MASTER OF SCEINCE IN PUBLIC HEALTH

Prescriber's experience and satisfaction regarding standard treatment guidelines for the diabetes mellitus type 2 in Rawalpindi and Islamabad

BY

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<u>DEDICATION</u>

This study wholeheartedly dedicated to my parents, who have been my source of inspiration and gave us strength when we thought of giving up, who continually provide their moral, spiritual, emotional, and financial support. In the end i dedicate this work to the Almighty ALLAH for the supremacy and to redeemer of my soul.

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List of Abbreviations

BHU: Basic health unit

EDL: Essential drug list

PCP: Primary care physician

STGs: Standard treatment guidelines

TCH: Tertiary care hospital

WHO: World health organization

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CHAPTER # 01

INTRODUCTION

1 Introduction

Diabetes mellitus is a group of metabolic disorders, which occurs when the pancreas is not able to produce enough insulin, or when the body cannot efficiently use the insulin, leading to high concentration of glucose in the blood (Kumar.V et al,.2007) Diabetes mellitus is broadly classified into type 1 and type 2 diabetes mellitus. In type 1 diabetes mellitus, there is an absolute deficiency of insulin secretion due to destruction of beta cells of pancreas, while type 2 diabetes mellitus is caused by the combination of inability of insulin action and inadequate response of insulin secretion by the beta cells of pancreas (Kumar..v et al,.2007). A person is considerd as diabetic when the kidney threshold level of sugar exceeds 180 mg/dL. The incidence of diabetes is rising in the world day by day and it has become the fourth leading cause of death in the developed countries [3]. In the developed world, it has been recorded that the prevelance of diabetes mellitus is more common in the old age group (King.H et al,.1995-2025). In 1995, the estimated number of diabetic patients in the world was 135 million which increased to a number of 151 million in 2000 (King.H et al,. 1995). By 2025, it is expected that there would be diabetics all over the globe (King.H et al,. 1998) and more than 75% of the diabetic patients will be from the developing countries [7]. In Pakistan, there are almost 21.7% people are diabetics, among which the male gender accounts for 11.1% whil e the female gender accounts for 10.6% of the total population (Shera S et al,. 1998) .The prevalence rate of type 2 diabetes mellitus in young people is 10% and approximately 6.5 million people of 25 years age and above age are affected by diabetes mellitus in the country. (Shera AS et al 1999)This pattern of onset at a younger age is extending the burden of therapy and complications to the younger age group. The general treatment approach of type 2 diabetes mellitus involves the diet modification, exercise and use of pharmacological therapy .i.e. oral hypoglycemic agents and insulin in severe cases. Factors contributing to optimum management of diabetes include age, complexity of treatment, and duration of disease, depression, and psychosocial issues (Cramer JAet al,.1999). In order to control this disease in Pakistan, it is important for each country to follow the standard treatment guidelines and prescribers should properly adhere to the respective guidelines of diabetes

mellitus while treating the diabetic patients (Sharma S et al,.2009). Adherence refers to how closely a patient follow a treatment regimen prescribed to him. It includes his willingness to start treatment and his ability to take medications exactly as directed. Adherence to follow standard treatment guidelines by the respective physicians is an important point to be focused (Catherine A et al,.1998). Adherence of prescribers to STGs involves how appropriate they prescribe and administer the medications to the diabetic patients. Because there are variety of factors that make the prescribing practices different for individual patients and require guidance from the STGs.

1.1. Factors promoting satisfaction of the prescribers

The factors that can promote the experience and satisfaction of prescribers towards the standard treatment of diabetes mellitus includes prescribing, cost and the standard treatment guidelines.

1.1.1. Prescribing

Appropriate prescribing of the medications increases the quality of medical care and decrease the waste of resources. Thus a prescriber should be trained and must have experience in the respective field to comply the guidelines for the management of the disease. If the prescribing adheres to the established STGs, this would also prevent the adverse drug reactions to the patients, providing a safe and effective therapy to them. Prescribing the medications with their generic names is also involved in the promotion to the adherence of the respective prescribers. Prescribing factor also affects the adherence because of lack of knowledge and limited experience in the respective field.(Hogerzeil H V et al,.2000).

1.1.2. Cost

Cost is another important factor that has a potential effect on adherence. If a cost effective medicine is prescribed by the prescriber, it will greatly improve the adherence of patient towards the medication being prescribed leading towards better outcomes. Cost effectiveness can be achieved by prescribing the required medication in generic name so that the patient can switch to other alternatives, if required. Sax P E et al,.2005)

1.1.3. Standard treatment guidelines

The Standard Treatment Guidelines are prepared to assist and guide prescribers, pharmacists, dispensers, and other healthcare staff who prescribe at health care facilities in providing quality care to patients. The guidelines list the preferred treatments for common health problems experienced by people in the health system. These guidelines are used as a guide to provide treatment choices and as a reference book to help in the overall management of the patients (Sharma S et al,. 2009) .Proper use of the STGs in the country can prevent the prescribers to prescribe the wrong medications or wrong doses in the treatment of a particular disease by making drug and its dosage information clear and concise. In addition, they may allow the practitioners to make correct diagnosis of the disease and may bring uniformity in their prescribing trends and beliefs.

1.2. Problem statement

Diabetes mellitus is a disease whose adequate management is decreasing day by day in Pakistan. At state level the weakness and absence of standard treatment guidelines has been found to be an important barrier for implementing rational prescribing of anti-diabetic medications. Limited training and knowledge of the prescribers about the disease as well as the particular drugs majorly effects the rational prescribing and their adherence towards the standard treatment guidelines.Peer influence also greatly affects the prescribing trends and beliefs of the physicians. Influence of the different products by sales promotional officers of the pharmaceutical companies to the prescribers is another hurdle for the better treatment and towards the cost of the particular therapy.

