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EVALUATION OF AWARENESS AMONG PATIENTS SUFFERING FROM DIABETES MELLITUS AND ITS MANGEMENT

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Abstract:
Objective: To evaluate the awareness among diabetic patients regarding their disease and its management in 5 districts of Punjab, Pakistan.
Design: Study conducted at medical OPDs of DHQs and secondary level hospitals in the private sector from august to September 2017.
Method: All considered patients who were visiting there hospitals were approached and a questionnaire was being filled by them consisting of questions regarding the awareness and management of diabetes mellitus and its complications.
Results: 100 patients were evaluated, out of which 36% were male and 64% were female.3% patients were below 25 years of age, 13% were in the range of 25-40 years, 61% were in the range of 41-60 years and 23% patients were above 60 years of age.6% of the patients suffered from type I diabetes and 94% from type II diabetes.20% of the patients had associated eye complains while 18% had an associated nerve disorder. In 13% of the patients associated nephropathy had been observed. Percentage of patients who had their own glucose testing device in the private sector is 58% while only 18% in the government sector. It has also been evaluated that in the private sector 86% of the patients had an idea about hypoglycemia and its management, 78% of patients had an idea about importance of diet control and 76% had an idea about importance of exercise in the management of diabetes mellitus whereas in the government sector 72% of the patients had an idea about hypoglycemia and its management, 66% of patients had an idea about importance of diet control and 32% had an idea about importance of exercise in the management of diabetes mellitus.
Conclusion: Awareness of diabetes mellitus and its management in our community needs to be improved. Overall percentage of awareness that has been calculated depicts that awareness in the private sector is comparatively better than government sector (63.3 and 40.03% respectively).
Key words: *Diabetes mellitus, complications, awareness, glucose testing, diet control and exercise, hypoglycemia.*

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INTRODUCTION:

i) Definition:

In 1999, WHO defined diabetes mellitus as "a metabolic disorder of multiple etiology, characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both". The effects of diabetes mellitus include long-term damage, dysfunction and failure of various organs [4]. Thus, the metabolic abnormalities of diabetes result from inadequate insulin action on target tissues, due to deficient insulin secretion or insensitivity to insulin action, or a combination of both. [2, 5]

ii) Diagnosis:

The diagnosis of diabetes in an asymptomatic individual should never be made on the basis of a single abnormal glucose value. Verification of the diagnosis with repeat testing is required, unless an individual presents with unequivocal hyperglycemia along with its classic symptoms. The diagnostic values for diabetes mellitus and other categories of hyperglycemia are shown in table 1. [4]
Using fasting plasma glucose may not be equivalent to or as accurate as the use of an oral glucose tolerance test (OGTT) in identifying individuals with diabetes.

iii) Classification:

The classification of diabetes mellitus has evolved considerably over time, taking into account recent advances in the diabetes field. The classification is now primarily based on the etiology (causes) of the disease, rather than its treatment. The clinical staging reflects that diabetes mellitus, regardless of its etiology, progresses through several clinical stages during its natural history. Individuals can move from one stage to another in either direction [4]. The severity of glycaemia may change over time depending on the extent of the underlying disease processes. While there are autoimmune markers that help identify type 1 diabetes mellitus, there are few sensitive or highly specific indicators of the type 2 process at present, although these are likely to be revealed in the future. In some individuals with type 2 diabetes, adequate glycemic control can be achieved with weight reduction, exercise and/or oral agents. These individuals, therefore, do not require insulin and may even revert to IGT or normoglycaemia. Other individuals require insulin for adequate glycaaemic control but can survive without it. These individuals, by definition, have some residual insulin secretion. Individuals with extensive beta-cell destruction, and therefore no residual insulin secretion, require insulin for survival.

The severity of the metabolic abnormality can even regress (e.g. with weight reduction), progress (e.g. with weight gain), or stay the same [4].

iv) Terminology:

There are two main types of diabetes:
Type 1 (requiring insulin for survival) and
Type 2 (may or may not require insulin for metabolic control).

It is recommended that the terms insulin-dependent diabetes mellitus and non-insulin-dependent diabetes mellitus, and their acronyms IDDM and NIDDM, no longer be used. These terms are confusing and frequently result in patients being classified on the basis of treatment rather than etiology.
Type 1 diabetes mellitus encompasses the majority of cases, which are primarily due to pancreatic islet s-cell destruction and are prone to ketoacidosis. Type 1 includes those cases attributable to an autoimmune process, as well as those with s-cell destruction for which neither etiology nor pathogenesis is known (idiopathic). It does not include those forms of s-cell destruction or failure to which specific causes can be assigned (e.g. cystic fibrosis, mitochondrial defect, etc.) [1, 2, 4, 6] .

