

# Self-management practices among type 2 diabetes patients attending physicians and pharmacists: An exploratory study from Lahore, Pakistan

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## Abstract

**Background:** Globally, Pakistan is among the top 10 countries in terms of the proportion of the population living with diabetes. Type 2 diabetes cannot be cured permanently, but complications and premature deaths can be prevented by adopting healthy lifestyles. Self-management is the key to controlling diabetes. Besides rational therapeutic approaches, patient counseling by physicians and pharmacists is crucial because self-management practices are generally influenced by the patient's knowledge of their disease.

**Objectives:** The objectives of this study were to explore self-management practices among type 2 diabetes patients visiting physicians and pharmacists, and to assess the differences in the self-management practices of patients who visit physicians and those who visit pharmacists concerning type 2 diabetes in the past two years.

**Methods:** This exploratory study recruited 363 established type 2 diabetes patients using a simple random sampling technique. The patients had consulted either a physician or pharmacist (but not both) over the past two years in relation to their type 2 diabetes, and physically visited a branch of a private-chain retail pharmacy in Lahore, Pakistan. Face-to-face interviews and structured questionnaires with a few open-ended questions were adopted as methods of data collection, focusing on socio-demographic and clinical factors, and the standard self-management practices of patients. Data were analyzed using frequencies, percentages, means and standard deviations. The difference between categorical variables, i.e. self-management practices and visits to healthcare professionals, were determined using chi-square tests.

**Results:** The results showed that none of the standard diabetes self-management practices were fully adhered to by the patients. The use of the HbA1C test to monitor diabetes was the least used test among diabetic patients visiting a physician (29.60%) or pharmacist (25.70%). Patients visiting pharmacists adhered to medication use (88.50%,  $p < 0.001$ ), eating a well-balanced diet (75.22%,  $p = 0.050$ ), blood glucose level check (88.50%,  $p < 0.001$ ) and regular blood pressure monitoring (81.42%,  $p < 0.001$ ), whereas patients visiting physicians adhered better to daily feet checking (69.20%,  $p < 0.001$ ) and regular exercise (74.80%,  $p < 0.001$ ).

**Conclusions:** Our study indicates that there is a significant fluctuation in adherence to key self-management practices among type 2 diabetes patients who visit physicians and those who visit pharmacists. Increasing the numbers of pharmacists in the healthcare system who have a special focus on diabetes may improve self-management practices among diabetic patients. [*Ethiop. J. Health Dev.* 2020; 34(3):000-000]

**Key words:** Pharmacists, physicians, consultation, type 2 diabetes, self-management

## Introduction

Diabetes occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces (1). There are two major types of diabetes, type 1 and type 2. Type 1, formerly known as insulin-dependent diabetes or child-onset diabetes, is a life-long condition affecting children, young people and adults worldwide, whereas type 2 diabetes is non-insulin dependent and closely linked with obesity and a sedentary lifestyle (2).

The global prevalence of diabetes among adults over 18 years of age was 8.5% in 2014 and has risen rapidly in middle- and low-income countries (3). In South Asia, the countries of India, Pakistan and Bangladesh are among the top 10 countries globally in terms of the proportion of the population living with diabetes (1). The mean prevalence of type 2 diabetes mellitus in Pakistan is 11.77% (4). Type 2 diabetes cannot be cured permanently; however, complications and premature death can be prevented by changing daily routines and adopting healthy lifestyles that include regular exercise, a balanced diet, avoiding unhealthy food, avoiding

smoking, and controlling blood pressure and lipids (4-6).

The huge financial burden of controlling diabetes requires healthcare professionals to play an active role in educating diabetic patients in self-management practices (7). In Pakistan, the healthcare sector receives less than 1% of gross domestic product (8). A lack of funding may be explained by the mismatch between healthcare needs (207.77 million people live in Pakistan) and the availability of services (one physician per 957 people) (9). In response, pharmacists, who are the third-largest group of health professionals in the country, play a multifaceted role within different tiers of the healthcare system, especially in low resource settings (10,11). Unfortunately, the workforce of licensed pharmacists in the healthcare system is also meagre, with only one pharmacist per doctor and only 0.61 per 10,000 people (11).

