a severe impact for the health organization around the world but supportive studies are signifying that appropriate treatment results in a better outcome for both mother and baby. Therefore, the mother should be provided with health education on diabetes self-care based on the national standards after identification and according to their need [5].

Effective therapy in most mothers is diet and exercise. Carbohydrate control has been shown to improve glycemic control in the diet to control GDM and encourage mothers to check their glucose level 4 times daily [6].

A smartphone application helps to get away from ensuring health information and may aid in blood glucose control for mothers with GDM. Android apps as medical devices are new tools in the treatment of all types of diabetes. Mothers with GDM will be having more need for information than patients with type 1 or 2 diabetes. Although mobile technology can have more

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favorable for getting health information and its restrictions must be also taken into account for meeting the needs of target groups [7].

The utilization of mobile phones is growing worldwide. It is expected that in 2020, 90% of the worldwide population will possess mobile phones. In 2015, about 94% of the population aged between 25 and 45 years owned a smartphone with internet access offering opportunities for broad use of mobile apps including health apps. A study showed that users of health apps were healthy, young, higher-educated persons with a higher income [8].

2. MATERIALS AND METHODS

2.1. Study Design

A Quasi-Experimental study adopting a Pre-test and Post-test with a Control group design was conducted at the RGGWCH in Puducherry, India. The study was conducted for 30 days from 04/11/2019 to 3/12/2019.

2.2. Study Participants

The study participants included the antenatal mothers with Gestational Diabetic Mellitus attending the outpatient departments and admitted in antenatal ward RGGWCH, Puducherry. A total of 100 mothers who had fulfilled the inclusion criteria were selected using the purposive sampling technique and assigned randomly to the Experimental and Control group. A questionnaire for collecting the demographic & obstetric variables and other tools include a semi-structured questionnaire to assess the knowledge, a checklist on knowledge on practice regarding self-care management of GDM, and a structured questionnaire on the utilization of the mobile application.

2.3. Data Collection

The formal permission was obtained from the hospital authority to do the data collection. The researcher introduced herself to the mothers. The purpose of the study was clearly explained to the mothers and also assured that the collected data will be maintained confidentially. Informed written consent was obtained from the individual mothers before the data collection.

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 The data were collected in three phases. In Phase 1, the pre-test was done. On each day, around 4-5 mothers were selected for data collection. It took around 10 – 15 minutes for each mother.

In Phase 2, on the same day of pre-test mobile application was installed on the smartphone of mothers in the experimental group. It took around 5-10 minutes.

In Phase 3, among the experimental group post-test was carried out and in the control group pre-test test was done on day 1, and a post-test was carried out. The researcher follow-up the mothers in antenatal OPD and ward. The collected data were analyzed using descriptive and inferential statistics.

RESULTS AND DISCUSSION

To distinguish between the groups, the chi-square test was carried out between the pre-test levels of wound status. The non-significant 'p' value (0.0567) at $p<0.05$ level indicated that there was no significant difference in the level of wound status between the Experimental and Control group before the intervention, which means that both the groups were homogenous before the intervention.

From Figure 1 & 2 it can be observed using Mobile applications there was an improvement in the knowledge and knowledge on practice regarding self-care management in the Experimental group.
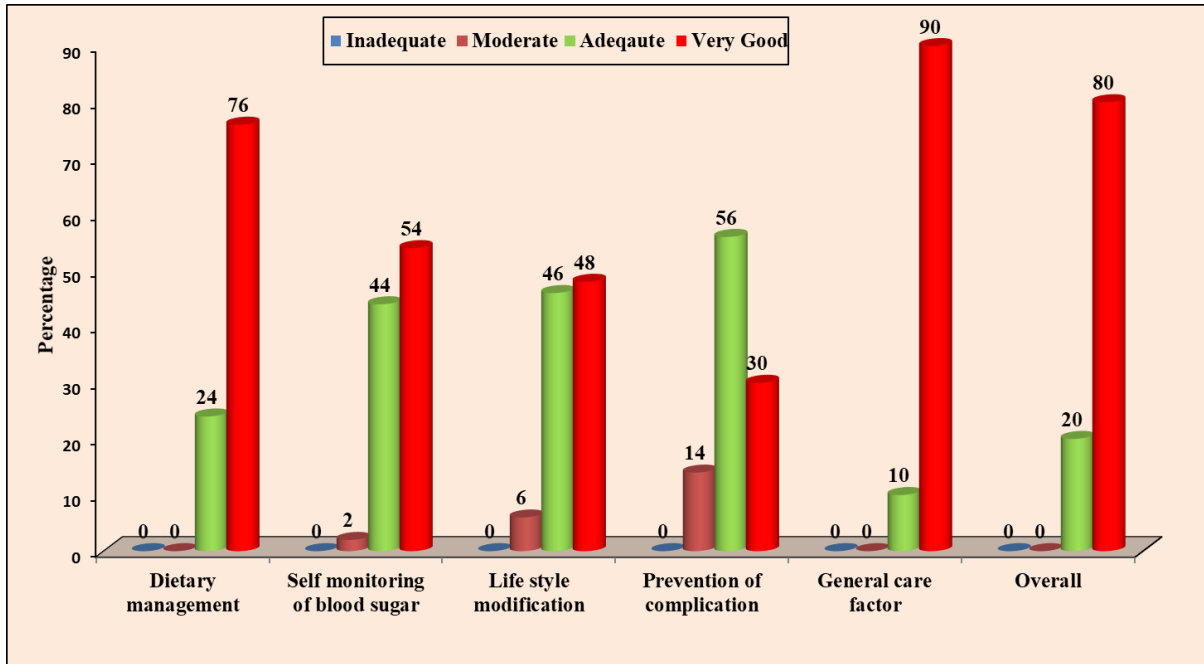
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Figure No. 1: Percentage Distribution of Post-test level of Knowledge about Self Care Management among Mothers with GDM in the Experimental group

