

## Research Article

# Knowledge and Perceptions of Prescribers Regarding Adherence to Standard Treatment Guidelines for Type II Diabetes. A Comparative Cross-Sectional Study From Pakistan

Madeeha Malik<sup>1</sup> Azhar Hussain<sup>1</sup> Javaid Iqbal<sup>1</sup> Muhammad Shafiq<sup>1</sup> Muhammad Kamran Naqi<sup>2</sup> and Yasser Shahzad<sup>3</sup>

<sup>1</sup>Hamdard Institute of Pharmaceutical Sciences Hamdard University, F-8 Markaz, Johar Road Islamabad, Pakistan

<sup>2</sup>Hamdard Institute of Management Sciences, Hamdard University, F-8 Markaz, Johar Road Islamabad, Pakistan

<sup>3</sup>Division of Pharmacy and Pharmaceutical Sciences, University of Huddersfield, Huddersfield, UK

## ABSTRACT

This study aimed to explore the perceptions and knowledge of prescribers towards adherence to standard treatment guidelines for type II diabetes in two cities of Pakistan; Islamabad (national capital) and Rawalpindi (twin city). A comparative, cross sectional study design was used to evaluate the knowledge and perceptions of prescribers regarding adherence to standard treatment regimen for type II diabetes. The study population included private clinics as well as tertiary care hospitals of both private and public sectors of Islamabad and Rawalpindi. Prescribers specifically dealing with type 2 diabetes mellitus were targeted. A questionnaire was developed through focused group discussions and distributed randomly to a sample of 360 prescribers in the two cities. Chi-Squared test ( $p \leq 0.05$ ) was used to compare the knowledge of prescribers (regarding standard diabetes regimen) having different levels of experience and practicing in public and private healthcare facilities in the two cities. The results of the present study showed that the overall knowledge of prescribers regarding standard treatment regimen for diabetes in the two cities of Pakistan was inadequate. No significant difference ( $p \leq 0.05$ ) among the knowledge of prescribers (regarding standard treatment regimen for diabetes) having different levels of experience and working in different sectors of healthcare facilities in the two cities was observed. The results of the present study highlighted poor management of diabetes due to lack of awareness of prescribers and unavailability of standard treatment guidelines for diabetes in the healthcare facilities in Pakistan.

**Keywords:** Adherence, Knowledge, Diabetes, Pakistan, Standard treatment guidelines, Type II.

## INTRODUCTION

The incidence of diabetes is increasing day by day globally and is the fourth leading cause of death in the developed countries<sup>1</sup>. The estimated number of diabetic patients in the world was 135 million in 1995, which increased 151 million in 2000, and is expected more than 75% of the diabetic patients will be from the developing countries in 2025<sup>2</sup>. It is difficult to achieve improved management of diabetic patients using traditional physician's approaches, lacking computerized tracking systems and adherence to standard treatment guidelines<sup>3</sup>. Adherence to clinical guidelines not only improves health care

outcomes, but also reduces cost of therapy and increases compliance of patients. Patients treated in accordance with the recommended diabetes guidelines were reported to be more satisfied with their care<sup>4</sup>. Various studies have reported major dissimilarities between current prescribing practices and the recommended standard treatment guidelines. The studies have highlighted the need of educational and training programs with continuous surveillance for improving knowledge, attitude and practice of physicians<sup>4,5</sup>.

Approximately, 21.7% people of the total population are diabetics in Pakistan, out of which 11.1% are male while 10.6% are

females<sup>6</sup>. Appropriate management of diabetes mellitus is an essential element to combat the disease and improve quality of life of diabetic patients. Adherence to the standard treatment guidelines by the prescribers can reduce the associated complications in diabetic patients, but is not true in case of Pakistan<sup>7-8</sup>. Unavailability of treatment guidelines, their weak implementation and inadequate knowledge and training of the prescribers on standard treatment guidelines are the major factors towards irrational treatment practices and poor control of the disease. Peer influence and that of pharmaceutical companies also greatly affects the prescribing trends and beliefs of the physicians in Pakistan. Limited data is available in this regard thus; the present study was designed to explore the perceptions and knowledge of prescribers towards adherence to national standard treatment guidelines for type II diabetes in the two cities of Pakistan; Islamabad (national capital) and Rawalpindi (twin city).