Type 2 includes the common major form of diabetes mellitus which results from defect(s) in insulin secretion, almost always with a major contribution from insulin resistance.
Impaired glucose regulation IGT and/or impaired fasting glycaemia (IFG) refer to a stage that is intermediate between normoglycemia and diabetes and they represent risk categories for future development of diabetes mellitus [4, 6]. The risk of diabetes is increased in persons with IGT. In addition, the prevalence of electrocardiogram (ECG) abnormalities is significantly higher in persons with IGT compared to persons with normal glucose tolerance, and cardiovascular mortality is higher. IGT and IFG are not clinical entities in their own right, but rather risk categories for future diabetes and/or cardiovascular disease. They can occur as an intermediate stage in any of the disease processes. IGT is often associated with the metabolic syndrome (insulin resistance syndrome). IGT may not be directly involved in the pathogenesis of cardiovascular disease, but rather may serve as an indicator or marker of enhanced risk by virtue of its correlation with the other elements of the metabolic syndrome. Self-evidently, those individuals with IGT manifest glucose intolerance only when challenged with an oral glucose load.

Normoglycaemia:
A fasting venous plasma glucose concentration of <6.1 mmol/litr (110 mg/dl) has been chosen as "normal". Although this choice is arbitrary, such values have been observed in people with proven normal glucose tolerance; however, others with fasting glucose values <6.1 mmol/litr may have IGT if an OGTT is performed. Fasting glucose values above this level are associated with a progressively greater risk of developing micro vascular and macro vascular complications.

MATERIAL AND METHOD:

Objective: To evaluate the awareness among diabetic patients regarding their disease and its management in 5 districts of Punjab, Pakistan.

Design: Study conducted at medical OPDs of DHQs and secondary level hospitals in the private sector from august to September 2017.

Method: All considered patients who were visiting there hospitals were approached and a questionnaire was being filled by them consisting of questions regarding the awareness and management of diabetes mellitus and its complications.

RESULTS:
Total 100 patients were included in the study, 20 from each district, in which 36 % were males and 64 % were females. Their ages ranged between 41-60 years. From educational aspect majority of patients were above primary. Sex, age distribution and qualification are presented in table 1.

Table no. 1

Factors	Gujranwala	Sialkot	Attock	Rawalpindi	Sargodha	Total %age
Male	50%	45%	30%	25%	30%	36%`
Female	50%	55%	70%	75%	70%	64%
<25 years	5%	5%	0%	5%	0%	3%
25-40 years	20%	15%	0%	0%	30%	13%
41-60 years	65%	60%	70%	50%	60%	61%
>60 years	10%	20%	30%	45%	10%	23%
Below primary	30%	40%	35%	35%	30%	34%
Above primary	70%	60%	65%	65%	70%	66%
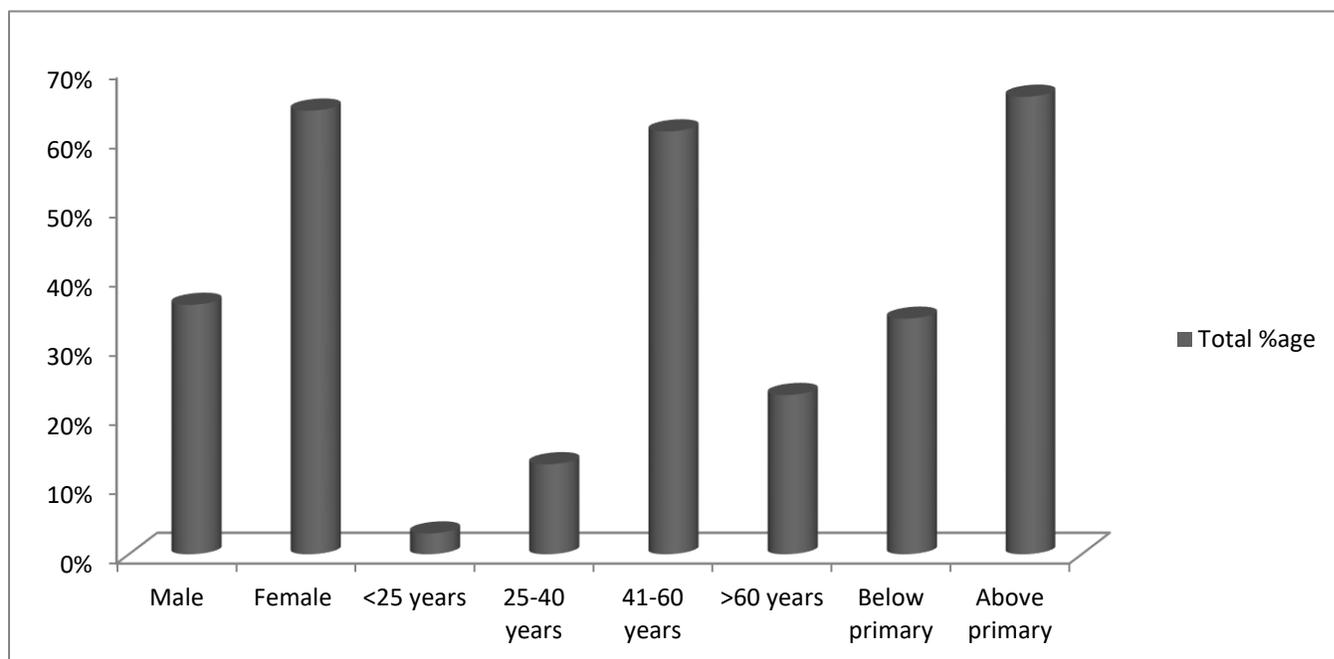
While the pattern of diabetes is presented in table 2