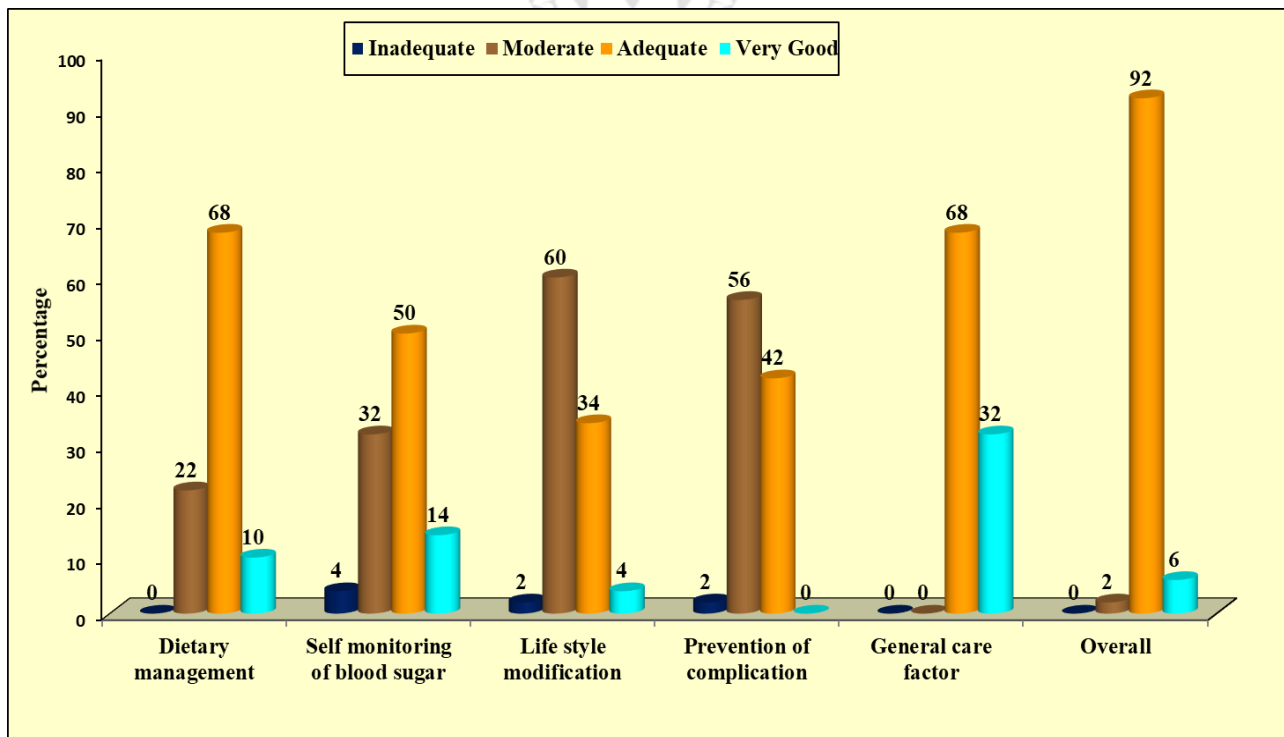**Figure No. 2: Percentage Distribution of Post-test level of Knowledge about Self Care Management among Mothers with GDM in the Control group**

