Scholars Academic Journal of Pharmacy
Abbreviated Key Title: Sch Acad J Pharm
ISSN 2347-9531 (Print) | ISSN 2320-4206 (Online)
Journal homepage: http://saspublishers.com

OPEN ACCESS

Pharmacy Practice

Evaluation of Self-Care Practice and Impact of Patient Counselling in Type- 2 Diabetic Patients

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DOI: 10.36347/sajp.2022.v11i06.002 | **Received:** 09.05.2022 | **Accepted:** 17.06.2022 | **Published:** 21.06.2022

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Abstract **Original Research Article**

The study was conducted to assess the self-care practices in type 2 diabetes mellitus patients and the effectiveness of patient counselling in improving those practices in a tertiary care hospital setting. The study was a prospective interventional study that was carried out in the outpatient department of general medicine and conducted for 6 months. Self-care practice was evaluated with the help of the Knowledge, Attitude, and Practice Questionnaire, Morisky Medication Adherence Scale 8, and Diabetic Treatment Satisfaction Questionnaire. During the study period, 150 patients were screened and 132 patients who met the inclusion criteria were enrolled in the study. Out of this, 53% were male patients and 47% were female patients. The highest prevalence of the disease was found to be 34.85% in the age group 61-70. From the Knowledge Attitude Practice Questionnaire, it was observed that the good, average, and the poor scores were 9.8%, 42.4%, and 47.7% for knowledge, 3.0%, 65.1% and 31.8% for attitude, and 23.4%, 65.9% and 10.6% for practice respectively. There was an overall improvement in the knowledge, attitude, and practice of the patients. The medication adherence and Diabetic Treatment Satisfaction Questionnaire scores also showed notable improvement. The results were analyzed by comparing the baseline and follow-up scores. Diabetes self-management is critical to having a favourable clinical result. The intervention of educational programs by the health care team is very essential for a better understanding and management of the disease for the patients in achieving their healthcare goals.

Keywords: Diabetes Mellitus, self-care, Knowledge Attitude Practice questionnaire, patient counseling.

INTRODUCTION

Diabetes is a chronic metabolic condition marked by high blood glucose levels, which can potentially cause damage to the heart, blood vessels, eyes, kidneys, and nerves over time. Type 2 diabetes mellitus is a form of diabetes is characterized by insulin resistance and at least initially, a relative lack of insulin secretion. The majority of people with type 2 diabetes have abdominal obesity, which leads to insulin resistance. In addition, hypertension, dyslipidemia (high triglyceride levels and low HDL-cholesterol levels), and elevated inhibitor plasminogen activator-1 (PAI-1) levels are often present in these individuals [1]. The long-term effects of diabetes lead to neuropathy, nephropathy, retinopathy, etc [2].

One of the most important purposes of therapy today is to educate and assist patients in managing chronic illnesses like diabetes. Diabetic patients require education in nutrition, physical exercise, self-monitoring of blood and urine, and/or medication administration. Increased public awareness about diabetes and its complications, as well as related metabolic disorders, is a critical component of preventing diabetes and its complications. The most essential markers of awareness are knowledge and attitude, which must be researched in various demographic groups and ethnic and cultural contexts. Knowledge is essential for the early detection and prevention of diseases. Diabetic patients need to have positive knowledge, attitude, and practice (KAP) [3, 4].

The Morisky Medication Adherence Scale (MMAS-8) is a widely used, verified self-administered measure for assessing medication adherence. Medication adherence is one of the most important

factors in determining therapeutic outcomes, particularly in patients with chronic illnesses. Low drug adherence has gained popularity since it greatly reduces the benefits of current medical care also while imposing a considerable financial burden on both individual patients and the healthcare system as a whole [5, 6].

The DTSQ (Diabetes Treatment Satisfaction Questionnaire) was developed to assess how satisfied patients are with their diabetes treatment. The DTSQ can be used to compare different medicines or treatment regimens, as well as to assess the quality of diabetes care in clinical settings. Improved treatment satisfaction may promote patients' self-efficacy and medication adherence, leading to long-term stable glucose control and a lower risk of diabetic complications [7].