## **Methodology**

### **Study Design**

A descriptive, cross sectional study design was used to evaluate the adherence of prescribers to the standard treatment guidelines of type II diabetes mellitus in two major areas of Pakistan namely Islamabad (national capital) and Rawalpindi (twin city).

### **Study population**

The study population included private clinics as well as tertiary care hospitals of both private and public sectors of Islamabad and Rawalpindi. Prescribers specifically dealing with type 2 diabetes mellitus were targeted. Basic health units, secondary health care centers as well as the diabetic patients are excluded from the study.

### **Sampling of facilities and respondents**

First of all a list of diabetic centers and private clinics was obtained. All the diabetic centers were included while convenient sampling technique was used to select private clinics. A list of all the registered prescribers in Islamabad and

Rawalpindi was obtained and sample size was calculated using formula by Israel glen which was ( $n = 382$ ) at 95% C.I.<sup>9</sup>. The study was approved by the experts at diabetes program and respective MS of all the diabetic clinics in the tertiary care hospitals involved in the study. Respondents were informed regarding the study verbal and written consent was taken from respondents for participating in study.

### **Study Tool**

A questionnaire was developed by focused group discussions and using the references of American diabetic standard treatment guidelines. Focus group discussions were carried out with physicians, diabetic specialists and professors of academia for development and finalization of data collection tool. Face and content validity was built through panel of diabetes experts, consultants, statistician and pilot testing. The value of cronbach's alpha was 0.726 which was applied to assess the reliability and internal consistency of the tool. The questionnaire comprised of four sections was developed.

The first section was for demographic data of each subject such as gender, working place and years of experience in medicine were included. In the second section, participants were asked questions regarding their awareness and perception on available anti-diabetic agents and standard treatment guidelines. The perceptions regarding preferred initial treatment, anti diabetics and combination therapy were the component of this section. The contributing factors towards lack of adherence of standard treatment guidelines patient related factors, availability & accessibility of the guidelines for reference, prescribers experience /personal preference and lack of guideline enforcement were also enquired. In third section, the practicing pattern regarding diabetes was also assessed. Section two and three of the questionnaire included a set of statements in which the respondents were asked to indicate their level of agreement with, using a 4-point Likert scale, where 1 = strongly disagree; 2 = disagree; 3 = agree; and 4 = strongly

agree. A four-point Likert scale was used in order to avoid confusion with the neutral responses. In the last section, the knowledge regarding appropriate dosages of anti-diabetic agents was explored.

### Data collection and analysis

Two teams, one in each city comprising of ten data collectors in each team were trained by the group of experts including principal investigator<sup>10</sup>. The questionnaire was hand-delivered by the data collectors. The data were computed and analyzed by using Statistical Package for Social Sciences (SPSS, version 16) and descriptive analysis was conducted. The results of each item in the questionnaire were reported as percentages and frequencies. Chi-Squared test ( $p \leq 0.05$ ) was used to compare the knowledge of prescribers (regarding standard diabetic regimen) having different level of experiences practicing in public and private healthcare facilities in the two cities.

## RESULTS

### Demographics

Out of 382 prescribers, 41 % (n = 157) were working in public sector while 59 % (n= 225) were from the private sector. Regarding the experience of the prescribers, 11.7 % (n=44) had experience of less than one year, 30.6 % (n= 117) had experience of 1-5 years, 26.9 % (n= 103) had experience of 6-10

years and 30.8 % (n= 118) had experience of more than 10 years.

