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Research Article

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

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Abstract: Background of the study: 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 on practices among diabetes mellitus patients. **Objectives:** To evaluate the effectiveness of mobile diabetes on practice among patients with diabetes mellitus regarding management of diabetes. **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 rating scale was used to assess self-reported practices regarding management of diabetes mellitus. **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 practice scores, in pre-test majority of the subjects 90.24% (37 patients) had reported good practice and 9.75% (4 patients) had reported very good practice regarding self-care of diabetes. After administering mobile diabetes program, the post-test scores show that, about 100% (41 patients) had reported good practice regarding management of diabetes. **Conclusion:** The study concludes that mobile diabetes programme was effective in improving practice regarding management of diabetes.

Keywords: Mobile Diabetes, Practice, Patients, Diabetes Mellitus.

Introduction

Diabetes mellitus is one of the most common chronic diseases affecting humans and is rapidly expanding in prevalence worldwide. To a great extent, unhealthy lifestyle contributes to T2DM and one of the mainstays of treatment and prevention of diabetes is adopting a healthy lifestyle.[1]

About 422 million people worldwide have diabetes. India has over 60 million diabetics out of a population of 1.3 billion. In 2015, over 0.9 million deaths in India were attributed to diabetes directly or indirectly. The number of diabetics in the country is expected to increase to a staggering 109 million cases by 2035 out of an estimated population of 1.5 billion.[2]

Given the challenges in early detection, improving management and quality of life in confirmed diabetics, it is imperative to seek innovative ways that help to expand the reach of health literacy and services among the general population.

One of the most promising new opportunities is afforded by the high penetration of mobile communications in India: the country now has over a billion mobile subscriptions. The delivery of

healthcare services through mobile phones has increased worldwide over the past two decades and the global mobile phone revolution has inspired thousands of global health innovation projects.[2]

Recently, healthcare professionals and researchers have introduced more and more technological solutions into the healthcare system, particularly mobile Health (or mHealth). mHealth possesses the feasibility to support data collection and transferring at any time, thereby promoting more rapid convergence to optimal treatment. mHealth offers accessible health services to patients, reducing geographic and temporal barriers between patients and the healthcare professionals.[3]

Recently, mobile health has been applied to manage various acute and chronic diseases, such as diabetes, obesity, mental health, and smoking secession, with diabetes being the most common disease among them.[3] Nowadays, smartphone users are increasing rapidly employing diverse apps to help with T2DM self-management. The function of these apps aims mainly at monitoring clinical values, such as HbA1c, blood glucose, blood pressure, serum lipids, and body weight uploaded by users.[1]

A systematic review of the usability and effectiveness of diabetes apps was conducted. Searches were performed using MEDLINE, EMBASE, COMPENDEX, and IEEE XPLORE for articles published from January 1, 2011, to January 17, 2017. The search yielded 723 abstracts of which seven usability studies and ten clinical effectiveness studies met the inclusion criteria from 20 publications. Despite major satisfaction ratings and major usability problems, there is some limited evidence supporting the effectiveness of diabetes apps to improve glycemic control for adults with type 2 diabetes.[4]

Self-management is very important for patients with diabetes, and health care provided via mobile applications (apps) has a great advantage when applied to patients with diabetes; the adherence to activities for the management of diabetes, such as regular medication and insulin injection, self-monitoring of blood glucose (SMBG), diet, and exercise, can be improved through mobile apps.[5]

Mobile and smartphone (mHealth) technologies have the potential to improve diabetes care and self-management. But there was little evidence about persistent use by patients, use by a patient's health care provider. 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.[6]

Investigator believes Mobile and Smartphone (mHealth) technologies have the potential to improve diabetes care and self-management. Mobile Diabetes will also enhance health care seeking and early diagnosis; contribute to better adherence to drug or dietary control, self-care, as well as prevention of complications among patients with 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 and 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 practice rating scale was developed by the investigator in order to obtain answers from the patients. The tool used for research study was structured practice rating scale which was prepared to assess the self-reported practices regarding management of 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: Rating scale to assess self-reported practice 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 mobile diabetes.

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

Table 1. Comparison of pre-test and post-test level of practice regarding management of diabetes mellitus among diabetes patients.

S/N	Level of Practice	Pre Test		Post Test	
		Frequency	Percentage	Frequency	Percentage
1	Poor Practice	0	0	0	0
2	Average Practice	0	0	0	0
3	Good Practice	37	90.24	41	100
4	Very Good Practice	04	9.75	0	0

The above table shows distribution of mean pre-test and post-test practice Scores of diabetes patients regarding management of diabetes mellitus. The pre-test scores show that, about 90.24% (37 patients) had good practice and 9.75% (4 patients) had very good practice regarding management of diabetes before administering mobile diabetes program. The post-test scores show that, about 100% (41 patients) had demonstrated good practice regarding management of diabetes. It has been found that percentage of respondents who had good practice of pre test scores was improved after mobile diabetes programme. Hence mobile diabetes programme found effective in improving knowledge regarding management of diabetes.

Discussion

Similar study conducted by Pfammatter et al.[7] found that Participants receiving texts messages demonstrated greater improvement in a health behaviour. Improved fruit, vegetable, and fat consumption (P<.01). The study concluded that, Mobile Diabetes reached consumers from all over India, and impacted people in both urban and rural areas.

Conclusion

On the basis of the findings, the investigator concluded that the mobile diabetes programme was effective, feasible and showed initial evidence of effectiveness in improving diabetes-related health practices. Hence, the diabetes mellitus patients should be encouraged to utilize mobile diabetes programs which will be more receptive to improve their practice level.

Implications of the Study

The findings of the study have implications for Nursing, Practice, Research and administration. Community health nurses can conduct teaching session with demonstration for community people to improve their practices regarding management of diabetes mellitus.

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

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