Self-management practices are important to control diabetes and prevent complications (12). Besides rational therapeutic approaches, patient counseling by a

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healthcare professional is crucial because self-management practices are generally influenced by the patient's knowledge about their disease (12). Despite their limited numbers, pharmacists play an important role in the healthcare system of Pakistan. Pharmacists are easily accessible at community pharmacies in the major cities of Pakistan and can provide expert advice on diabetes, lifestyle modifications, and counseling about prescriptions and the value of better glycemic control (12). Normally, diabetic patients visit pharmacies to get their blood glucose and blood pressure monitored (12,13). However, the scope of pharmacists concerning complete management of diabetes is limited because they cannot prescribe medicines, although they can suggest alternatives over-the-counter drugs (14). A randomized control trial conducted in Lahore showed that intervention by pharmacists in collaboration with physicians resulted in significant improvements in blood pressure, and lipid and glycemic controls of patients suffering from type 2 diabetes (15).

A healthcare professional can help improve the health status and quality of life of patients suffering from type 2 diabetes. To date, few studies have focused on patients' self-management practices to cope with non-communicable diseases such as diabetes, and how these are affected by the likelihood of visiting pharmacists and physicians. Therefore, this study was conducted to explore the self-management practices of patients who visited physicians and pharmacists in relation to their type 2 diabetes in the past two years, and to determine the differences between the self-management practices of those who visited physicians and those who visited pharmacists.

## Methods

**Study design and setting:** This exploratory study was conducted between January and March 2018 at three branches of a private-chain retail pharmacy in Lahore, Pakistan. The branches were selected on the basis that they: (i) had a designated pharmacist available for patient counseling; (ii) were located within a one-kilometer radius of public tertiary care hospitals serving the majority of the population belonging to different socio-economic strata.

**Sample size and sampling technique:** The minimum sample size needed to maintain a 5% margin of error and a 95% confidence interval was calculated as 382 using the Raosoft sample size calculator (16). A sample of 363 patients was selected for this study by employing a simple random sampling technique using a random number table.

**Participant recruitment:** One pharmacist and one researcher reviewed the prescriptions of walk-in customers and identified potential study participants who presented with type 2 diabetes prescriptions. Patients were eligible only if they were 18 years of age or older with at least a two-year history of type 2 diabetes; they visited the pharmacy in person; and had consulted a healthcare professional – either a physician or a pharmacist (but not both) – over the past two years in relation to type 2 diabetes. Those patients who did not provide written informed consent and those who could

not understand the locally spoken languages were excluded from the study. The patients were asked to respond to their pattern of self-management practices for the past two years at the time of the survey. This maximum time duration of two years was chosen because it was recent enough for diabetic patients to recall their self-management practices in detail (8,17).

**Questionnaire development:** The authors developed a structured questionnaire, with a few open-ended questions, based on relevant literature and reliable and validated scales (10,18-21). The questionnaire was further validated by asking two private endocrinology consultants in Lahore to provide their expert opinions on the content of the study questionnaire in terms of its importance, relativity and simplicity. Also, the questionnaire was pretested with 10 participants to assess acceptability and ease of understanding of the questions.

**Data collection:** A separate booth was established in each retail pharmacy with a sitting capacity of at least two people. The researcher conducted face-to-face interviews, each typically lasting between 10 and 15 minutes. The study questionnaire was in two parts:

**Demographic and clinical profile:** Seven questions were included in this section that assessed patients' demographic information and clinical characteristics. Patients were asked to describe their gender, age (in years), education (in years), average monthly household income in Pakistani rupees (PKR), marital status, history of type 2 diabetes (in years) and family history of diabetes.

**Self-management practices:** Ten survey items explored the patterns of patients' self-management practices, i.e. practices undertaken by patients to effectively manage the disease on their own after consulting healthcare professionals. Information was collected as nominal variables (no or yes) for 'cigarette smoking', 'daily feet checking', 'daily medication use', 'exercising at least 20–30 minutes per day for at least five days per week', 'eating a well-balanced, planned diet', 'checking random blood glucose level at least once every three months', 'checking blood sugar at home, as per health practitioners' recommendations', 'checking HbA1C levels every three months', 'use of stress management techniques' and 'checking regular random blood pressure monitoring'.

**Statistical analysis:** Data were analyzed using Statistical Package for Social Sciences software (SPSS version 26.0, SPSS Inc., Chicago, IL, USA). Frequencies, percentages, means and standard deviations were the primary analytical methods used for the data. A chi-square analysis was rendered to determine the difference between the self-management practices of patients who visited physicians and those who visited pharmacists concerning type 2 diabetes.

