

A study to assess the level of knowledge, practices and attitude regarding blood glucose self monitoring among diabetic patients at selected communities of Ambala, Haryana

Running Title:

“Knowledge, practices and attitude regarding blood glucose self monitoring among diabetic patients”

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ABSTRACT: Diabetes, refers as diabetes mellitus, demonstrates a social event of metabolic issues in which the individual has high blood (glucose), either insulin age is insufficient, or the body’s cells don’t respond properly to insulin, or both (WHO 2020). There are three standard kind of diabetes these are Type 1, Type 2, gestational diabetes.

Aims and objectives: The aim of the study was to assess the level of knowledge, practices and attitude regarding blood glucose self-monitoring among diabetic patient of Haryana. **Methodology:** The research approach adopted for the study was non experimental approach. The research design adopted for the study was descriptive survey research design. Try out and pilot study was conducted at MMIMS&R Hospital Mullana, Ambala Haryana, and final study was conducted in Adhoya, Mullana, Barara, Bhudiun and Rajokheri village. Sample of the study was 157 diabetic patients, selected by purposive sampling technique.

Result: Maximum no. of patients were having below average level of knowledge, average level of practices and moderately favourable attitude towards blood glucose self-monitoring.

Conclusion: There was strong positive correlation between practices with knowledge and attitude. But there was weak positive correlation between attitude and knowledge. There is no significant association of level of knowledge of diabetic patients with all the demographic variables except Age, Gender, Residing area. There is not significant association of level of practices of diabetic their demographic variables.

Keywords: Diabetic patients, blood glucose self-monitoring, Knowledge, Practices, attitude

Introduction

The prevailing burden of communicable and infectious diseases is already heaping enormous pressure on the health care system of developing countries. These, coupled with the increase in the prevalence of non-communicable diseases such as diabetes mellitus is projected to become one of the world’s main disorder and killer within the next twenty-five years.

The prevalence of diabetes is rapidly rising all over the globe at an alarming rate. Over the past 30 year, the status of diabetes has changed from being considered as a mild disorder of the elderly to one of the major causes of morbidity and mortality affecting the youth and middle-aged people. It is important to note that the rise in prevalence is seen in all six inhabited continents of the globe. Although there is an increase in the prevalence of type 1 diabetes also, the major driver of the epidemic is the 217 more common form of diabetes, namely type 2 diabetes, which accounts for more than 90 per cent of all diabetes cases.¹

Self-monitoring of blood glucose (SMBG) is an important component of modern therapy for diabetes mellitus. SMBG has been recommended for people with diabetes and their health care professionals in order to achieve a specific level of glycemic control and to prevent hypoglycemia. The goal of SMBG is to collect detailed information about blood glucose levels at many time points to enable maintenance of a more constant glucose level by more precise regimens. It can be used to aid in the adjustment of a therapeutic regimen in response to blood glucose values and to help individuals adjust their dietary intake, physical activity, and insulin doses to improve glycemic control on a day-to-day basis.²

Self-monitoring of blood glucose (SMBG) can be a useful tool in the management of diabetes mellitus. Patients with diabetes often measure their blood glucose to detect hypoglycemia and to adjust insulin dose as needed. Others utilize SMBG to help establish a profile of blood glucose levels and response to nutrition and pharmacotherapy. The American Diabetes Association (ADA) initially established guidelines for SMBG in 1987, and current recommendations suggest regular SMBG in persons with diabetes based on each patient's needs.³

Self-monitoring of blood glucose by persons with diabetes is an integral part of intensive glycemic treatment and is widely believed to improve the control of blood glucose levels and health outcomes. The results of the Diabetes Control and Complications Trial (DCCT) among persons with type 1 diabetes mellitus showed that intensive glycemic control significantly slowed the progression of diabetes complications.⁴

The DCCT protocol required SMBG at least four times each day and multiple injections of insulin. Furthermore, the United Kingdom Prospective Diabetes Study found that a reduction in A1C was associated with a decreased risk of microvascular complications in persons with T2DM.⁵

A study conducted by Xiaoyan Lv; Doris S. F. Yu; Yingjuan Cao and Jinghua Xia in 2021 shows that the participants were poorly adept with monitoring their blood glucose and lacked the ability to deal with abnormal blood glucose levels most participants had a good relationship with medication and physical activity. Living without children was perceived as a benefit that improved dietary management and is a disadvantage in terms of economic and emotional support and access to medical resources. Elderly empty-nesters also lacked knowledge about diabetes and paid little attention to potential complications.⁶