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Table No. 1: Comparison of Post-test level of Knowledge about Self Care Management among Mothers with GDM between the Experimental and Control group. N = 100(50+50)

Knowledge Domains	Experimental Group		Control Group		Mean Difference Score & %	Unpaired 't' Test value
	Mean	S.D	Mean	S.D		
Dietary management	32.02	3.53	24.22	4.23	7.80	t = 9.997 p = 0.0001, S***
Self monitoring of blood sugar	24.58	4.28	18.40	5.15	6.18	t = 6.527 p = 0.0001, S***
Life style modification	14.84	2.66	10.14	2.71	4.70	t = 8.751 p = 0.0001, S***
Prevention of complication	8.98	1.77	6.26	1.55	2.72	t = 8.184 p = 0.0001, S***
General care factor	27.36	2.36	23.46	2.20	3.90	t = 8.532 p = 0.0001, S***
Overall	**107.78**	**11.90**	**82.48**	**10.34**	**25.30**	t = 11.346 p = 0.0001, S***

***p<0.001, S – Significant

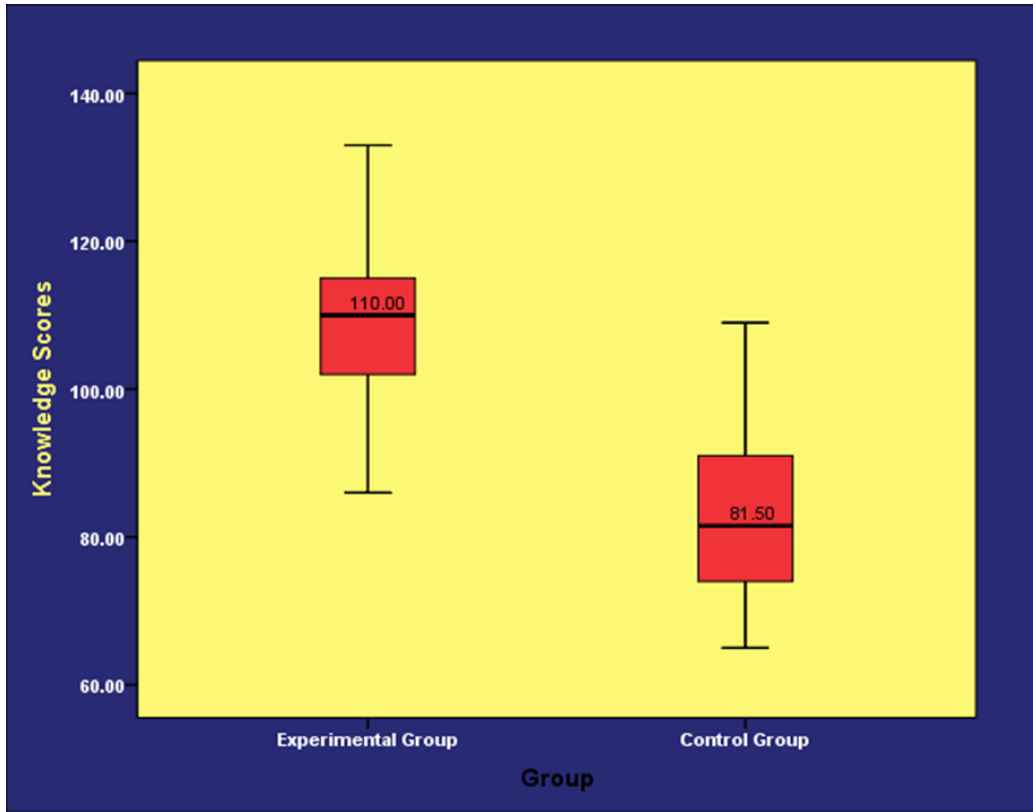*Citation: Arya. V et al. Ijsrm.Human, 2021; Vol. 17 (3): 10-19.*

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Figure No. 3: Boxplot showing the Comparison of Post-test level of Knowledge about Self Care Management among Mothers with GDM between the Experimental and Control group

This infers that there was a significant difference between the post-test level of knowledge among mothers with GDM in the experimental and control group which shows that Mobile App Intervention on self-care management administered to mothers with GDM in the experimental group had significant improvement in their post-test level of knowledge than the control group.