### Perceptions of prescribers regarding management of type II diabetes mellitus in healthcare system of Pakistan

The results showed that 12.6% (n=19) prescribers disagreed that the current available drugs in the hospital are effective where as 87.3% (n=131) agreed with the mentioned statement. Similarly 22.7% (n=34) were not in the opinion to give combination therapy while 77.7% (n=116) agreed that combinational therapy is beneficial in treatment of diabetes. 36% (n=54) relates STGs with cost effectiveness positively but 64% (n=96) opposed the statement. For the conduction of educational programs in the proper treatment of diabetes mellitus treatment 5.3% (n=8) disagreed and rest of the prescribers i.e. 94.7% (n=142) agreed the statement. Twenty one percent (n=3.2) of health care facilities had diabetes STG's available in them on the other hand 78.7% (n=118) did not have the guidelines to treat diabetes mellitus Results revealed that to increase the compliance of diabetic patients, 6.7 % (n=10) of the prescribers preferred verbal counseling, 50 % (n=75) used diet charts, while 43.4 % (n=65) of prescribers preferred diet chart along with verbal counseling (Table 1).

**Table 1: Perceptions of prescribers regarding management of type II diabetes mellitus in healthcare system of Pakistan**

Sr. no	Indicators	Prescribers n = 382	
		Strongly. Agree + Agree n (%)	Strongly. Disagree + Disagree n (%)
1.	Effectiveness of current anti diabetic drugs	303 (79.3%)	79 (20.7%)
2.	Effectiveness of anti diabetic combination therapy	273 (71.4%)	109 (28.6%)
3.	Availability of Standard Treatment Guidelines	105 (27.4%)	277 (72.6%)
4.	Effect of STGs on cost effectiveness	143 (37.4%)	239 (62.6%)
5.	Effectiveness of verbal patient counseling	61 (15.9%)	321 (84.1%)
6.	Effectiveness of use of diet charts for patient counseling	191 (50%)	191 (50%)
7.	Effectiveness of verbal + diet charts for patient counseling	171 (44.7%)	211 (55.3%)
8.	Need of health professionals training programs for diabetes management	325 (85%)	57 (15%)

### Perceptions of prescribers regarding factors effecting adherence to standard treatment guidelines

The result showed that various factors effecting adherence to standard treatment guidelines were: patient related factors (80.3 %, n = 307), unavailability of

guidelines (78.3 %, n = 299), lack of awareness of the prescribers regarding guidelines (73.5 %, n = 281), prescribers experience (77.2 %, n = 295) and lack of guidelines enforcement (68.5 %, n = 262) (Table 2).

**Table 2: Perceptions of prescribers regarding factors effecting adherence to standard treatment guidelines**

Sr. no	Indicators	Prescribers n = 382	
		Strongly. Agree + Agree n (%)	Strongly. Disagree + Disagree n (%)
1.	Patient Related Factors	307 (80.3%)	75 (19.7%)
2.	Unavailability Of Guidelines	299 (78.3%)	83 (21.7%)
3.	Lack Of Awareness regarding STG	281 (73.5%)	101 (26.5%)
4.	Prescriber's Experience	295 (77.2%)	87 (22.8%)
5.	Lack Of Guidelines Enforcement	262 (68.5%)	120 (31.5%)

### Perceptions of prescribers regarding effectiveness of anti-diabetic agents used in Pakistan

Regarding the effectiveness of anti-diabetic agents, Glemipiride 75.1 % (n = 285) and Metformin + Glemipiride 73.5%

(n = 281) were considered as most effective anti-diabetic agents while Glibenclamide 41% (n = 157) as least effective anti-diabetic agent. A detail description of effectiveness of different anti-diabetic agents is given in (Table 3).

**Table 3: Perceptions of prescribers regarding effectiveness of anti-diabetic agents used in Pakistan**

Sr. no	Anti diabetic drugs	Prescribers n = 382	
		Most Effective n (%)	Least Effective n (%)
1.	Metformin	261 (68.3%)	121 (31.7%)
2.	Pioglitazone	257 (67.2%)	125 (32.8%)
3.	Gliclazide	261 (68.3%)	121 (31.7%)
4.	Glemipiride	287 (75.1%)	95 (24.9%)
5.	Metformin + Glemipiride	281 (73.5%)	101 (26.5%)
6.	Metformin + Pioglitazone	253 (66.2%)	129 (33.8%)
7.	Metformin + Gliclazide	263 (68.8%)	119 (31.2%)
8.	Glibenclamide	157 (41%)	225 (59%)

Chi-square test was used to asses' relationship among knowledge of prescribers regarding standard dosage regimen of type II diabetes with different levels of experience working in different

sectors. There was no significant relation ( $p \leq 0.05$ ) in knowledge of prescribers with different levels of experience working in different sectors (Table 4).