Table no. 2

Types	Gujranwala	Sialkot	Attock	Rawalpindi	Sargodha	Total %age
Type I diabetes mellitus	5%	5%	0%	15%	5%	6%
Type II diabetes mellitus	95%	95%	100%	85%	95%	94%
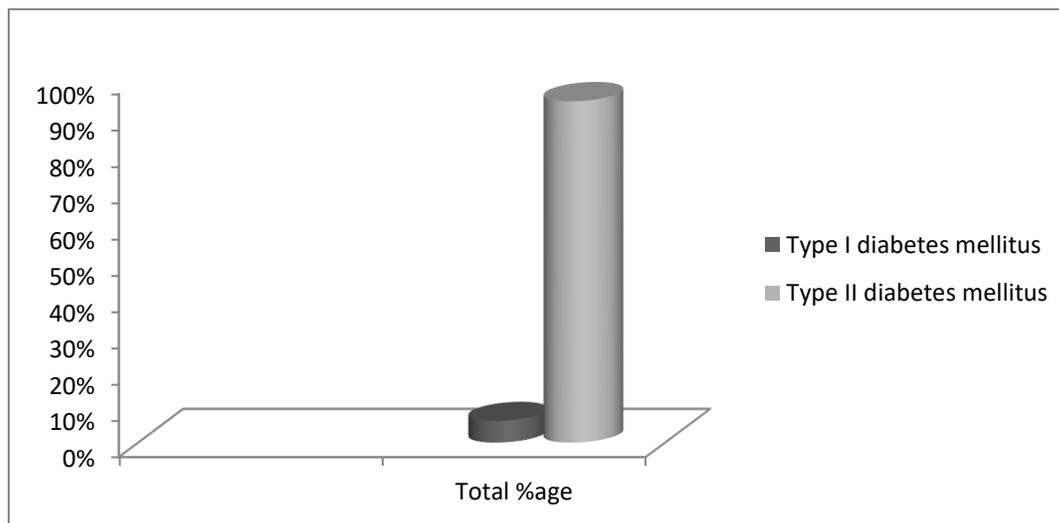
42% of patients were satisfied with their general health and 58% were not satisfied. Pain level associated with any nerve disorder (diabetic complication) was assessed as shown in table 3. Moreover the patients were asked about micro vascular and macro vascular complications of diabetes mellitus. Also family history of diabetes mellitus was observed in 62% of patients.