1.3.Rationale of study

Inadequate knowledge, peer influence and lack of use of the standard treatment guidelines by the respective prescribers is leading towards the poor management of diabetes mellitus in our country and specifically in Pakistan, limited work is done for the purpose to evaluate the satisfaction of prescribers of diabetes mellitus to the its standard treatment guidelines, thus this study will give insight to identify the knowledge of the prescribers about the disease as well as the relevant medications. In addition, this study would also determine that

either the standard treatment guidelines are available in the particular health facilities or not, and, if STGs are available, then to how much extent the prescribers follow them in treating the different cases of diabetes mellitus. For this purpose, different prescribers of the tertiary care hospitals including both public as well as private sectors are targeted. In addition to the hospitals, the private clinics of the general physicians are also selected.

1.4. Significance of study

This study is conducted to access the experience and satisfaction of prescribers to the standard treatment guidelines thus it will give a clear idea about the current treatment practices of the prescribers belonging to the tertiary care hospitals and clinics and also that the prescribed treatment regimen is according to the recommended treatment guidelines or not. This study ultimately help our society in different ways by helping policy makers to improve policy with in Pakistan, help doctors to prescribe anti-diabetic medications according to the standard treatment guidelines, thus improving the treatment quality and increase compliance of patients as well. This study will also provide the baseline to improve the rational drug use and cost effectiveness in case of management of diabetes mellitus.

1.5. Study objectives
1.5.1. General objectives

The main objective of this study is to access the satisfaction of prescribers to the standard treatment guidelines of diabetes mellitus.

1.5.2. Specific Objectives

The specific objectives of this study includes:

1. To assess the prescriber's satisfaction regarding standard treatment guidelines.
2. To assess the satisfaction of prescribers regarding the facility they work in.
3. To assess the satisfaction of prescribers regarding patients' compliance to the prescribe treatments.
4. To find the influence of various socio-demographic factors such as experience, sector and occupation on prescriber's satisfaction.

CHAPTER # 02

LITERATURE REVIEW

Diabetes mellitus is a major health problem in the world, thus it requires an appropriate management of the diabetic patients. To manage this disease in a correct way, it is necessary for a prescriber to follow the established standard treatment guidelines, which will not only help the prescriber to provide the best treatment but it will also make the diabetic patient easy to manage and making the cost of therapy to be economic for the patients. There are many studies which have been conducted in the developed countries, developing countries as well as in Pakistan on diabetes mellitus regarding the safe and effective use of drugs, but less attention is given towards the adherence of prescribers to the standard treatment guidelines of this disease (Hussar D A et al,.2009).

2.1. Scenario in developed countries

The management of diabetes mellitus is still a difficult job since variety of the anti-diabetic agents are available. Prescribing adequate medication according to the individual patient condition results in better outcomes and control of the disease. A study was conducted in United States Of America, stated that, the physicians consider variety of qualitative and quantitative factors when making medication choices for management of diabetes mellitus type 2. The complexity in making the choice of anti-diabetic medication contrasts with current treatment guidelines.(Grant R W et al,.2014)The proper management of diabetes mellitus in the primary care settings by appropriate prescribing and use of pharmacological therapy can result in reduced complications and improved economic outcomes, however, such type of management is often difficult to achieve. A study was conducted in United states of America, concluded that, Vermont diabetes information system (VDIS) is well accepted by diabetic patients and health care providers in the primary settings and if it is proved beneficial in a randomized and controlled evaluation, the intervention could be widely disseminated to practices across America and the world with a substantial impact on the outcomes and costs of diabetes. (Maclean C D et al,.2000) Adherence by the prescribers to the guidelines available in the hospitals can reduce the diabetes associated complications in the patients, however, lack of adherence to treatment guidelines for diabetes care leads to adverse health outcomes for the

patients. A study was conducted which reported that, continuous analysis of the prescribing practices is needed to determine the effectiveness of standardized guidelines for the care of patients with diabetes, and less hospitalizations are recorded in the hospitals the prescribers of which show compliance towards the available standard guidelines (Sloan F A et al,.2018). There have been numerous interventions which are reported to be designed for improving the care of patients with diabetes, but the effectiveness of such interventions is doubtful. A study was conducted, which stated that most of the quality improvement strategies produced small to moderate improvements in control of diabetes mellitus. Case management in proper way showed more robust improvements, especially for interventions in which case managers could adjust the doses of required medications without waiting for physician's approval (Shojania K G et a,.2000).Proper identification of patients with poor diabetes control and the reasons why prescribers fail to intensify therapy in these patients is very important point to be focused. A study was conducted in urban African-Americans, stated that, providers in a diabetic clinic appropriately classified patients of diabetes according to their severity level and tended to intensify anti-diabetic therapy in most poorly controlled diabetic patients, when necessary. Provider self-survey of behavior and decision making may be an effective strategy to improve adherence to management protocols (Zeimer D et al,.2001). Computerized reminder systems have been shown to be effective in improving the adherence of prescribers with preventive services guidelines. Limited data has been published about the use of computerized reminders for preventive care in diabetes. A study was conducted in United States Of America, concluded that, computerized reminder systems improves more adherence of prescribers with recommended care by facilitating the documentation of clinical findings and the ordering of recommended procedures for the appropriate management of diabetes as compared to providing the prescriber with patient-specific information about guideline compliance status (Lincoln M J et al,.2010).Less attention has been given towards the pharmaceutical care regarding the best outcomes in the management of diabetes mellitus. A research study was stated that, the management of diabetes mellitus was effective in improving the clinical conditions of enrolled diabetic patients. In addition, significant improvements were observed in LDL values as well as the frequency of adherence to diabetes preventive care in USA (Kiel P et al,.2014). Type 2 diabetes mellitus involves impaired insulin secretion and reduced peripheral insulin sensitivity.