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Table No. 2: Comparison of Pre-test and Post-test level of Knowledge on Practice about Self Care Management among Mothers with GDM between the Experimental and Control group

N = 100(50+50)

Test	Group	Mean	S.D	Mean Difference Score & %	Unpaired 't' Test value
Pretest	Experimental Group	49.04	8.49	2.24	t = 1.272 p = 0.206 N.S
	Control Group	46.80	9.11		
Post Test	Experimental Group	66.96	7.16	**16.38**	**t = 11.554 p = 0.0001 S*****
	Control Group	50.58	7.01		

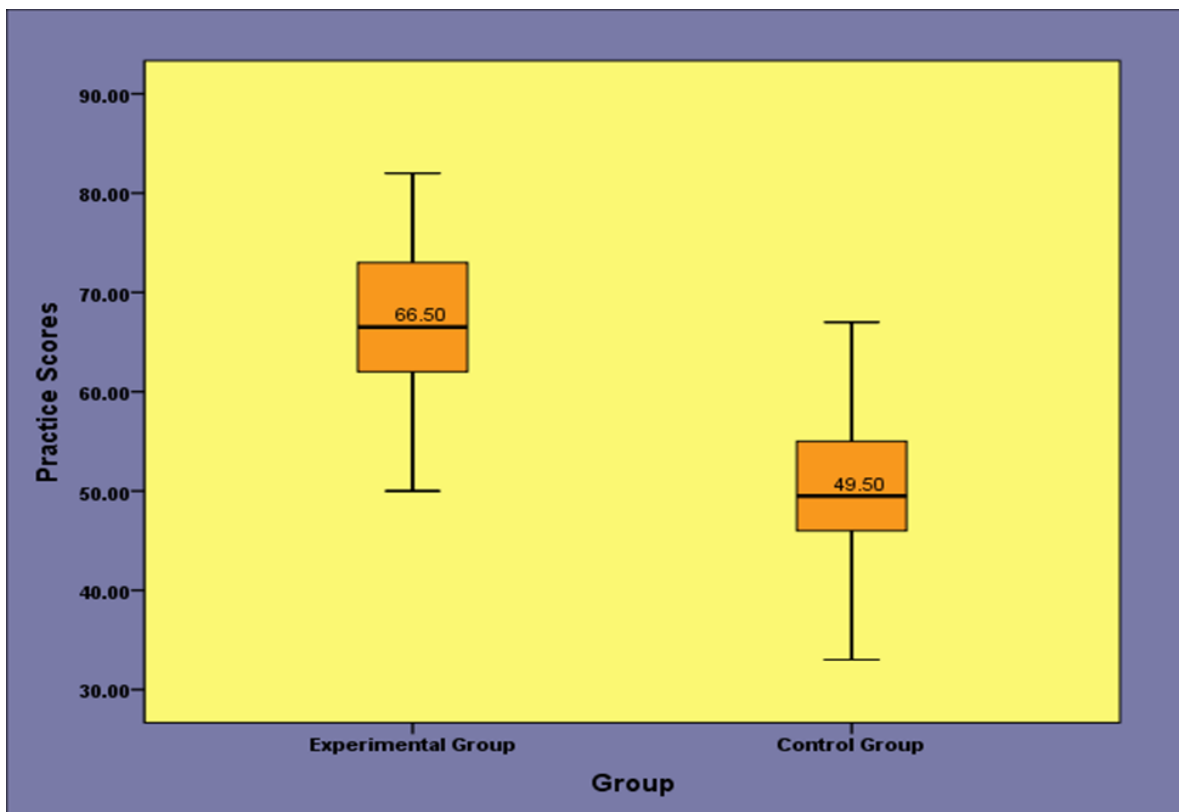***p<0.001, S – Significant, N.S – Not Significant

Figure No. 4: Boxplot showing the Comparison of Post-test level of Knowledge on Practice about Self Care Management among Mothers with GDM between the Experimental and Control group

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The calculated unpaired 't' test value of t = 11.554 was found to be statistically significant at p<0.001 level which clearly shows that Mobile App Intervention on self-care management administered to mothers with GDM in the experimental group had significant improvement in their post-test level of Knowledge on practice than the control group.

Bhowmik (2018), who revealed that 26.3% had good, 63.1% had an average, and 10.6% had poor knowledge on self-care management of gestational diabetic mellitus [9].

Guo *et.al***, (2019),** on the effects of a mobile health intervention on weight management, glycemic control, and pregnancy outcomes in patients with gestational diabetes mellitus. Result shows that the mHealth group demonstrated higher levels of complaints, lower frequency of outpatient service and lower hemoglobin AIC before delivery as well as the rates of off-target measurements both fasting and 2h post-prandial and weight gain less than the control group. The above findings are more or less similar to the present findings [10].

CONCLUSION

The study result proved that the effectiveness of Mobile Application intervention has improved the level of Knowledge and Practice regarding Self Care Management among mothers with GDM in the experimental group. So, this method of mobile application intervention on GDM self-care management can be promoted by nurses in their day to day activities in hospital settings.

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