Table no. 3

Factors	Gujranwala	Sialkot	Attock	Rawalpindi	Sargodha	Total %age
Satisfied with general health	15%	55%	50%	45%	45%	42%
Not satisfied with general health	85%	45%	50%	55%	55%	58%
No pain	5%	0%	5%	0%	0%	4%
Mild pain	10%	20%	40%	40%	15%	23%
Moderate pain	40%	30%	35%	45%	45%	39%
Severe pain	45%	50%	20%	15%	40%	34%
Other complications like high B.P. ,	45%	45%	20%	35%	25%	34%
Eye complains,	35%	30%	0%	25%	10%	20%
Nerve disorder,	5%	55%	5%	25%	0%	18%
Heart disease,	20%	15%	10%	20%	0%	13%
Kidney disease	25%	15%	0%	10%	15%	13%
Family history	75%	65%	45%	60%	65%	62%
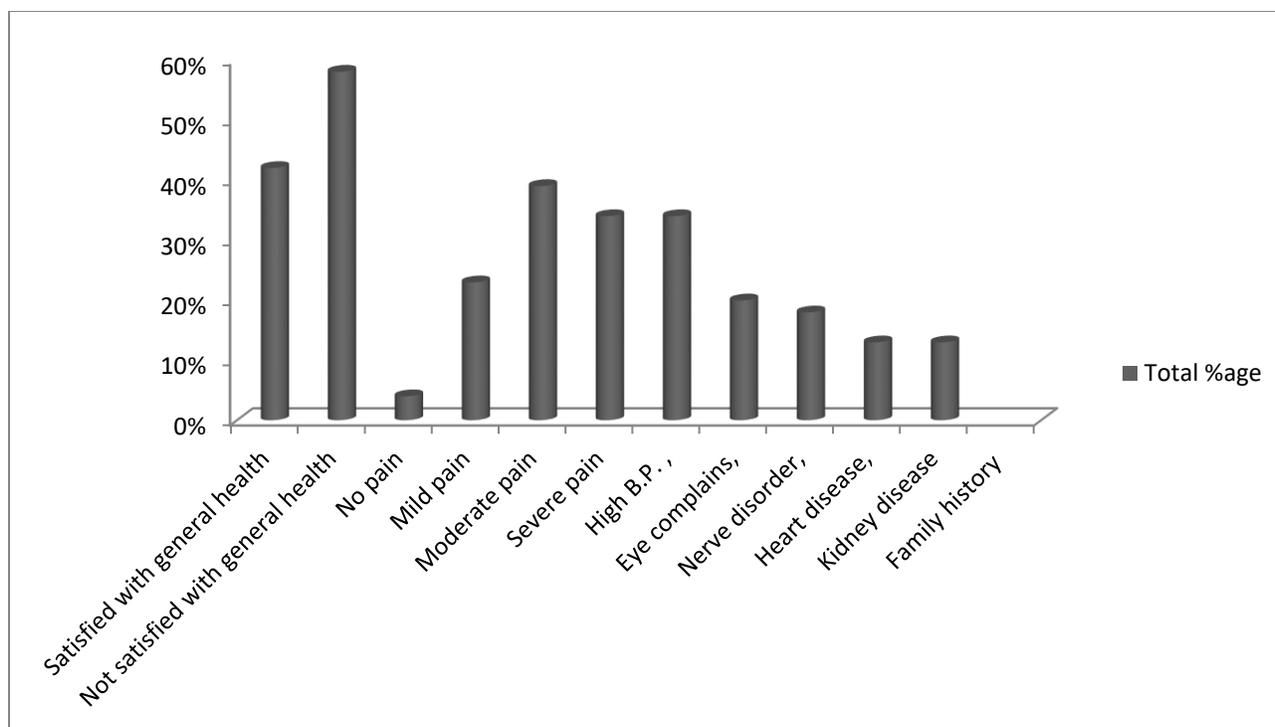
Awareness of patients regarding their disease was evaluated in each district by asking different questions as shown in questionnaire. For this purpose patients who were visiting government and private hospitals were approached separately. In private sector 58 % of patients have their own glucometer and in government sector 18 % of patients have their own glucometer. Frequency of measurement of blood sugar level was evaluated both at government and private sector by asking them how many days in the previous week they had tested their blood sugar level and how many times on average in one day as shown in table 4.

Table no. 4

Evaluated factors	Gujranwala		Sialkot		Attock		Rawalpindi		Sargodha	
	Govt.	Private	Govt.	Private	Govt.	Private	Govt.	Private	Govt.	Private
Own glucometer	30%	80%	30%	50%	10%	40%	0%	100%	20%	20%
Zero times in last week	80%	10%	30%	50%	60%	10%	100%	20%	50%	70%
Once in last week	10%	0%	20%	20%	40%	40%	0%	20%	20%	20%
Twice in last week	10%	30%	20%	0%	0%	20%	0%	0%	30%	10%
Thrice in last week	0%	20%	20%	10%	0%	30%	0%	30%	0%	0%
More than 3 times in a week	0%	40%	10%	20%	0%	0%	0%	30%	0%	0%
Once in a day	20%	80%	70%	50%	40%	60%	0%	70%	50%	30%
Twice in a day	0%	10%	0%	0%	0%	30%	0%	30%	0%	0%
Thrice in a day	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
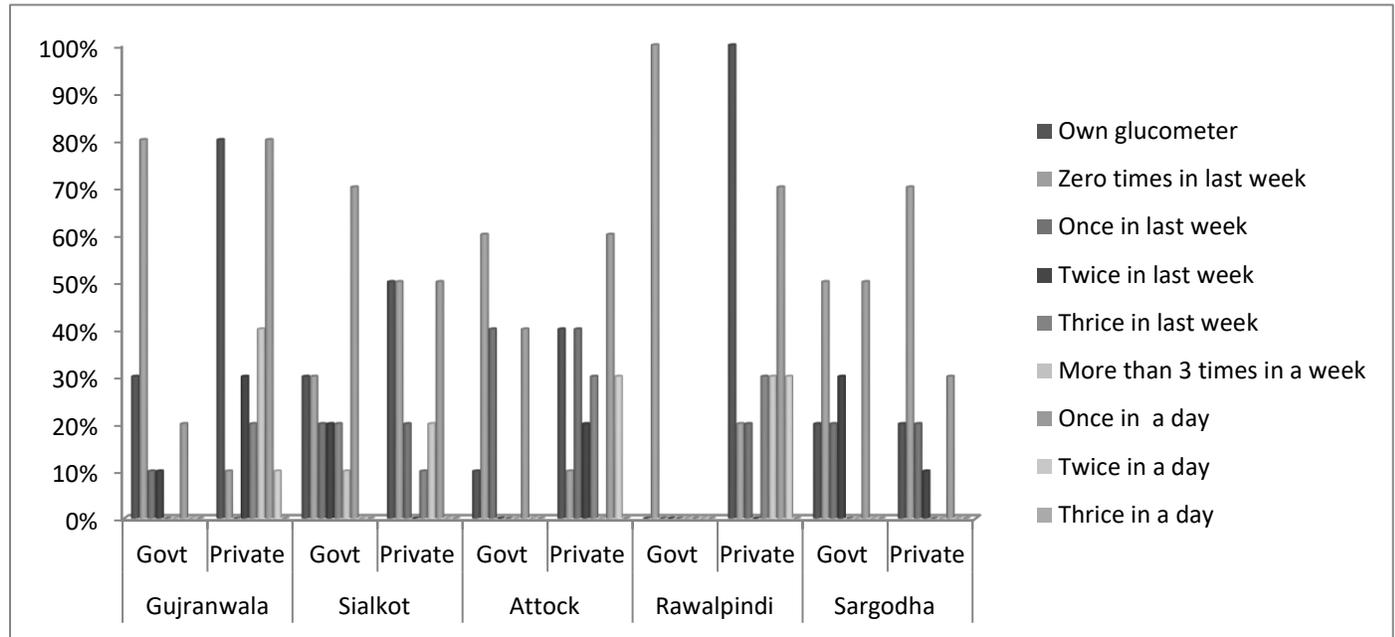
In private sector 12% of patients were on insulin therapy alone and 20% of patients were using insulin along with oral hypoglycemic. 42% of patients were using single oral hypoglycemic and 18% of patients were using oral hypoglycemic in combination. Similarly in government sector 26% of patients were on insulin therapy alone and 12% of patients were using insulin along with oral hypoglycemic. 42% of patients were using single oral hypoglycemic and 20% of patients were using oral hypoglycemic in combination. All these figures are shown in table 5.