Treatment options include diet, oral anti-diabetic agents and insulin, if necessary. Metformin is one of the oral anti-diabetic agent used to control the blood sugar level. It is an oral biguanide which works by improving peripheral sensitivity to insulin, and reducing gastrointestinal glucose absorption and hepatic glucose production. A study was conducted in UK, reported that, metformin is safe and effective both as monotherapy or in combination therapy with other anti-diabetic agents in type 2 diabetic patients requiring additional diabetes control, and may be beneficial when weight control is desirable (Davidson M et al,.2009).The study was conducted in Netherlands, stated that, Among insured diabetic patients with elevated A1C, level of medication adherence in patients with elevated A1C provided subsequent medication intensification. Poor patient self-management behavior increases the risk of increased blood glucose level (Grant R et al,.2017). Despite the availability of effective oral anti-diabetic agents, control over diabetes mellitus type 2 is still completely not achievable. One of the major factor involved is non-adherence shown by the patients on the prescribed therapy. A study was conducted in United States of America, concluded that, both non-adherence and lack of treatment intensification occur frequently in patients leading to poor control on the disease (Schmittdiel J et al,.2000).The problem of poor adherence by patients of diabetes mellitus to prescribed pharmacological treatments is very complex. Health professionals are rarely being asked how they handle the patient's poor adherence towards the medicines being prescribed. A study was conducted in Belgium. Reported that, physicians dealing with diabetes identified a lot of problems with adherence of patients and suggested many solutions to improve it, but still, they need communication skills to cope with patients expectations to improve diabetes care (Wens J et al,.2009). A study was conducted in United States of America, stated that, adherence towards medication for type 2 diabetes is strongly associated with metabolic control in an indigent population; African-Americans showed lower adherence and worse metabolic control. Thus greater efforts are required to facilitate diabetes self-management behaviors of low-income populations (Schectman J et al,.2009). Adherence to the guidelines is not only important for tertiary health care providers, but it is as equally important for rural health care providers in order to provide better outcomes of patients encountered by them. A study was conducted in America which reported that the rural health care practitioners are not properly following the American diabetes association standards for appropriate management of their patients with

diabetes because HbA$_{1c}$ values indicate that patients do not have their diabetes under optimal control. In addition, the co-morbid conditions of hyperlipidemia and hypertension are not optimally managed according to the guidelines of American diabetes association (Coon P et al,.2009). A study was conducted in England which stated that, the glycemic effect of metformin is similar in both non-obese and obese patients, providing that an individual's body mass index should not influence the choice of oral agent (Donnelly L et al,.2009).

2.2. Scenario in developing countries

Rates of adherence towards diabetes treatment guidelines are low especially in busy primary health care facilities, lacking in computerizes tracking systems. In addition, it is difficult to achieve improved management of diabetic patients using traditional physician's approaches (Kirkman M et al,.2018).Adherence to clinical guidelines not only improves health care outcomes, but also reduces cost of therapy and prevents the complication of unnecessary interventions. It is uncertain how adherence to guidelines for treating diabetes effects on patient satisfaction. A study was conducted in Mexico which reported that, patients who report being treated in accordance with the recommended diabetes guidelines were more likely to be satisfied with their care. This finding may encourage primary care physicians to adequately adhere to current available guidelines (Grossa R et al,.2018).A study was conducted in Srilanka stated that, still there are major dissimilarities between current prescribing practices and the recommended treatment laid down in the clinical guidelines. There is a need of discussion on alternative methods for implementation and evaluation of the efficacy of clinical guidelines (Hetlevik I et al,.2000).

2.3. Scenario in Pakistan

Diabetes Mellitus is a growing epidemic disease in Pakistan and the cost of treating diabetes is largely increasing day by day. A study was conducted which reported that the substantial expenditure is incurred by people with diabetes, earlier detection and a reduction in diabetes co-morbidities and complications through improved diabetes care can reduce the overall cost of treatment in Pakistan (Shera A et al,.2000). A study was conducted in Pakistan, stated that, there is need for improvement in the practices of family physicians in treating and

educating diabetic patients. Awareness and education programs are recommended to update the knowledge of family physicians on early detection and management of diabetes mellitus (Naheed T et al,.2007).Diabetes mellitus type 2 is associated with various patterns of hyperlipidemias that predispose patients to macrovascular complications like coronary heart disease. Diabetic hyperlipidemia is an important cause of morbidity. Duration of diabetes is associated with higher incidence of hyperlipidemia. A study was conducted which reported that, diabetes mellitus is associated with marked increase in the risk of coronary heart disease, thus patients should be educated to get checked continuously for any lipid abnormality and if they are found to have any lipid abnormality, then they should properly take the drug therapy to control their blood gucose level and lipids very effectively (Khowaja L et al,.2000).

Another study concluded that most of the study population have no knowledge about diabetes mellitus as well as its associated complications, hence, more emphasis should be given to health education of diabetic patients along with the available pharmacological therapy in Pakistan (Ali M et al,.2003).Despite the high global prevalence of diabetes mellitus, there is not accurate information of knowledge, attitude and practice of physicians available in this case in our part of world. A study was conducted in Pakistan, stated that, the knowledge, attitude, and practice of our physicians were not suitable in the field of treatment and control of diabetes mellitus as well as its associated complications. Educational and training programs with continuous surveillance is essential to improve knowledge, attitude and practice of physicians (Peimani M et al,.2000).