Diabetes is fast gaining the status of a potential epidemic in India with more diabetic individuals. Our country currently faces an uncertain future concerning the potential burden that diabetes may impose. Lack of knowledge, negligence and poor adherence to medications are key factors for poor disease management. We intend to show that with proper patient education, and follow-up, we can improve the patient's disease condition and improve their quality of life.

MATERIALS AND METHODS

A Prospective, Interventional study was conducted at a tertiary care teaching, Kerala for 6 months. The study was approved by the Institutional ethics Committee. The study population included patients who are above 18 years of age diagnosed with Type 2 Diabetes mellitus who kept up with regular follow-up appointments and are on anti-diabetic medications. Patients who are not willing to give informed consent, patients with mental disorders, HIV patients, and gestational diabetic patients were excluded from the study.

A self-designed Knowledge, Attitude, Practice Questionnaire was prepared and given to patients to assess their self-care practice. The knowledge assessment score was categorized out of 10 into 8-10 as good knowledge, 5-7 as average knowledge, and <4 as poor knowledge. The attitude assessment score was categorized out of 18 into 12-18 as good, 2-11 as average, and <2 as poor. The practice assessment score was categorized out of 5 into 5 as good, 3-4 as average, and 0-2 as poor.

The Morisky Medication Adherence Scale (MMAS 8) was used to assess medication adherence. The scale composes of 8 items in which the response choices are "yes" or "no" for items 1-7 except 8 which have a five-point response scale. For each "no" response it is rated as 1 and each "yes" response is rated as 0 except for item 5 wherein the "no" response is weighed as 0 and the "yes" response is rated as 1. For item 8, if the response is "0", the score is 1 and if the response is "4", the score is 0. The responses "1, 2, 3" given a score of 0.25, 0.75 and 0.75 respectively. Total MMAS-8 score ranges from 0 to 8. They have been categorized into three levels of adherence: high adherence (score 8), medium adherence (score of 6 to 8), and low adherence (score less than 6).

The questionnaires were provided to the patients and their baseline scores were recorded. The patients were then given counselling with the help of Patient Information Leaflets (PILs). The first follow-up (after 1 month) and second follow-up (after 3 months) were conducted using the same questionnaires and the scores were recorded and compared with the baseline score.

The DTSQ (diabetes treatment satisfaction questionnaire) was used to assess the satisfaction with the treatment. The treatment satisfaction was assessed by categorizing it into three groups. Those who had a score from 27 -36 as satisfied, 20-26 moderately satisfied, and less than 19 poorly satisfied.

Data were entered into Microsoft Excel 2007 and further analyzed using statistical software SPSS version 21.0. The categorical variables were presented as frequency and percentage and the continuous variables were reported using mean and standard deviation. The quantitative variables were evaluated by paired t-tests. p-value <0.05 was considered statistically significant.

RESULT AND DISCUSSION

The prevalence of Type 2 Diabetes Mellitus is rising. This has been ascribed to rising obesity, sedentary lifestyles, and a growing minority population, among other factors. Lack of knowledge, negligence and poor adherence to medications are key factors for poor disease management. We aim to evaluate the self-care practice and impact of patient counseling on Type 2 Diabetes patients.

A total of 150 patients were enrolled in the study, however, after the first and second follow-ups, the patient population declined to 132.

Demographic Details

The highest occurrence of the disease was found to be in patients between the age group of 61-70 (34.85%) (Table 1). In the study conducted by Viral N. Shah *et al*., 2009 [8], the highest occurrence of Type 2 Diabetes Mellitus (40.33%) belonged to the age group between 50-59 years. Another study conducted by Behailu Hawulte Ayele *et al*., 2019 [9], showed that 59% of the study participants were 50+ years of age. From this, we observed that older people are more at risk of developing Type 2 Diabetes Mellitus.