Table no. 5

Evaluated factors	Gujranwala		Sialkot		Attock		Rawalpindi		Sargodha	
	Govt.	Private	Govt.	Private	Govt.	Private	Govt.	Private	Govt.	Private
Insulin alone	60%	10%	30%	0%	10%	10%	10%	20%	20%	20%
Insulin + oral hypoglycemic	30%	40%	30%	30%	0%	0%	0%	0%	0%	30%
Single oral hypoglycemic	0%	40%	20%	20%	80%	70%	50%	30%	60%	50%
Combination of oral hypoglycemic	10%	0%	20%	50%	10%	20%	40%	20%	20%	0%
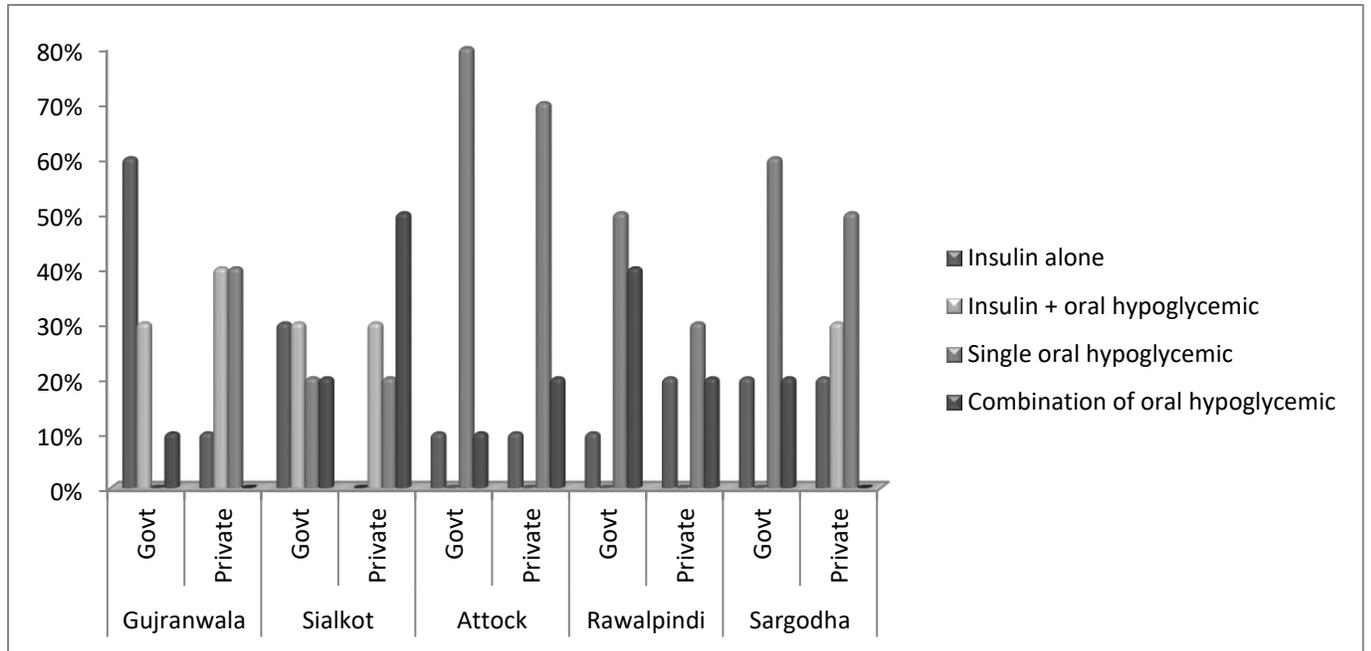
Also in private sector only 90 % of patients knew that either their medication had changed during last five years or not. 66 % of patients brought their previous prescriptions along when they come for checkup and in government sector only 64.6 % of patients knew that either their medication had changed during last five years or not. 32% of patients brought their previous prescriptions along when they come for checkup as shown in table 6.