CHAPTER # 03

METHODOLOGY

Diabetes mellitus is one of the component of metabolic syndromes and should be treated as a whole in order to prevent further complications (Ruchalski C et al,.2005). It is a long life disorder and it is very difficult to treat this problem because firstly doctors lack time and secondly the patients with diabetes mellitus are deficient in resources for comprehensive care (Shera A et al.. 2002). To prevent the severe consequences, it is necessary for the health care providers to give attention towards the standard treatment guidelines of diabetes mellitus and follow them in a correct way. In Pakistan, treatment of diabetes is provided at three health care levels .i.e. primary, secondary and tertiary health care centers. However, proper management of diabetes mellitus in Pakistan is still a problem because the prescribers do not have adequate knowledge towards the treatment of diabetes and they do not prefer to rely on the standard treatment guidelines of diabetes mellitus. In addition, peer influence and brand preference of anti-diabetic agents by prescribers also made the problem worse, thus a lot of training program and availability of STGs for reference is required in health care systems of Pakistan to provide better outcomes to diabetic patients.

3.1. Study questions

1. What is the current prescribing pattern of anti-diabetics in health care systems?
2. What are the perceptions of prescribers regarding use to the standard treatment guidelines in management of diabetes mellitus?
3. What are the perceptions of prescribers regarding effectiveness of anti-diabetic agents?
4. What is the knowledge of prescribers regarding appropriate doses of anti-diabetic agents?
5. What are the perceptions of prescribers regarding first line treatment in case of diabetes mellitus?
6. What is the best recommended therapy in case of diabetes mellitus?
7. What is the relationship of occupation, sector, location and experience with adherence towards the STGs of diabetes mellitus?

3.2. Study design

A descriptive cross sectional study was designed to assess the satisfaction of prescribers towards the standard treatment guidelines of diabetes mellitus. Quantitative method was applied for the purpose of data collection.

3.3. Study settings

To conduct the study, Rawalpindi and Islamabad were selected. Rawalpindi is a city in the Pothohar region of Pakistan in Punjab province near Pakistan's capital city of Islamabad. It is the fourth largest city in Pakistan. The total area of the city is approximately 154 square kilometres .It is the military headquarters of the Pakistani Armed Forces. Islamabad is the capital of Pakistan and the tenth largest city in the country. The population of the city is approximately 1.21 million. Islamabad is located in the Pothohar Plateau in the north of the country, within the Islamabad Capital Territory.

3.4. IMPORTANT DEFINITIONS
3.4.1. Standard Treatment Guidelines

STGs may be defined as the guidelines that gives only few salient features of the disease and important diagnostic tests followed by non-pharmacological and pharmacological treatment (Sharma S et al,.2009).

3.4.2. Prescriber

Prescriber is defined as an authorized practitioner of medicine who is graduated from a college of medicine and licenced by the appropriate board (Novak P D et al,.2004).

3.4.3. Tertiary Care Hospital

Tertiary care hospitals are specialized consultative care, where the specialist working in a centre that has personnel and facilities for special treatment. Usually patients are referred by the primary and secondary hospital practitioners to these hospitals (Heritage J et al,.2003).

3.4.4. Clinic

An establishment where patients are admitted shortly and treated by a group of physicians practicing medicine together (Novak P D et al,.2004).

3.5. Study respondents and study source

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 selected. Basic health units, secondary health care centers as well as the diabetic patients are excluded from the study. Prospective data was obtained by direct filling of questionnaire by the prescribers.

3.6. Sampling

First of all a list of diabetic centers was obtained and convenient sampling technique was used to select health care system. Cochran's formula was used to determine the sample size which came to be 351 prescribers.

3.7. Data collection tool

A questionnaire was designed by using internationally validated tool. A designed questionnaire comprises of 30 questions, mainly highlighting three sections. Section one is related to the information regarding demographics of prescribers, while, section two includes the questions regarding management and satisfaction of prescribers regarding type 2 diabetes mellitus. In addition, this section also involves the questions regarding different factors that affect the use of standard treatment guidelines. A scale was computed for every respective section. The content validity was done by focused group discussions with the experts and supervisor. Pilot testing was done on 10% sample size for reliability of the tool.

3.8. Data analysis

After data collection, data was coded and analyzed by SPSS version 16.0. Statistical analysis was done by using Chi- square tests to find out the differences and association among variables. All the data was presented in figures and tabulated forms.

CHAPTER # 04

RESULTS

4.1. Demographics

In the current study, 351 prescribers were from the tertiary care health (table 1) facilities which included 51.3% (n = 180) from the public and 48.7% (n= 171) from the private sector. Regarding the experience of the prescribers, 43.6% (n=153) had the experience of less than one year, 42.7% (n=150) had the experience of 1-5 years, 6.8% (n=24) had the experience of 6-10 years and of more than 10 years as well.

Table 1 Socio-demographic frequencies

Variables	Categories	N (%)
Age	20-30 years	40 (11.4)
	31 – 40 years	196 (55.8)
	41 – 50 years	115 (32.8)
Gender	Male	175 (49.9)
	Female	176 (50.1)
Marital status	Single	179 (51.0)
	Married	166 (47.3)
	Others	6 (1.7)
Income	<50,000/-	99 (28.2)
	>50,000/-	175 (49.9)
	100,000-200,000	70 (19.9)

	>200,000	7 (2.0)
Area of specialization	Medical specialist	161 (45.9)
	Endocrinologist	159 (45.3)
	Others	31 (8.8)
Been practicing medicine	<1 year	155 (44.2)
	1-5 years	134 (38.2)
	6-10 years	49 (14.0)
	>10 years	13 (3.7)