**Table 4: Comparison of knowledge of prescribers regarding standard treatment regimen for type II diabetes with different levels of experience practicing in different sectors in twin cities**

Variables	Knowledge regarding standard treatment regimen of diabetes	
	n	P- value
Sector	Public n = 157 Private n = 225	0.457
Experience	Less than one year = 44 1-5 years = 117 6-10 years = 103 More Than 10 years = 118	0.503

Chi-Squared test  $p \leq 0.05$

## DISCUSSION

Adherence to clinical guidelines improves health care outcomes, reduces expenditure and prevents the complications of unnecessary interventions. The results of the present study highlighted poor management of diabetes due to lack of awareness of prescribers and unavailability of standard treatment guidelines for diabetes in the healthcare facilities in Pakistan. This might be due to lack of interest of regulators in its enforcement in the healthcare system. Low adherence to standard treatment guidelines and availability was reported by a study conducted in Indiana<sup>11</sup>.

Physicians who manage type 2 diabetes mellitus have different views about effectiveness of individual anti-diabetic agent and combinational therapy. The results of the present study showed that metformin and glimepride were most frequently used anti-diabetic agents to achieve the best outcomes. While in view of most of the prescriber's combination therapy is more effective when single agent cannot manage the severity of diabetes mellitus and mostly combination of metformin and glemipride was preferred. Combination therapy had a more pronounced effect in managing the diabetic patients, while switching from one individual drug to another single agent in management of diabetes mellitus was also witnessed by various studies<sup>12-15</sup>.

Earlier detection of diabetes, health education of community and patients regarding diabetes and related complications cannot only reduce the overall cost of treatment but can also increase patient compliance and control of disease in Pakistan<sup>16-17</sup>. The present study revealed diet charts along with verbal counseling as the most effective tool by the prescribers in increasing patient compliance. Similarly, balanced diet plans given by prescribers/pharmacist to treat diabetic patients proved helpful in increasing compliance of diabetic patients in India<sup>18</sup>.

The results of present study highlighted no significant difference in the knowledge of prescribers having different levels of experience regarding the standard treatment regimen for the treatment of

type II diabetes practicing in public and private healthcare facilities. Most of the prescribers highlighted the need for implementation of STGs in daily practice for the appropriate management and control of diabetes. Similarly, awareness and education programs were recommended to update the knowledge of family physicians of early detection and management of diabetes mellitus in Pakistan<sup>19-21</sup>.

## CONCLUSION

The overall knowledge of prescribers regarding standard treatment regimen for diabetes in the two cities of Pakistan was inadequate. Most of the prescribers were unaware of correct standard treatment regimen for the treatment of type II diabetes mellitus. Even vast experience of prescribers did not translated into better knowledge regarding standard treatment regimen for diabetes. This highlights need for innovative approaches to promote and implement standard treatment guidelines in the public as well as private sectors of healthcare system to improve the knowledge and adherence of prescribers with standard treatment guidelines which will result in better practices and control of diabetes in the country.

## REFERENCES

1. King H, Aubert R and Herman W. Global burden of diabetes, 1995–2025: prevalence, numerical estimates, and projections. *Diabetes Care*. 1998;21:1414–31.
2. Aekplakorn W, Stolk RP, Neal B, Suriyawongpaisal P, Chongsuvivatwong V, Cheepudomwit S, et al. The prevalence and management of diabetes in Thai adults. *Diabetes Care*. 2003;26(10):2758-63.
3. Bodenheimer T, Lorig K, Holman H, Grumbach K. Patient self-management of chronic disease in primary care. *JAMA: the journal of the American Medical Association*. 2002;288(19):2469-75.
4. Gross R, Tabenkin H, Porath A, Heymann A, Greenstein M, Porter B, et al. The relationship between primary care physicians' adherence to