Table no. 6

Evaluated factors	Gujranwala		Sialkot		Attock		Rawalpindi		Sargodha	
	Govt.	Private	Govt.	Private	Govt.	Private	Govt.	Private	Govt.	Private
Knowledge about change in their medication in last 5 years	90%	100%	33.3%	50%	100%	100%	0%	100%	100%	100%
Having previous prescriptions	60%	100%	10%	40%	30%	50%	40%	60%	20%	80%
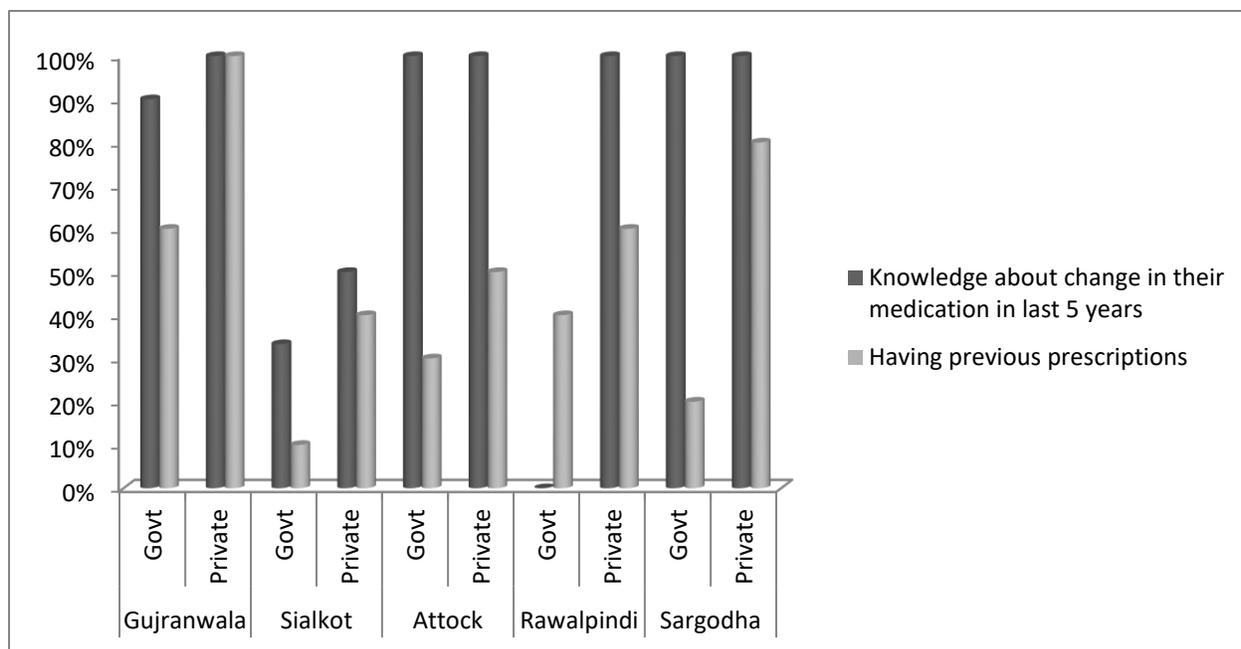
In private sector 86% of patients had an idea about hypoglycemia and what to do for management of such situation. It is also observed that 78% of patients were such that knew about the importance of diet control and 76% of patients who knew the importance of exercise in the management of diabetes mellitus. 60% of patients were on diet control and only 38% of patients who were doing proper exercise. Similarly in government sector 72% of patients had an idea about hypoglycemia and what to do for management of such situation. It is also observed that 66% of patients were such that knew about the importance of diet control and 32% of patients who knew the importance of exercise in the management of diabetes mellitus. 64% of patients were on diet control and only 10% of patients who were doing proper exercise. Results are shown in table 7.