The figure below shows the graphical respresentation of the experoemce the respondents have in diabetes management.
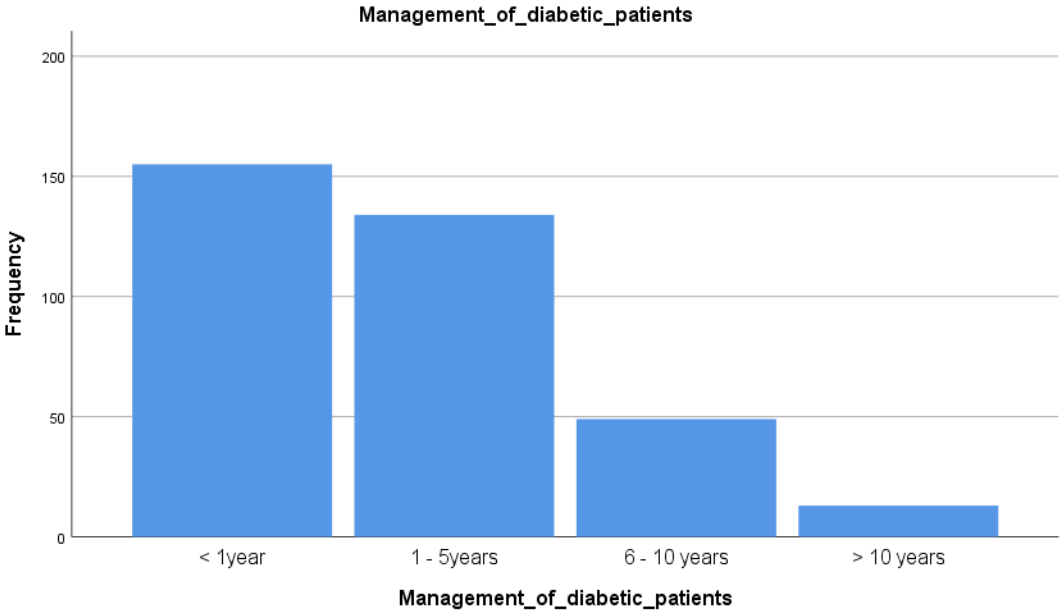

Figure 1Experience of Respondents in Management of Diabetes

4.2. MANAGEMENT OF DIABETES MELLITUS

4.2.1. Prescriber's satisfaction regarding STGs

The results showed that 46.7% (n=164) prescribers agree that the current available drugs in the hospital are effective where as 53.3% (n=187) disagreed with the mentioned statement. Similarly 49.6% (n=174) are not in the opinion to give combination therapy while 50.4% (n=177) agreed that combinational therapy is beneficial. 53.8% (n=189) relates STGs with cost effectiveness positively but 46.2% (n=162) opposed the statement. For the conduction of educational programs in the proper treatment of diabetes mellitus treatment 49% (n=172) disagreed and rest of the prescribers i.e. 51.0% (n=179) agreed the statement (Table 2).

INDICATOR	DISAGREE WITH THE STATEMEMNT		AGREE WITH THE STATEMENT	
	%	N	%	n
Effectiveness of current drugs in hospital.	53.3	187	46.7	164
	49.6	174	50.4	177
Effect of STGs on cost effectiveness.	46.2	162	53.8	189
Educational programs.	49	172	51	179

Table 1 Prescriber's satisfaction regarding STGs

Figure 2 shows the distribution of opinion on whether combination therapy serves as an effective method to manage diabetes

In your opinion, do you think combination therapy is beneficial in the management of diabetic patients?
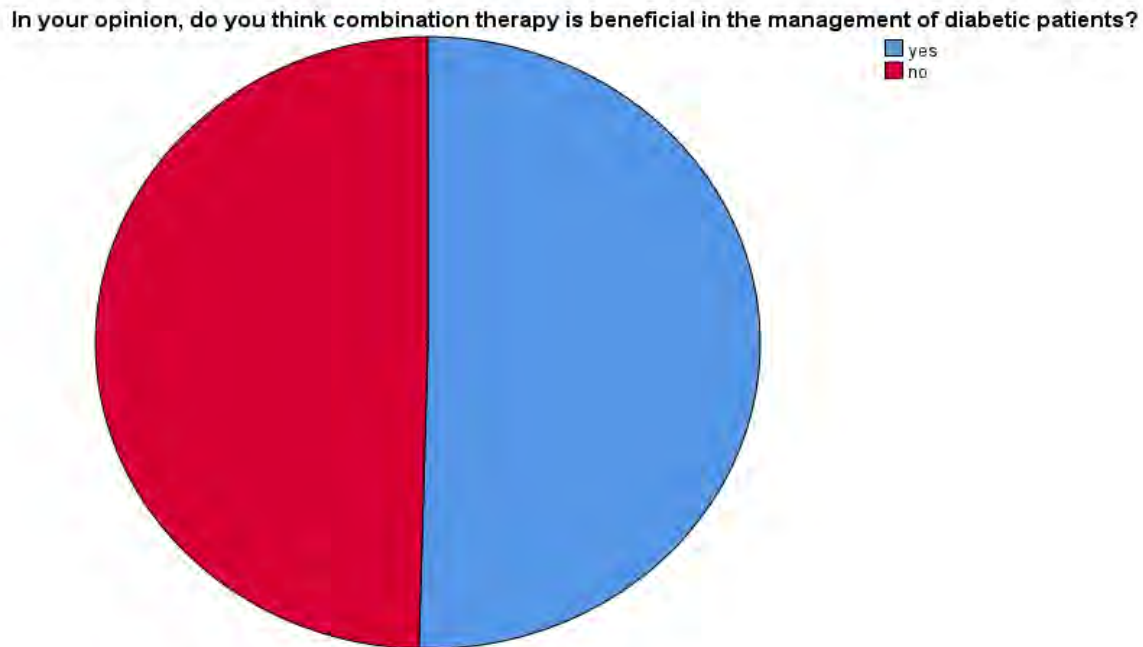
Figure 2 Opinion on Combination Therapy Effectiveness. In pie chart, red color shows the percentage of agreed participants with the statement i.e. 49.6% whereas the blue color shows the percentage of disagreed participants with the statement i.e. 50.4%.