Table 1: Age-wise distribution of patients diagnosed with type 2 Diabetes Mellitus (n=132)

Sl. No	Age Group (In Years)	Number of Patients	Percentage (%)
1	<40	1	0.76
2	41-50	16	12.12
3	51-60	37	28.03
4	61-70	46	34.85
5	71-80	24	18.18
6	80-90	8	6.06

Table 2 shows the gender-wise distribution. Our study indicates a higher prevalence of TYPE 2 DM in males than in the female population. The study conducted by Pyke DA *et al*., [10], showed that females were more prone to TYPE 2 DM. The higher prevalence of the disease progression in our study is associated the risk factors like obesity, hypertension, physical inactivity etc.

Table 2: Gender-wise distribution of patients diagnosed with type 2 Diabetes Mellitus (n=132)

Sl. No	Gender	Frequency(N)	Percentage (%)
1	Male	70	53
2	Female	62	47

Knowledge Attitude Practice Questionnaire

Table 3 shows a Comparison of Knowledge, Attitude, and Practice at Baseline and a second follow-up using paired t-test ($p<0.05$). Since the p-value is less than 0.05, it indicates there is a significant difference in patient knowledge, attitude, and practice from baseline to subsequent follow-ups.

Table 3: Comparison of Knowledge, Attitude, and Practice at Baseline, First Follow Up and Second Follow Up (n=132)

Sl. No	Parameter	Baseline (Mean ± S.D)	First Follow-up (Mean ± S.D)	Second Follow-up (Mean ± S.D)	Mean Difference	Significance (p-value)
1	Knowledge	4.93±2.090	6.61±1.684	7.61±1.512	2.682	0.001
2	Attitude	3.46±3.689	5.33±3.199	6.10±3.133	19.610	0.001
3	Practice	3.72±0.975	3.803±0.911	4.20±0.766	0.768	0.001

The number of patients having poor knowledge, attitude, and practice decreased from the baseline to later follow-ups while the patients with average and good knowledge, attitude and practice increased from the initial point (Table 4). Based on the study conducted in Iran by [4], the study participants show high general knowledge scores and had a good attitude and practice scores at the baseline in comparison with our study. But the study conducted by Upadhyay *et al*., 2012 [11], shows less knowledge, attitude, and practice similar to ours. The study done by Singh *et al*., 2013 [12], assessed patients in two groups: governmental and non-governmental hospitals in Nepal. Patients in non-governmental hospitals had good knowledge, while those in governmental hospitals had less knowledge than the patients in the present study. They did not assess the patients' attitudes and practice. In our study, an improvement in KAP score was observed after a successful patient counseLling program.

Table 4: Distribution of Knowledge, Attitude, and Practice Scores Among Study Participants at Baseline, First Follow-Up, and Second Follow-Up

Sl. No	Parameter	No. of participants showing Poor Score	No. of participants showing Average Score	No. of participants showing Good Score
A	**Knowledge**			
1	Baseline	63	56	13
2	First Follow Up	12	76	44
3	Second Follow Up	2	55	75
B	**Attitude**			
1	Baseline	42	86	4
2	First Follow Up	15	113	4
3	Second Follow Up	10	117	5
C	**Practice**			
1	Baseline	14	82	31
2	First Follow Up	10	88	34
3	Second Follow Up	2	78	52

MEDICATION ADHERENCE

The difference between the mean (1.01705) shows the difference between mean scores in the baseline and second follow-up i.e., 4.5852 and 5.6023 respectively. Since the p-value is <0.001, there is a significant difference in the baseline and after the 3-month follow-up.