Table no. 7

Evaluated factors	Gujranwala		Sialkot		Attock		Rawalpindi		Sargodha	
	Govt.	Private	Govt.	Private	Govt.	Private	Govt.	Private	Govt.	Private
Idea about hypoglycemia and its management	70%	90%	40%	60%	60%	100%	100%	100%	90%	80%
Knowledge about importance of exercise	70%	100%	30%	60%	10%	100%	0%	60%	50%	60%
Knowledge about importance of diet control	70%	100%	10%	30%	90%	100%	100%	100%	60%	60%
Following diet control	50%	80%	20%	10%	90%	80%	90%	70%	70%	60%
Following proper exercise	30%	30%	10%	0%	0%	70%	0%	60%	10%	30%
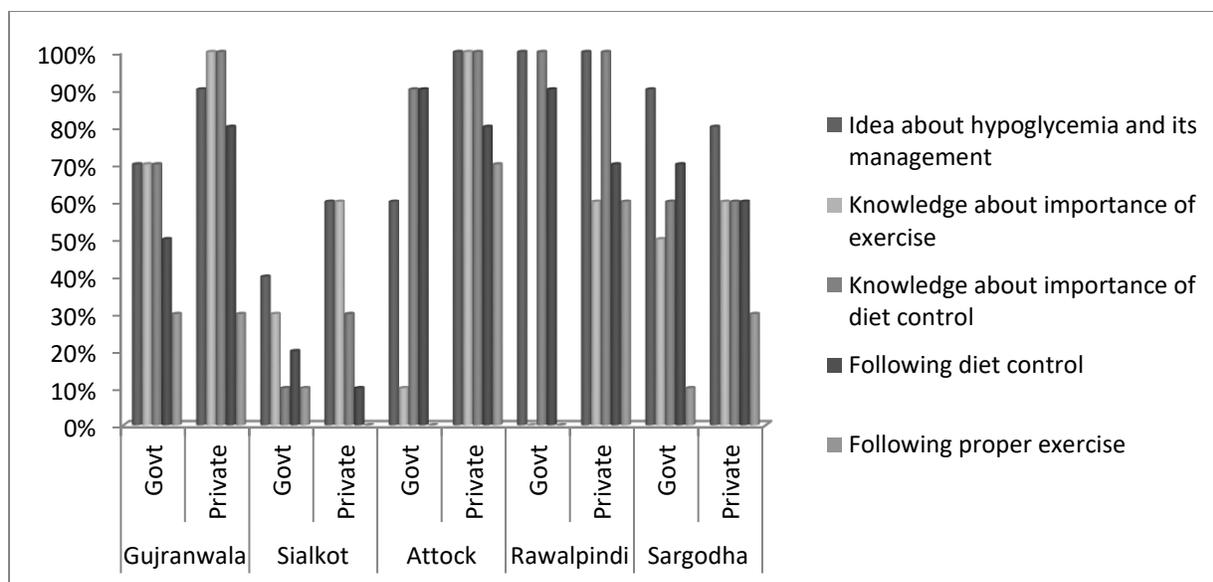
DISCUSSION:

Diabetes mellitus , which is a common problem worldwide and whose prevalence increases with time; is a great risk for economic resources of all communities especially for the poor and developing countries like Pakistan. This diabetes mellitus is not so simple but through its diverse complications can cause so many co-morbid illnesses; which is really complication of lack of awareness. To increase the community wellbeing and decrease economic burden of diabetes mellitus, it is essential to educate the population in general and diabetics especially, make early diagnosis, proper monitoring and management of this disease. The awareness of diabetic population regarding diabetes mellitus is not good world-wide. In Singapore [28], Turkey [29], Iran [24], Saudi Arabia [30] and India [26, 27], the awareness is quiet low i.e. about 30%. In our country studies were conducted to evaluate the population regarding awareness but overall response was nearly same i.e. 30%, matching the international community [25]. In study at Chandka Medical College, Hospital Larkana patients were well aware about diet management and exercise for diabetes mellitus, indicating a better sign for future management. Though many patients knew about hypoglycemia and were aware of hypoglycemia management; but awareness of complications was poor [31]. In our studies we have evaluated the awareness through factors such as how many patients have their own glucometer and frequency of measurement of blood glucose level, idea about hypoglycemia and its management, importance of diet control and exercise in the management of disease and strict followers of the diet control and exercise. The results of the study reveal that percentage of awareness is quite high in private sector in all considered districts of Pakistan as compared to government sector as shown in table 8 and table 9.