4.2.2. Prescriber's satisfaction regarding facility

Descriptive results show that 49.9% (n=175 practitioners agree that the facility they work in properly manages diabetic medicines (table 2), and 51.6% (n=181) also agree that the patient is able to get their prescribed medicine. While 49% (n=172) practitioners believe that their patients are not satisfied with the treatment they receive.

Table 2Prescriber's satisfaction regarding facility

INDICATOR	DISAGREE WITH THE STATEMEMNT		AGREE WITH THE STATEMENT	
	%	N	%	N
Diabetes is properly managed in facility	50.1	176	49.9	175
Patient gets the prescribed medicine	48.4	170	51.6	181
Patient satisfaction with the treatment	49	172	51	179
Patient informed on how to use medicine	48.7	171	51.3	180

4.2.3. Prescriber's satisfaction regarding patient compliance

Results of the study showed that 49.9% (n=175) of the respondents reported a fear of injection in their patients (table 3), 51% (n=179) reported concern regarding dose complexity in patients, while 38.7% (n=136) believed lack of adherence to be the cause of patients not reaching their target glucose levels.

Table 3 Prescriber's satisfaction regarding patient compliance

INDICATOR	DISAGREE WITH THE STATEMEMNT		AGREE WITH THE STATEMENT	
	%	N	%	n
Fear of injection in patients	50.1	176	49.9	175
Concern regarding dose complexity	49	172	51	179
Patient motivation	49.9	175	50.1	176
Satisfaction regarding patient's medical adherence	44.4	156	55.6	195
Patients prescribed faster	49.9	175	50.1	176

4.3. Inferential Results

4.3.1. Prescriber's satisfaction regarding STGs

The highest satisfaction regarding STGs was found in the 30-40 year age group i-e 58.6% (n=85) while the male respondents made up 54.5% (n=79) of the satisfied prescribers (table 5). The chi-square test of association showed a significant association with age (p-value = 0.038), marital status (p-value=0.039), area of specialization (p-value=0.01), and experience in the field (p-value=0.00).

Table 4 Socio-demographics associated with prescriber's satisfaction regarding STGs

Variables	Categories	Unsatisfied Prescribers N (%)	satisfied Prescribers N (%)	Chi-square	p-value
Age	20-30 years	31 (15)	9 (6.2)	6.617 (2)	**0.037**
	31 – 40 years	111 (53.9)	85 (58.6)		
	41 – 50 years	64 (31.1)	51 (35.2)		
Gender	Male	96 (46.6)	79 (54.5)	2.114 (1)	0.146
	Female	110 (53.4)	66 (45.5)		
Marital status	Single	97 (47.1)	82 (56.6)	6.490 (2)	**0.039**
	Married	103 (50)	63 (43.4)		
	Others	6 (2.9)	0 (0)		
Income	<50,000/-	63 (30.6)	36 (24.8)	2.707 (3)	0.439
	>50,000/-	103 (50)	72 (49.7)		
	100,000-200,000	37 (18)	33 (22.8)		

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	>200,000	3 (1.5)	4 (2.8)		
Area of specialization	Medical specialist	106 (51.5)	55 (37.9)	9.231 (2)	**0.01**
	Endocrinologist	88 (42.7)	71 (49)		
	Others	12 (5.8)	19 (13.1)		
Type of facility	Public	113 (54.9)	67 (46.2)	2.547 (1)	0.11
	Private	93 (45.1)	78 (53.8)		
Been practicing medicine	<1 year	95 (46.1)	58 (40.0)	2.564	0.464
	1-5 years	82 (39.8)	68 (46.9)		
	6-10 years	13 (6.3)	11 (7.6)		
	>10 years	16 (7.8)	8 (5.5)		

4.3.2. Prescriber's Satisfaction Regarding Facility

Females made up 51.9% (n=166) of the total respondents not satisfied with the facility they are working in, while 25.6% (n=82) of those making less than 50,000/- were also not satisfied (table 6). The chi-square test showed significant associations with age (p-value=0.028), gender (p-value=0.037), income (p-value=0.00), and experience (p-value=0.036).

Table 5 Socio-demographics associated with prescriber's satisfaction regarding facility

Variables	Categories	Unsatisfied Prescribers N (%)	satisfied Prescribers N (%)	Chi-square	p-value
Age	20-30 years	33 (10.3)	7 (22.6)	7.129 (2)	**0.028**
	31 – 40 years	185 (57.8)	11 (35.5)		
	41 – 50 years	102 (31.9)	13 (41.9)		
Gender	Male	154 (48.1)	21 (67.7)	4.350 (1)	**0.037**
	Female	166 (51.9)	10 (32.3)		
Marital status	Single	167 (52.2)	12 (38.7)	2.997 (2)	0.224
	Married	147 (45.9)	19 (61.3)		
	Others	6 (1.9)	0 (0)		
Income	<50,000/-	82 (25.6)	17 (54.8)	26.807 (3)	**0.00**
	>50,000/-	164 (51.2)	11 (35.5)		
	100,000-200,000	70 (21.9)	0 (0)		
	>200,000	4 (1.3)	3 (9.7)		
Area of specialization	Medical specialist	148 (46.3)	13 (41.9)	4.341 (2)	0.114
	Endocrinologist	141 (44.1)	18 (58.1)		
	Others	31 (9.7)	0 (0)		

Type of facility	Public	164 (51.2)	16 (51.6)	0.001 (1)	1.00
	Private	156 (48.8)	15 (48.4)		
Been practicing medicine	<1 year	142 (44.4)	11 (35.5)	2.748 (3)	**0.036**
	1-5 years	137 (42.8)	13 (41.9)		
	6-10 years	21 (6.6)	3 (9.7)		
	>10 years	20 (6.3)	4 (12.9)		

4.3.3. Prescriber's Satisfaction Regarding Patient Compliance

The highest satisfaction percentage was found in the 30-40 years age group i-e 63.6% (n=14), 50% (n=11) of the satisfied prescribers were medical specialists (table 7). Chi-square test showed association of compliance satisfaction to be significant with income (p-value=0.00), type of working facility (p-value=0.02), and experience in diabetes management (p-value=0.03).