- guidelines for the treatment of diabetes and patient satisfaction: findings from a pilot study. *Family practice*. 2003;20(5):563-9.
5. Guisasola FA, Povedano ST, Krishnarajah G, Lyu R, Mavros P, Yin D. Hypoglycaemic symptoms, treatment satisfaction, adherence and their associations with glycaemic goal in patients with type 2 diabetes mellitus: findings from the Real-Life Effectiveness and Care Patterns of Diabetes Management (RECAP-DM) Study. *Diabetes, Obesity and Metabolism*. 2008;10:25-32.
  6. Kamal A, Itrat A, Murtaza M, Khan M, Rasheed A, Ali A, et al. The burden of stroke and transient ischemic attack in Pakistan: a community-based prevalence study. *BMC neurology*. 2009;9(1):58.
  7. Cramer J, Benedict A, Muszbek N, Keskinaslan A, Khan Z. The significance of compliance and persistence in the treatment of diabetes, hypertension and dyslipidaemia: a review. *International journal of clinical practice*. 2008;62(1):76-87.
  8. Triplitt C, McGill JB, Porte D, Conner CS. The changing landscape of type 2 diabetes: the role of incretin-based therapies in managed care outcomes. *Journal of Managed Care Pharmacy*. 2007;13(9):2.
  9. Israel GD. Determining sample size: University of Florida Cooperative Extension Service, Institute of Food and Agriculture Sciences, EDIS; 1992.
  10. Rational Pharmaceutical Management Plus Program. Pharmaceutical Management for Malaria. USA: U.S. Agency for International Development 2004.
  11. Kirkman MS, Williams SR, Caffrey HH, Marrero DG. Impact of a program to improve adherence to diabetes guidelines by primary care physicians. *Diabetes Care*. 2002;25(11):1946-51.
  12. Van Gaal L, De Leeuw I. Rationale and options for combination therapy in the treatment of type 2 diabetes. *Diabetologia*. 2003;46:44-50.
  13. Nathan DM. Initial management of glycemia in type 2 diabetes mellitus. *New England Journal of Medicine*. 2002;347(17):1342-9.
  14. Herman WH, Hoerger TJ, Brandle M, Hicks K, Sorensen S, Zhang P, et al. The cost-effectiveness of lifestyle modification or metformin in preventing type 2 diabetes in adults with impaired glucose tolerance. *Annals of Internal Medicine*. 2005;142(5):323-32.
  15. Kahn SE, Haffner SM, Heise MA, Herman WH, Holman RR, Jones NP, et al. Glycemic durability of rosiglitazone, metformin, or glyburide monotherapy. *New England Journal of Medicine*. 2006;355(23):2427-43.
  16. Rafique G, Shaikh F. Identifying needs and barriers to diabetes education in patients with diabetes. *Age (years)*. 2006;18(30):31-50.
  17. Chowdhury MS, Tofail Ahmed M, Zia-Ur-Rahman SN, Siddique SF, Chowdhury T, Hai M, et al. Knowledge Assessment of Diabetic Patients: A Cross Sectional Study.
  18. Mehta D, Vali S. *Speaking of Diabetes and Diet*: New Dawn Press, The; 2005.
  19. Hasan Z, Zia S, Maracy M. Baseline disease knowledge assessment in patients with type 2 diabetes in a rural area of northwest of Pakistan. *JOURNAL-PAKISTAN MEDICAL ASSOCIATION*. 2004;54(2):67-72.
  20. Rogulj ZM, Baloevic E, Dogas Z, Kardum G, Hren D, Marusic A, et al. Family medicine practice and research: Survey of physicians' attitudes towards scientific research in a post-communist transition country. *Wiener Klinische Wochenschrift*. 2007;119(5):164-9.
  21. Jawad F, A. B. Diabetes related knowledge, attitude and practices of family physicians in Pakistan. *JPMA*. 2002;52(10):465-69.