## Ethical approval

The study was approved by the Ethical Review Committee, University of Health Sciences, Lahore, Pakistan (No. UHS/REG-18/ERC/185). This study

followed international ethical guidelines for health-related research involving humans (22). Before data collection, patients were provided with information leaflets in the local language describing the risks and benefits of the study, and the ethical approval and provisions to maintain confidentiality. Each interview was conducted after the participant had provided written informed consent.

### Results

The average age of the patients visiting physicians and pharmacists was  $45.2 \pm 11.0$  and  $46.8 \pm 10.3$  years,

respectively (Table 1). Of the 363 patients, gender distribution showed more male participants than females in both groups. The education level of patients who visited a physician was marginally higher compared to those who visited a pharmacist. Table 1 further delineates that 74.8% of patients who visited physicians and 77.0% patients who visited pharmacists were married. Patients' history of suffering from type 2 diabetes was  $7.5 \pm 2.6$  years for those who visited physicians, and  $7.0 \pm 2.9$  years for those who visited pharmacists.

**Table 1: Demographic and clinical profile of patients (n = 363)**

Demographic characteristics	Physicians (n = 250)		Pharmacists (n = 113)	
	n (%)	Mean $\pm$ SD	n (%)	Mean $\pm$ SD
Age (years)	-	45.2 (11.0)	-	46.8 (10.3)
Gender	Male	169 (67.6)	72 (63.7)	-
	Female	81 (32.4)	41 (36.3)	-
Marital status	Married	187 (74.8)	87 (77.0)	-
	Unmarried	63 (25.2)	26 (23.0)	-
Education (years)	-	6.5 (6.3)	-	5.9 (5.9)
Monthly household income (PKR)	-	46756.0 (16747.2)	-	47597.3 (17367.2)
History of type 2 diabetes (years)	-	7.5 (2.6)	-	7.0 (2.9)
Family history of diabetes	158 (63.2)	-	72 (63.7)	-

Table 2 compares the self-management practices of patients who visited physicians and those who visited pharmacists concerning type 2 diabetes. When comparing patients' tendency to maintain their drug regimens, 88.50% of patients who visited pharmacists adhered to their regimen, compared to 56.40% of patients who visited physicians (chi-square value = 35.928 with 1 df,  $p = 0.001$ ). Table 2 also shows that there was a significant difference between those who visited physicians and those who visited pharmacists in terms of checking random blood glucose level at least

once every three months ( $p = 0.001$ ), checking regular random blood pressure monitoring ( $p = 0.001$ ), daily feet checking ( $p = 0.001$ ), exercising ( $p = 0.001$ ) and eating a well-balanced, planned diet ( $p = 0.050$ ). There was no significant difference in the two groups in relation to a few self-management practices, including checking HbA1C levels every three months, checking blood sugar at home as per health practitioners' recommendations, cigarette smoking, and use of stress management techniques.

**Table 2: Comparison between patients' self-management practices and healthcare practitioners attended**

Self-management practices	Physician	Pharmacist	Chi-square	P-value
	n = 250 n (%)	n = 113 n (%)		
Daily medication use	141 (56.40)	100 (88.50)	35.928	<0.001*
Checking HbA1C levels every three months	74 (29.60)	29 (25.66)	0.593	0.261
Checking random blood glucose level at least once every three months	139 (55.60)	100 (88.50)	37.444	<0.001*
Checking blood sugar at home, as per health practitioners' recommendations	178 (71.20)	75 (66.37)	0.859	0.210
Checking regular random blood pressure monitoring	116 (46.40)	92 (81.42)	39.00	<0.001*
Daily feet checking	173 (69.20)	39 (34.51)	38.542	<0.001*
Cigarette smoking	113 (45.20)	51 (45.13)	0.001	0.541
Eating a well-balanced, planned diet	165 (66.00)	85 (75.22)	3.087	0.050*
Exercising at least 20–30 minutes per day for at least five days per week	187 (74.80)	50 (44.25)	32.055	<0.001*
Use of stress management techniques	112 (44.80)	51 (45.13)	0.003	0.521

## Discussion

None of the standards of diabetes self-management were fully adhered to by the patients. The use of the HbA1C test to monitor diabetes was the least used test among diabetic patients who visited physicians and pharmacists. Patients who visited pharmacists adhered better to medication use, eating a well-balanced diet, blood glucose level check and regular blood pressure monitoring, whereas patients who visited physicians adhered better to daily feet checking and regular exercise. In general, the results demonstrate that patients' decisions to visit a physician or a pharmacist had significant impacts on their self-management practices related to type 2 diabetes.