Table 6 Socio-demographics associated with prescriber's satisfaction regarding patient compliance

Variables	Categories	Unsatisfied Prescribers N (%)	satisfied Prescribers N (%)	Chi-square	p-value
Age	20-30 years	40 (12.2)	0 (0)	3.023 (2)	0.22
	31 – 40 years	182 (55.3)	14 (63.6)		
	41 – 50 years	107 (32.5)	8 (36.4)		
Gender	Male	164 (49.8)	11 (50.0)	0.000 (1)	0.98
	Female	165 (50.2)	11 (50.2)		

Marital status	Single	165 (50.2)	14 (63.6)	1.729 (2)	0.42
	Married	158 (48)	8 (36.4)		
	Others	6 (1.8)	0 (0)		
Income	<50,000/-	99 (30.1)	0 (0)	23.605 (3)	**0.00**
	>50,000/-	153 (46.5)	22 (100)		
	100,000-200,000	70 (21.3)	0 (0)		
	>200,000	7 (2.1)	0 (0)		
Area of specialization	Medical specialist	150 (45.6)	11 (50.0)	3.352 (2)	0.16
	Endocrinologist	152 (46.2)	7 (31.8)		
	Others	27 (8.2)	4 (18.2)		
Type of facility	Public	174 (52.9)	6 (27.3)	5.416 (1)	**0.02**
	Private	155 (47.1)	72.7 (22)		
Been practicing medicine	<1 year	146 (44.4)	7 (31.8)	7.058 (3)	0.06
	1-5 years	139 (42.2)	11 (50)		
	6-10 years	24 (7.3)	0 (0)		
	>10 years	20 (6.1)	4 (18.2)		

DISCUSSION

5.1. Discussion

Rational drug prescribing by the physicians can be ensured by implementing standard Treatment Guidelines to different levels of health care facilities in the country. Use of standard treatment guidelines is important as it promotes the rational drug use. But unfortunately the results of current study revealed the lack of use of standard treatment guidelines in case of diabetes mellitus type 2. Physicians who manage type 2 diabetes mellitus have different views about effectiveness of individual anti-diabetic agent and combinational therapy. Many physicians think that switching from one anti-diabetic medicine to another is a better option, while, some physicians contradict this approach because according to them combination therapy is most effective when single agent cannot manage the severity of diabetes mellitus. The results of current study highlighted that combination therapy has a more pronounced effect in managing the diabetic patients, while switching from one individual drug to another single agent in management of diabetes mellitus is also witnessed. This can be the best alternative for the physicians to prescribe drugs with best effects. A study in USA, indicated that combination therapy was more preferred than mono therapy (Austin R A et al,.2007). In the management of Diabetes mellitus 2 most of the physicians said that the medicines being prescribed are effective and believed that more educational programs should be organized in order to generate awareness in the society. Physicians also showed a positive response toward the use of STGs in daily practice in the management of the disease. In order to rationalize the practice, guidelines must be implemented that can assure the rationality of the prescribing practice. A study highlighted that lack of interest of the regulatory authorities as a major factor for the mismanagement of diabetes mellitus type 2 (Sloan F A et al,.2000). Patients and physicians knowledge on the disease also help in the management of diabetes mellitus. If the patient is not aware of the disease condition obviously it will lead to health complications. Similarly physicians experience also benefit in term of knowledge on the disease. The results of current study highlighted that adequate knowledge and experience of physicians on the respective disease can result in the proper management of the patient. Similar study conducted on the use of the guidelines indicated that the health facilities which show adherence to guidelines showed

pronounced effect on patients health (Kamyar M et al,.2001). Anti-diabetic agents availability in the hospital formulary is beneficial to treat the patient appropriately and the present study revealed that the presence of anti-diabetic agents in targeted health care facilities are adequate. The results of the study revealed that the anti-diabetic agents were present in the hospital formulary and were prescribed by the physicians (Shankar R et al,.2007).The current study also highlighted that some of the physicians rely on verbal counseling, whereas most of the physicians rely on both verbal and diet charts in order to ensure compliance to the treatment. Similar practices were reported in a study conducted in India showed that, balanced diet plans given by prescribers/pharmacist to treat diabetic patients proved helpful in increasing compliance of diabetic patient (Mehta D et al,.2002). The results of present study highlighted a significant difference in the knowledge of prescribers regarding the dose of anti-diabetic agents among public and private sectors. The results concluded that it might be due to inadequate knowledge on the respected disease (Janjua Z et al,.2007).

5.2. Limitations

Time and financial constrains were the major limitations of the study. Physicians were also a hurdle in this study as they were reluctant to share their views on standard treatment guidelines.

5.3. Recommendations

The study revealed that a maximum number of physicians does not follow standard treatment guidelines on diabetes mellitus which ultimately cost the patient health. Standard treatment guidelines must be designed on national level and must be implemented in every health care facility by the regulatory authority and the diabetic association. Work should be done on proper follow up.

5.4. Conclusion

The study concluded that diabetes mellitus type 2 is not been properly managed in the country. There are many reasons for that. The issue highlighted in this study was lack of use of standard treatment guidelines on diabetes mellitus type 2. It was finally concluded that in current practice no standard treatment guidelines are been followed by health care providers to manage a diabetic patient. Inadequate knowledge regarding standard treatment guidelines in type 2 diabetes mellitus was major problem of the present date.

5.5 Directions for future work

Work should be done on the quality of knowledge by the physicans and the patients on diabetes mellitus type 2. Proper use of standard treatment guidelines must be ensured as an active part of practice by the physicians. Diabetic associations can play a vital role in implementation of guidelines. Work must be done on diet modification for the diabetes mellitus type 2 patients.