Dr. V. Krishnan (Assistant Professor) in 2015 conducted a study which shows that Out of 153 patients, 37 (24.1%) (20 males, 17 females) patients possessed adequate knowledge on self-blood glucose monitoring whereas 116 (64 males, 52 females) (75.8%) patients did not aware and not following steps of self-monitoring properly. Seventy-two patients learnt self monitoring by physician and ninety-eight (64.05%) admitted themselves either they skip or taking more units on insulin without consulting their physician. A total of 132 (86.2%) patients expressed that they could recognize symptoms of hypoglycemia. Only 43 (28.1%) patients regularly record their blood sugar values found by self-monitoring. Self-monitoring of blood glucose should be encouraged and patients should be taught importance of following correct steps and tracking of self-monitoring by physician or diabetes educator.⁷

From the above discussion, it is clear that a diabetes epidemic has emerged during the latter part of the 20th century and continues unchecked in the 21st century. While working in clinical areas we come across various patients and find that the patients with diabetes mellitus possess very little knowledge regarding blood glucose self monitoring. So, it became a need to assess their knowledge regarding blood glucose self-monitoring.

Aim

The aim of study was to assess the study to assess the level of knowledge, practices and attitude regarding blood glucose self-monitoring among diabetic patients at selected communities of Haryana.

Material & Methods

The present study is conducted in 2022 and it is a non experimental (descriptive survey design). The population of the study included diabetic patients who were from communities of Ambala, Haryana. The sample of 157 diabetic patients was selected using the purposive sampling method. All participants signed informed consent.. Inclusion criteria were diabetic patient's willingness and availability to participate in the study. And those who were not available at the time of data collection were excluded.

Ethical consideration

Ethical approval was obtained from the ethical committee of M.M.I.M.S.R & Hospital Mullana, Ambala to conduct the final study. The study was carried out in accordance with the guidelines laid by Indian Council of Medical Research. Research participants were enrolled in the study after written informed consent and they were assured about the confidentiality of their response.

Data Collection

For data collection tools were developed and were divided in 4 parts. The first part included questions about selected variables of diabetic patients, including age, gender, marital status, place of residence, level of education, type of occupation, family history of diabetes, duration of therapy for diabetes, type of treatment taken by patient, source of knowledge. The second part was structured knowledge questionnaire containing 30 questions to investigate diabetic patient's knowledge regarding blood glucose self monitoring. The third part was Practice checklist consisted of 15 items. The fourth part was attitude scale consisted of 13 items.

After getting the formal administrative approval, the final study was conducted in the month of April – May 2022 at selected rural areas of Ambala, Haryana.

A total of 157 samples were selected by using purposive sampling technique and interview method was used to collect the data. The data was collected using structured knowledge questionnaire, practices checklist and attitude scale. Written consent was taken from the subjects. Prior information was given to the subjects about the purpose of the study.

Content validity of tool was established by seven experts for its accuracy and relevancy and also to obtain their opinion and suggestions. Furthermore, the reliability of the structured knowledge questionnaire was determined with KUDER RICHARDSON-20 and found to be 0.76. And Practice checklist and attitude scale was determined with cronbach alpha and found to be 0.7.

Data Analysis

To analyze data, descriptive tests, including frequency, percentage, mean, and standard deviation (SD), t test and One way ANOVA

Results

A total of 169 nurses were included in the study maximum of patients was in the age group between 45- 60 (43.4%) and minimum patients were in the age group of <45 (17.1%) and >75 (6.4%). Majority of the patients were females (56.1). Most of the patients were married (90.6%) and were from rural area (76.5%). Maximum no. of patients was having educational status of senior secondary (78.9%). Majority of the patients were shopkeeper, farmer, businessman, house wife etc. as their occupation. Maximum of patients (68.7%) of patients were not having any family history of diabetes mellitus. Half of the patients were taking from last 3-7 years. Majority of patients (92.4%) were taking oral tablets as treatment. Health personnel were the source of knowledge for (92.4%) patients.

(31.2%) were having below average level of knowledge and (29.9%) were having good and average level of knowledge. Only (8.9%) of patients were having very good level of knowledge regarding blood glucose self-monitoring. Most of the residents (43.3%) were having the average level of practices towards blood glucose self-monitoring. Only (29.9%) diabetic patients were having good level of practices. (26.8%) diabetic patients were having poor level of practices. The diabetic patients were having moderately favorable attitude (68.8%) towards blood glucose self-monitoring. (29.95) were having highly favorable attitude and only (1.3%) were having unfavorable attitude.