In developing countries such as Pakistan, treatment costs impose a significant financial burden on a patient's household, and healthcare is often not affordable for individuals with low socio-economic backgrounds (23,24). Generally, patients with low socio-economic backgrounds struggle to maintain routine visits to their physicians due to practice charges. Therefore, socio-economic status might also be a significant factor in determining if patients seek consultancy from either a physician or a pharmacist (24). On the other hand, the increasing trend of consulting pharmacists might also be due to the absence of pharmacist counseling fees in Pakistan (25).

A combination of physicians and pharmacists promoting diabetes education may result in better health outcomes by improving the standard of self-management practices among diabetic patients (26). Generally, patients visiting a pharmacist adhere better to therapy because of the specific role of pharmacists in counseling, educating patients about the appropriate use of medication, and providing drug information (27). On the other hand, it has been reported that patients adhere less to medication use as advised by the physician because their focus is the diagnosis and drug therapy without focusing on counselling and lifestyle modifications (28). Although the role of physicians in medication adherence is important, another aspect that could determine patients' adherence to drugs therapy is the physician's style of communication (29). Kassahun *et al.* (2016) show that physicians who focus on educating their patients about diabetes self-management and involve them in the decision-making process of treatment plans are more likely to motivate their patients to use medication regularly (19). Therefore, consistent with our study results, the highest rate of medication adherence was seen among those patients who visited pharmacists (29).

Another important aspect of diabetes management is random blood glucose monitoring, which is also associated with achieving good glycemic control (30). The role of pharmacists in improving the self-management practices of patients is substantial, as they are uniquely positioned in the healthcare setting to guide patients and enable them to exert control over their diabetes through continuous monitoring of blood glucose levels (31,32). In line with our study results, other studies indicate that pharmacists' intervention in collaboration with that of physicians results in

significant improvements in blood pressure, and lipid and glycemic controls of patients suffering from type 2 diabetes (15,31,32).

Patients with diabetes may also suffer from uncontrolled hypertension, which may result in cardiovascular disease leading to death (33). Therefore, one of the important self-management practices for diabetic patients is monitoring blood pressure regularly. The results of the present study are consistent with the findings of a study that examined the effectiveness of blood pressure monitoring and improvement of diabetic symptoms by using pharmaceutical care (33). Another study showed that the most effective strategy for managing blood pressure was to assign the patient to a physician accompanied by an allied health professional (34). As pharmacists have expertise in drug therapy, they can also significantly contribute to helping to manage blood pressure because the primary method of controlling blood pressure is through medication (35).

According to one study, exercise training programs developed for diabetic patients reduced HbA1C level by 0.66%, which can drastically decrease the complications associated with diabetes (36). Physicians have been known to help increase levels of exercise in their patients (37), which is a finding of the present study. Another factor that determines a physician's role in promoting exercise might be the patient-physician relationship (38). In this regard, it has been suggested that the traditional physician-patient role needs to be revamped in a way that encourages physicians to pay greater attention to patients' concerns (38). In return, patients should also become more proactive in managing the symptoms of their disease, which ultimately would build an equitable relationship to improve self-management (38). Last but not least, foot care is also of great importance for diabetic patients, as the absence of proper foot care for complications such as foot ulcers may lead to amputation (39). Physicians play an important role in encouraging daily feet checking, however, in contrast to the present study, in a study conducted in Italy, more than 50% of patients did not have their feet checked and were not educated about proper foot care by their physicians (40).

## Limitations of this study

Although this study provides valuable insights into the self-management practices of patients with diabetes who visited different practitioners, it does have some limitations. First, the experiences and socio-economic profiles of patients in other settings may differ. Future, larger-scale surveys could supplement the present findings to strengthen the conclusions about self-management practices among patients with diabetes. Second, this study could not explore the reasons for consulting pharmacists instead of physicians. How self-management practices are affected by healthcare professionals and whether this impacts on health outcomes is another area for future research.

## Conclusions

Our study indicates that there is a strong variability in adherence to key self-management practices among type

2 diabetes patients who visit physicians and pharmacists. The role of the pharmacist demonstrated significant improvements in key self-management areas. Therefore, increasing the numbers of pharmacists with a special focus on diabetes in the healthcare system may improve self-management practices among diabetic patients, such as adherence to medication, dietary habits, and regular monitoring of blood glucose levels and blood pressure.

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### Conflicts of interest

No conflicts of interest are associated with this work.

### Contribution of authors

The authors declare that this work was conducted by the authors named in the article and all liabilities pertaining to claims relating to the content of this article will be borne by them.

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