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APPENDIX A

CONSENT FORM

I am Nida Nasir, student of MSPH- Final Semester, Alshifa School of Public Health, Alshifa Eye Hospital, Rawalpindi. I am doing research on "Prescribers experience and satisfaction regarding standard treatment guidelines in diabetes mellitus 2".

PURPOSE OF THE RESEARCH

The purpose of this study is to assess the **prescriber experience and satisfaction regarding standard treatment guidelines in diabetes mellitus 2**

I do not anticipate that taking this study will contain any risk or inconvenience to you. Your participation is strictly voluntary and you may withdraw your participation at any time without penalty. I request you to answer the questions as honestly as possible. It will take no longer than 15 minutes to complete a questionnaire. All information collected will be used only for research purpose and will be kept highly confidential. Your identity and your responses will not be identifiable; all data will be stored anonymously. As this is solely a student project no incentive will be provided. Once study is completed, I would be happy to share the results with you if you desire.

Thank you for agreeing to participate in this study. Your feedback is important.

Consent

I have read and understand the information sheet and agree to take part in the study.

Signature_____ **Date**_____

(Questionnaire)

Prescriber's experience and satisfaction regarding standard treatment guidelines for the diabetes mellitus type 2 in Rawalpindi and Islamabad

A. **Demographics**
1. Age _____
2. Gender _____
3. Marital status
a. Single b. Married c. others
b. Income
   a. < 50,000
   b. > 50,000
   c. 100,000 -200,000
   d. >200,000
c. Area of specialization
   a. Medical specialist
   b. Endocrinologist
   c. Others
4. Working experience _____
5. Working experience in diabetic management _____
6. Training on DM if Any _____
7. Type of working facility
   a. Public b. Private
8. Daily working hours _____
9. Daily OPD of DM patients _____ -

10. How long have you been practicing in medicine?

11.   a) < 1year   ☐ b) 1 – 5 years   ☐ c) 6-10 years   ☐ d) >10 years

12. How many years have you been involved in the **management of diabetic patients**?

13. ☐a) < 1year   ☐b) 1 – 5 years   ☐c) 6-10 years   ☐ d) >10 year

B. Prescribers satisfaction regarding STGs

1. Diabetes in patients is well controlled with current available anti-diabetic agents in the hospital. What is your opinion on the statement?

     a.   Yes   b. No

2. Guidelines on management on diabetes mellitus are available in the Hospital.

     a) Yes, please specify_____

     b) No

     c) Not sure

3. In your opinion, do you think combination therapy is beneficial in the management of diabetic patients?

     a.   Yes   b. No

4. Do you agree that prescribing anti-diabetic agents for diabetes mellitus is according to the guidelines are cost effective?

     a) Yes   b) No

5. In your opinion, there is a need for more educational programs to increase knowledge & awareness on the available guidelines?

      a) Yes   b) No

C. Prescriber satisfaction regarding facility

1. Do you agree that diabetic medicines are properly managed with in the fascility

    a) Yes   b) No

2. Does the patient gets the medicine you prescribe?

    a) Yes   b) No

3. Does your patients are satisfied by the treatment they received in the pharmacy?

    a) Yes   b) No

4. Does they are properly informed how to use the medicine?

    a) Yes   b) No

D. Prescriber satisfaction patient compliance

1. How often do you see your patients fear of injection?

    a) Yes   b) No

2. How often you see patient concern regarding complexity of doses?

    A) Yes   b) No

3. Based on your experience, how motivated are patients to reach their target blood glucose levels?

    a) Yes   b) No

4. Are you satisfaied regarding patient adherence to the medicines?

    a) Yes   b) No

5. In most cases, are patients prescribed faster as part at the same visit when introduced to faster as part treatment option?

    a) Yes   b) No

6. What do you believe are the reasons for not reaching their target level?

a) Lack of adherence b) difficulty with the device c) difficulty with dose adjustment e) others

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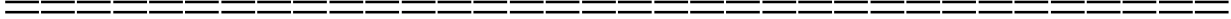
APPENDIX C

IRB LETTER

AL-SHIFA SCHOOL OF PUBLIC HEALTH
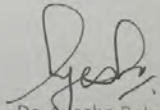PAKISTAN INSTITUTE OF OPHTHALMOLOGY
AL-SHIFA TRUST, RAWALPINDI

No. MSPH-IRB/13-28
24th March, 2022

TO WHOM IT MAY CONCERN

This is to certify that Nida Nasir D/O Nasir Majeed is a student of Master of Science in Public Health (MSPH) final semester at Al-Shifa School of Public Health, PIO, Al-Shifa Trust Rawalpindi. He/she has to conduct a research project as part of curriculum & compulsory requirement for the award of degree by the Quaid-i-Azam University, Islamabad. His/her research topic which has already been approved by the Institutional Review Board (IRB) is "Prescriber's experience and satisfaction regarding standard treatment guidelines for the diabetes mellitus type 2 in Rawalpindi".

Please provide his/her necessary help and support in completion of the research project. Thank you.

Sincerely,

Dr. Ayesha Babar Kawish
Head
School of Public Health, PIO
Al-Shifa Trust, Rawalpindi

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APPENDIX D

BUDGET

Budget item	Transport	Stationary and internet	Printing	Publishing
Pilot testing	500 Rs/-	6000 Rs/-	4000 Rs/-	-
Data collection	12000 Rs/-	8000 Rs/-	-	-
Thesis write up	1000 Rs/-	9000 Rs/-	6000 Rs/-	25000 Rs/-
Total expenditure	13,000 Rs/-	23,000 Rs/-	10,000 Rs/-	25,000 Rs/-

Grand Total : 71,500 Rs/-