The mean is 16.0, 19.04, 46.8, median is 16.0, 9.0, 47.0 and standard deviation is 3.90, 2.30, 6.46 for level of knowledge, practices and attitude among diabetic patients regarding blood glucose self-monitoring. There was strong positive correlation between practices and knowledge and between practices and attitude regarding blood glucose self-monitoring among diabetic patients. But there was weak positive correlation between attitude and knowledge. There is no significant association of level of knowledge with their demographic variables except age, gender and residing area among diabetic patients. There is no significant association of

level of practices with age, gender, marital status, residing area, educational status, occupation, family history, duration of therapy, type of treatment and source of knowledge. There is no significant association of level of attitude with their demographic variable except age.

Discussion

In the present study maximum of the diabetic patients were females (56.1%) and majority were from age group of 45-70 years (43.4%). These findings are similar to the findings of the study conducted by **H. M. M Herath1, N. P. Weerasinghe2 (2017)** which also indicates that maximum of the participants were females (58.5%) and majority were from the age group of 40-65 years (56.3%).⁸

In the present study majority of the diabetic patients were having senior secondary as their qualification (78.9%) and majority of them are residing in rural area (76.5%). These findings are similar to the study conducted by **Srushti C. Ghadge, Manisha C. Gholap1, Dr. Vaishali (2019)** which indicates that majority of participants were having senior secondary as their qualification (40%) and majority of them were residing in rural area (71%).⁹

In the present study majority of the participants were having 3-7 years as the duration of treatment (43.3%). Similar study was conducted by **Srushti C. Ghadge, Manisha C. Gholap1, Dr. Vaishali (2019)** which shows that 30% of the population were having less than 1 year as the duration of treatment.⁹

In the present study most of diabetic patients (92.4%) were taking oral tablet as their treatment. These findings are similar to the findings of the study conducted by **C N Unachukwu, E E Young, and D I Uchenna (2011)** which shows that (58%) of the diabetic patients were taking oral tablets.¹⁰

In the present study maximum of the participants (31.2%) were having below average level of knowledge and minimum of the participants (29.9%) were having good knowledge. Most of the diabetic patients (43.3%) were having the average level of practices and only (29.9%) were having good level of practices regarding blood glucose self-monitoring. Maximum diabetic patients (68.8%) were having moderately favourable attitude and only (1.3%) were having unfavourable attitude towards blood glucose self-monitoring. These findings are contradictory to the study conducted by **Srushti C. Ghadge, Manisha C. Gholap1, Dr. Vaishali (2019)** shows that the level of knowledge were good in (21%), average in (70%) and poor in (9%) of diabetic patients.⁹

The levels of attitude were also described accordingly as positive for (66%) and negative for 34(34%) of diabetic patients. The level of practice of study were found to be good in (24%), average in (48%) and poor practice in (28%) of diabetic patients. In this study we found average knowledge, positive attitude and average level of practice towards blood glucose monitoring among diabetic patients.⁹

In the present study there was strong positive correlation between practices and knowledge and between practices and attitude regarding blood glucose self-monitoring among diabetic patients. But there was weak positive correlation between attitude and knowledge. These findings are similar to the study conducted by **Shima Ghannadi, Atieh Amouzegar, Parisa Amiri, Rona kkarbalaeifar, Zhale Tahmasebinejads, and Sara kazemour-Ardeili (2016)** which shows that there was significant correlation between patients' knowledge and practice with their self-care activities.¹¹

In the present study there is association of level of knowledge with age, gender and residing area among diabetic patient among self-glucose monitoring. These findings are contradictory to the findings of the study conducted by **H.M.M Herath, N.P.Weerasinghe, H. Dias and T.P. Weeraratna (2017)** which shows that association of age and gender with knowledge was not significant.¹²

Conclusion

Diabetic patients have below average level of knowledge, average level of practices and moderately favorable attitude regarding blood glucose self monitoring.

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Conflicts of interest There are no conflicts of interest.

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Table 1 Frequency and percentage distribution of level of knowledge among diabetic patients

N=157

S.NO	LEVEL OF KNOWLEDGE	SCORES	f	%
1.	Very Good	> 23	14	8.9
2.	Good	18-22	47	29.9
3.	Average	15-18	47	29.9
4.	Poor	<15	49	31.2

