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Research Article

Effectiveness of Mobile Diabetes Programme on Knowledge among Patients with Diabetes Mellitus

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Abstract: Background: Mobile and smartphone (mHealth) technologies have the potential to improve diabetes care and self-management. Studies conducted are evidence for the effectiveness of mHealth interventions for diabetes. **Objectives:** To evaluate the effectiveness of mobile diabetes programme on knowledge among patients with diabetes mellitus. **Methodology:** An evaluative study was conducted among 41 patients with diabetes mellitus at Bhucho Mandi community, Bathinda. The research design used for the study was Quasi Experimental pre-test post-test design without control group. Structured knowledge questionnaire were used to collect the data. **Results:** The study results revealed that majority of the respondents (46.34%) age lies between 30-40. 63.41% are males and 36.58% are females. None of the respondents had awareness about mobile diabetes. With respect to knowledge scores, majority of the subjects in pre-test 46.34% (19 patients) had inadequate knowledge, 53.65% (22 patients) had moderate knowledge. After the administration of mobile diabetes program, in the post-test about 4.87% (2 patients) had inadequate knowledge, 95.12% (39 patients) had moderate knowledge. **Conclusion:** The study concludes that mobile diabetes programme was effective in improving the knowledge regarding diabetes mellitus.
Keywords: Mobile Diabetes, Knowledge, Patients, Diabetes Mellitus.

Introduction

Diabetes is a chronic disease, which occurs when the pancreas does not produce enough insulin (type 1 diabetes), or when the body cannot effectively use the insulin it produces (type 2 diabetes). This leads to raised blood glucose (sugar) level and over time, serious damage to many of the body's systems, especially the nerves and blood vessels.[1] The World Health Organization (WHO) projects that diabetes will be the 7th leading cause of death by 2030. The NCD Country Profiles 2014 published by WHO reveals the large share of mortality is due to NCDs. In India, an estimated 7.8% of the population above 18 years of age has raised blood glucose level and are on treatment for diabetes.[2] Globally, there were 422 million adults with diabetes in 2014, compared to 108 million in 1980. Diabetes caused 1.5 million deaths in 2012. Higher-than-optimal blood glucose caused an additional 2.2 million deaths, by increasing the risks of cardiovascular and other diseases. Forty-three percent of deaths due to diabetes and higher than optimal blood glucose occur before the age of 70 years. The percentage of deaths attributable to high blood glucose or diabetes that occurs prior to age 70 is higher in low-and middle-income countries than in high-income countries.[3] Prevention of diabetes is possible through a mix of individual, population level, whole of government and whole of society level interventions. Many sectors of society have a role to play in preventing and treating diabetes, including governments, employers, educators, industry, civil society, private sector, media and individuals themselves.[4]

The number of patients with diabetes is rising globally, which impacts healthcare expenditures. Changing one's lifestyle by introducing self-management in the lives of the diabetes patients might stop this rise of diabetes. mHealth could support the self-management of the diabetes patients.[5]

mHealth is an integration of mobile technology's advantages in healthcare system. Mobile technology promotes healthcare services in the aspect of accessibility, effectiveness, and affordability. Recently, there is growing enthusiasm to capitalize on the research of mHealth to increase the nursing intervention on individual, communal, and global scales.[6]

Mobile health care which is the use of mobile technology in health care and public health has been continuously developed in recent decades.[7] mHealth interventions offer T2DM patients a way to overcome the shortcoming of traditional health tracking methods by providing convenience and medical care in daily life and minimizing the distance, time, and cost. However, more evidence is still needed regarding the effectiveness of these apps. Thus far, results among different studies have been inconsistent.[8]

Previous reviews of the mHealth tools have focused largely on text messaging, phone calls, or computer-based or laptop/tablet-based interventions rather than focusing on smartphone apps. Some recent studies have shown that among the diverse computer-based technologies, mobile phone interventions for diabetes self-management have been able to significantly reduce HbA1c levels.[9]

A study reported that traditional intervention methods could not provide adequate blood glucose control, while a mobile diabetes intervention method improved clinical outcomes. The fact that the Food and Drug Administration (FDA) has provided clearance and approval for the use of some diabetes management apps as medical devices since 2010, which implies that mobile health care is considered effective in the management of diabetes.[7]

Studies conducted are evidence for the effectiveness of mHealth interventions for diabetes. mHealth technologies that interacted with both patients and providers were more likely to be effective. More research with valid study designs and longer follow-up is needed to evaluate the impact of mHealth technologies for diabetes care and self-management.[10]

Considering such incredible potential of mHealth apps, it is critical to understand whether a user poses necessary literacy skills to use mHealth apps. To the best of our knowledge, this thread of research is still unexplored. Further study is needed on improving patient's participation to increase the effect of management via a mobile app. Mobile Diabetes will contribute to improve awareness about diabetes and promoting healthy diets and active lifestyle, which are vital to the prevention of diabetes.