Table 5: Comparison of Medication Adherence at Baseline, First Follow Up and Second Follow Up (n=132)

Sl. No	Parameter	Baseline (Mean ± S.D)	First Follow-up (Mean ± S.D)	Second Follow-up (Mean ± S.D)	Mean Difference	Significance (p-value)
1	Medication Adherence	4.58±1.709	5.10±1.361	5.60±1.359	1.017	0.001

The majority of the participants (80.3%) shows poor medication adherence to the anti-diabetic treatment. Similarly, in the study conducted by K. Yuvaraj *et al*., 2019 [13], found that almost one-third (32.7%) of the study participants were not properly adherent to the medications. However, findings similar to our study were reported in other South Indian studies carried out in Andhra and Karnataka where almost one-third of the participants were non-adherent to medications.

Table 6: Distribution of Adherence Scores Among Study Participants at Baseline, First Follow-Up, and Second Follow-Up

Sl. No		No. of participants showing Poor Score	No. of participants showing Average Score	No. of participants showing Good Score
1	**Baseline**	106	20	6
2	**First Follow-up**	86	39	7
3	**Second Follow-up**	68	49	15

TREATMENT SATISFACTION

Over the study period, the treatment satisfaction scale score shows a gradual increase from baseline to first and second follow-up, and the patient satisfaction score was found to be 8, 16, 26 as satisfied, 56, 66, 80 as moderately satisfied, and 68, 50, 26 as poorly satisfied respectively. The total number of patients showing hyperglycemia and hypoglycemia in the baseline was 116 and 98 which gradually decreased in the final follow-up to 86 and 80 respectively. This shows patient counselling has a significant effect on the treatment satisfaction and glycaemic control of the patients. In comparison with the study conducted by Shoko Tsukube *et al*., 2015 [14], the treatment satisfaction score improved in the final evaluation due to the low frequency of hypoglycemic occurrence.

DIABETIC TREATMENT SATISFACTION AND MEDICATION ADHERENCE AMONG THE STUDY PARTICIPANTS

Of the 132 diabetic patients studied, 101 were satisfied with the diabetic treatment received, whereas, 31 were not satisfied and 46 diabetic patients were adherent to antidiabetic medication, whereas, 86 of them were not adherent to the medication.

Table 7: Association between Patient Satisfaction and Patient Medication Adherence

		MEDICATION ADHERENCE		TOTAL
		Non-Adherent	Adherent	
PATIENT SATISFACTION	**Not Satisfied**	26	5	31
	Satisfied	60	41	101
TOTAL		86	46	132

Among 101 diabetic patients, 60 patients were satisfied with the treatment, 41 of them were adherent to the mediation, whereas, 60 were non-adherent with the medication. The difference was statistically significant (χ^2=6.25; p=0.012) which correlates with the study conducted by Iloh Gabriel Uche Pascal *et al*., 2016 [15], which shows 85.8% of the diabetic patients were satisfied with the treatment and it was significantly associated with medication adherence.

CONCLUSION

The study results revealed an overall improvement in the self-care practices in patients with type 2 diabetes mellitus after a successful patient counseling program. The knowledge, attitude, and practice were assessed using the KAP questionnaire, and a significant improvement in knowledge was noted in the study. Educating diabetic patients regarding their illness is vital because a successful Diabetes Mellitus treatment can be achieved only by focusing on lifestyle modifications along with drug therapy. The medication adherence to the anti-diabetic drugs also showed a notable improvement when the baseline and the follow-up scores were compared; the scores were assessed using the MMAS 8 questionnaire. The Diabetes Treatment Satisfaction Questionnaire (DTSQ) scores also revealed an improvement in the satisfaction with

the treatment after patient counselling. It was observed that the improvement in satisfaction was associated with medication adherence. Our study suggests that clinicians might have to consider giving emphasis on caring and giving follow-up services to Diabetes Mellitus patients and also counseling services which will be beneficial for successful treatment of the disease. Considering this, the patient information leaflets and other educational mediums should be provided for a better understanding and awareness of the disease. Hence health care teams need to provide proper educational programs for the patients, and the implementation of such a service to the community will help in disease management.

Conflict of Interest: The authors have no conflicts of interest regarding this investigation.

ACKNOWLEDGMENTS: We would like to thank PK Das Institute of Medical Sciences for allowing us to conduct our study.

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