Min: 0

Max: 30

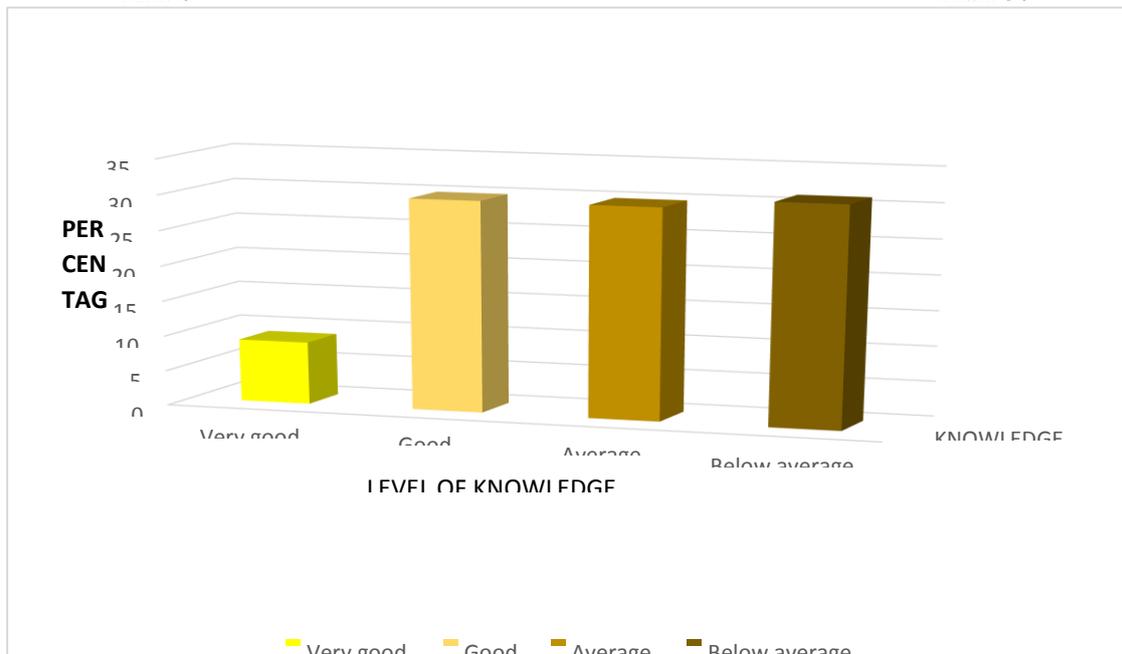


Figure 1- A bar graph representing level of knowledge among diabetic patients

Table 2. Frequency and percentage distribution of level of practices among diabetic patients

N=157

S. NO	LEVEL OF PRACTICES	SCORE	f	%
1.	GOOD	>11	47	29.9
2.	AVERAGE	8-10	68	43.3
3.	POOR	<8	42	26.8

Min: 0

Max: 15

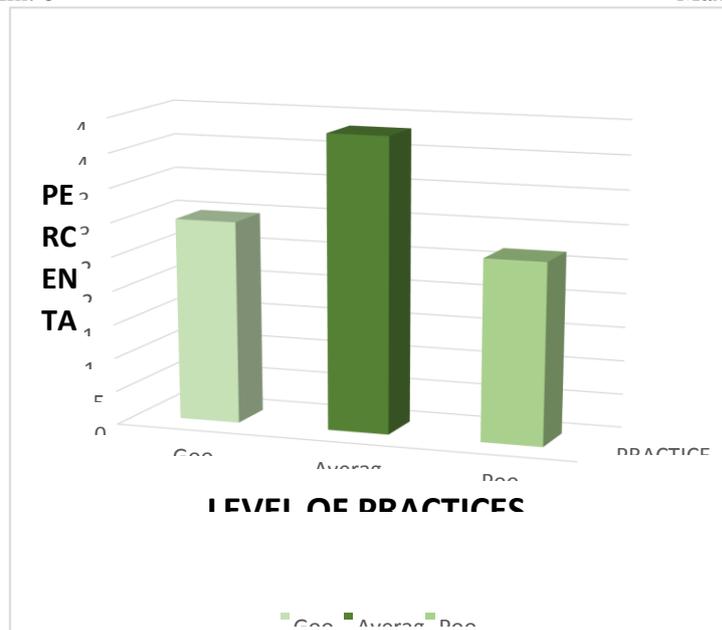


Figure 2- A Bar graph representing frequency and percentage distribution of level of practices among diabetic patients

Table 3 Frequency and percentage distribution of level of attitude among diabetic patients

N=157

Sr. No.	Level of Attitude	Score	f	%
1.	Highly favorable	>49	47	29.9
2.	Moderately favorable	33-49	108	68.8
3.	Unfavorable	<33	2	1.3