Material and Methods

Research approach	**:**	Evaluative Research Approach.
Research design	**:**	Quasi Experimental pre-test post-test design without control group
Research setting	**:**	Bhucho Mandi, Bathinda.

Population

Target Population	**:**	Diabetes mellitus patients.
Accessible Population	**:**	Diabetes mellitus patients, Bhucho Mandi, Bathinda

Sample and sampling technique

Sample	**:**	Diabetes mellitus patients, Bhucho Mandi, Bathinda
Sampling technique	**:**	Purposive sampling technique
Sample size	**:**	40

Criteria for selection of the sample

Inclusion criteria

The study includes the Patients with diabetes (both men & women), who are:

- ✓ Diagnosed with type 2 diabetes mellitus.
- ✓ Willing to provide written consent to participate in the study.
- ✓ Having mobile phone and are able to operate basic mobile functions.

Exclusion criteria

The study excludes the Patients with diabetes, who are**:**

- ✓ Having Type 1 Diabetes, Gestational.
- ✓ Not interested to participate in the study.

Selection and development of the tool

A structured knowledge questionnaire was developed by the investigator in order to obtain answers from the patients. The tool used for research study was structured knowledge questionnaire which was prepared to assess the knowledge regarding diabetes mellitus.

Description of the data collection tool

In this study the data collection tools were consisted of 2 parts covering the following areas.

Part I: Demographic data of patients

Part II: Structured closed ended questionnaire to assess knowledge regarding self-care of diabetes mellitus.

Results

Findings related to socio-demographic variables of patients with diabetes mellitus

Majority of respondents age i.e. 46.34% respondents age lies between 30-40, 29.26% respondents age lies between 41-50 and 9.75% respondents age is above 61. 63.41% are male and 36.58% are females. 78.04% have nuclear family, 21.95% have joint family and 0% has extended family. 7.31% are professionals and, 21.95% are skilled workers, 21.95% are semi-skilled workers, 19.51% are unskilled workers and 14.63 are unemployed. Nobody among respondents are having any awareness about mdiabetes.

Findings related to effectiveness of Mobile Diabetes on knowledge of patients with diabetes mellitus regarding management of diabetes mellitus.

Table 1. C**omparison of pre-test and post-test level of knowledge regarding management of diabetes mellitus among diabetes patients.**

S/N	Level of Knowledge	Pre Test		Post Test	
		Frequency	Percentage	Frequency	Percentage
1	Inadequate Knowledge	19	46.34	2	4.87
2	Moderately adequate knowledge	22	53.65	39	95.12
3	Adequate Knowledge	0	0	0	0

The pretest scores show that, about 46.34% (19 patients) had inadequate knowledge, 53.65% (22 patients) had moderate knowledge, and no one had adequate knowledge before administering mobile diabetes program. The posttest scores show that, about 4.87% (2 patients) had inadequate knowledge, 95.12% (39 patients) had moderate knowledge, and no one had adequate knowledge after administering mobile diabetes program. It has been found that percentage of respondents who had inadequate knowledge of pre test scores was reduced after mobile diabetes programme and percentage of respondents who had moderately adequate knowledge of pre test scores was increased

after mobile diabetes programme. Hence mobile diabetes programme found effective in improving knowledge regarding management of diabetes.

Discussion

Similar study conducted by Maryam Peimani et al. found mobile intervention is a effective method of education in conjunction with conventional diabetes treatment. Mobile intervention can improve glycemic control and positively influence other aspects of diabetes.[11]

Conclusion

On the basis of the findings, the investigator concluded that the mobile diabetes programme which was prepared was effective. Hence, the diabetes mellitus patients should be encouraged to utilize mobile diabetes programs which will be more receptive to improve their level of knowledge regarding diabetes mellitus. The result of the study proved that mobile diabetes Programme to diabetes patients had an effect in improving their knowledge and practice.

Implications of the Study

The findings of the study have implications for Nursing Education, Practice, Research and administration. Hospitals, Nursing schools, colleges and teachers should come forward and encourage the students and staff nurses to provide information on mobile diabetes to community people with the help of audio visual aids.

Conflicts of interest: There is no conflict of interest of any kind.

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