Table no 8:

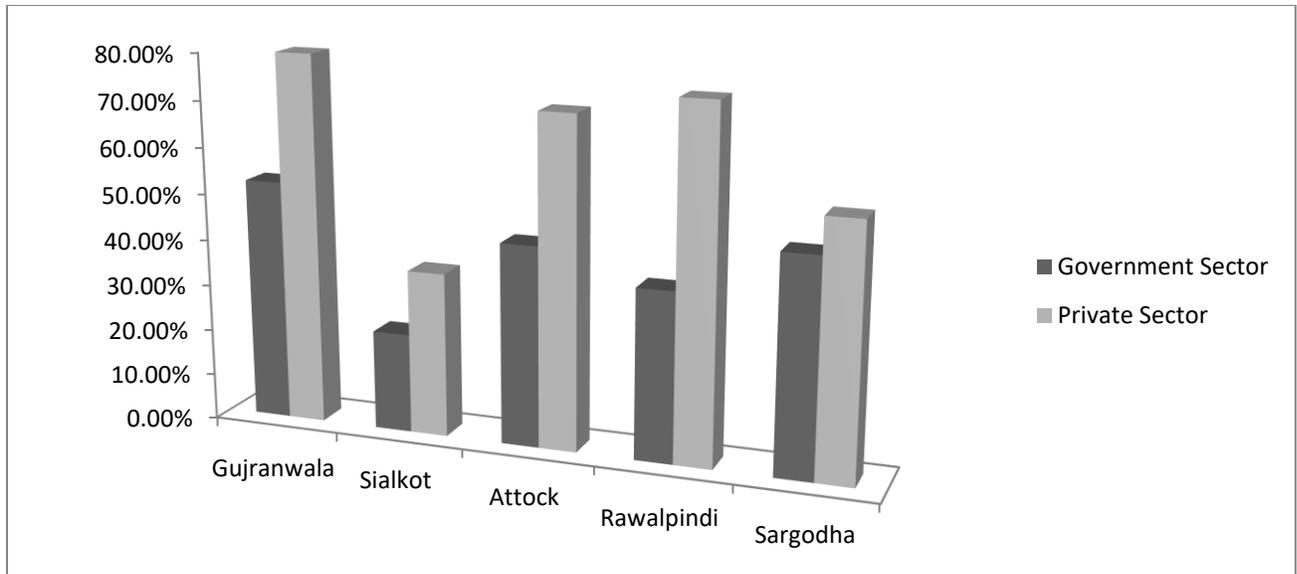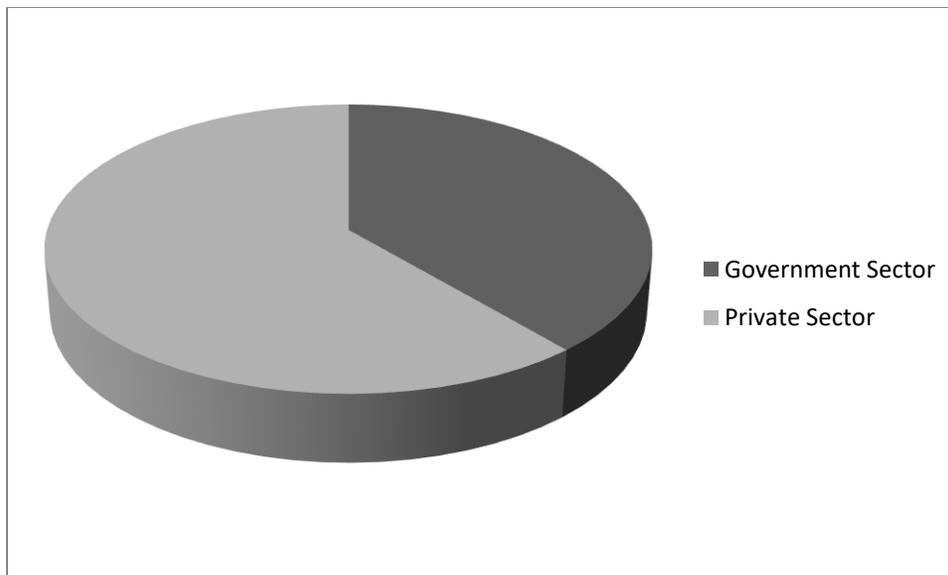| Districts	Government Sector	Private Sector
Gujranwala	52.2%	80%
Sialkot	21.47%	35.5%
Attock	43.3%	71.1%
Rawalpindi	36.6%	75.5%
Sargodha	46.6%	54.4%

Table 9:

Government Sector	Private Sector
40.03%	63.3%

These figures reveal that in government sector important steps are needed to be taken to improve the awareness of disease and its management among diabetic patients. Although in private sector figures are satisfactory but overall situation is alarming and compelling the health managers and authorities to take appropriate steps to increase the awareness of the population regarding diabetes mellitus and its complications in order to make our community healthier and prosperous.

CONCLUSION:

Diabetes mellitus is fairly common in our population along with its complications; but the awareness about the disease in our patients is lacking except an idea about diet control and management of hypoglycemia; compelling for implementation of vigorous education plans regarding awareness of all aspects of diabetes mellitus especially steps should be taken in order to convince the patients to strictly follow the prescriber's advice necessary for the management of diabetes mellitus.

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