Min.: 13

Max.: 65

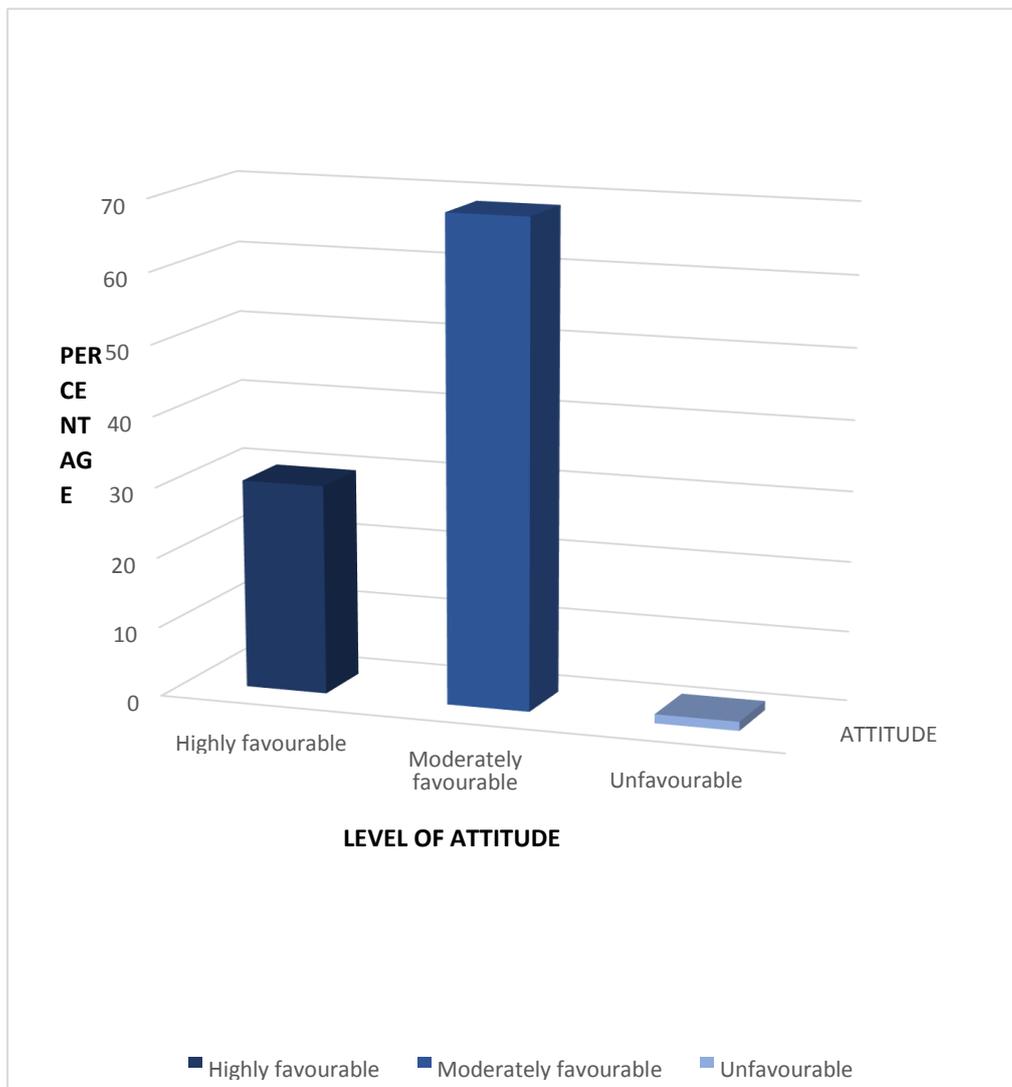


Figure 3- A Bar graph representing frequency and percentage distribution of level of attitude among diabetic patients

Table 4 Range, Mean, Median and standard deviation of level of knowledge among diabetic patients.

N=157

S.NO	Variable	Range	Mean± SD	Median
1.	KNOWLEDGE	7-26	16.0±3.90	16.0

Min.: 0 Max.: 30
 5 Range, Mean, Median and standard deviation of level of practices among diabetic patients

N=157

S.NO	Variable	Range	Mean ±SD	Median
1.	PRACTICES	3-15	9.04±2.30	9.0

Min.: 0 Max.: 15
 Table 6 Range, Mean, Median and standard deviation of level of attitude among diabetic patients

N=157

S.NO	Variable	Range	Mean± SD	Median
1.	ATTITUDE	20-61	46.8±6.46	47.0

Min.: 13

Max.: 65

Table 7 Pearson correlation of knowledge, practices and attitude among diabetic patients

N=157

Correlation	Knowledge (r and p value)	Attitude (r and p value)	Practice (r and p value)
Knowledge	XX	0.05(0.47)	0.21(0.06)
Attitude	0.07(0.47)	XX	0.46(0.00)
Practices	0.21(0.06)	0.46(0.00)	XX

Not significant ($p > 0.05$)significant ($p \leq 0.05$) *