Study of Compliance of Diabetic Patients to Prescribed Medication

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Abstract- **Introduction:** The important determinant of treatment success is adherence to recommended medication and it is one of the factors which plays a major role between process of disease and its prognosis. Compliance of patients depends on many factors such as resource limitations, cost of the treatments, patient's beliefs.Diabetes mellitus is a metabolic disorder. There are two types which are type 1 diabetes and type 2 diabetes.In patients with diabetes, non-adherence can lead to many serious complications. Primary goal in management of diabetes is to keep the blood glucose levels stable. Majority of diabetic patients are ineffectual in controlling their blood glucose levels with modifications in diet ,exercise and required medication. The aim of this study was to assess the compliance of diabetic patients to prescribed clinical regimen and factors affecting it.

Material and methods: **Study design** Descriptive cross-sectional study method. **Setting**: It was conducted in hospitals of Faisalabad. **Duration of study**: 6 months; From Jan 2018- June 2018. **Sample size**: 60 diabetic patients. **Sample technique**: random sampling. **Sample selection:** We included diabetic patients of all ages and excluded non-diabetic patients. **Data collection procedure**: provided well-structured close ended questionnaire to diabetic patients. **Data analysis**: SPSS version 20.

Results: According to research, 60% of patients were compliant to medication while 40% of patients were not adherent. 38% people abstain from medicine when they started feeling better. People related to lower socio-economic status were more non-compliant (21.7%). Significant association was found between knowledge of patient about medicine and compliance to medication (p-value0.03).

Conclusion: Compliance to medication is an important factor in managing the diabetes. Several factors affect the medical adherence including socio-economic status, treatment regimen complexity and knowledge of patient about disease and medication.

Index Terms- non-adherence, diabetes mellitus, compliance, factors of compliance.

I. INTRODUCTION

The important determinant of treatment success is adherence to recommended medication. According to WHO, medical adherence is defined as "the degree to which the person's behaviour corresponds with the agreed recommendations from a health care provider". Compliance to treatment is one of the factors which plays a major role between process of disease and its prognosis [1]. Poor compliance to prescribed medication can result in further deterioration of health. Compliance of patients depends on many factors such as resource limitations, cost of the treatments, patients beliefs and expectations that prevent person to follow prescribed medication [2].

Compliance can be divided into two types; When the medication is not available to patient then it is called primary non-compliance and when the medication is not taken as prescribed, by the patients then it is called secondary non-compliance. It can be further divided as intentional and unintentional non-compliance. If diagnosis and treatment of a doctor is rejected by patient then it is called intentional non-compliance and factors like social, demographic, psychological and unawareness to medication can lead to unintentional non-compliance [3].

Diabetes mellitus is a chronic disorder which is metabolic in nature and can result either from decrease in insulin production in body which is Type 1 diabetes or due to increase in insulin resistance which is called Type 2 diabetes. It is a condition which adversely affects quality of life and managing this condition is a complicated task. Diabetes mellitus occurs throughout the world but greatest increase in prevalence occurs in third world countries. According to recent research , 451 million adults have diabetes mellitus [4]. The prevalence of diabetes mellitus type 2 in Pakistan in 2016 was 11.77% [5]. Moreover, in Pakistan the prevalence of diabetes mellitus is very high and estimated to reach 15% (14 million) by 2030[6].

Non-adherence to treatment is a serious problem in patients with chronic diseases like diabetes and adherence to medication is poor in such patients regardless of how much information was given to them about importance of treatment [7.] Prevalence of adherence to diabetes treatment is reported to range from 23% to 77%[8] . According to one research conducted in Pakistan, 35% of patients were found to be non-compliant and 20% were compliant [9]. It is also found in another research that rate of non-adherence in patients with poor knowledge of diabetes is 47% while it is much less (7.8%) in patients who have good knowledge about diabetes [10]. Such minimum adherence in patients can result in poor health outcomes and it also has a notable effect on health care costs[11] like increase costs of outpatient care , ER visits, hospitalization and managing the diabetic complications.

One of the pitfalls of non-adherence in a diabetic patient is that it doubles the risk of hospitalization. Despite the fact that diabetes is manageable and reversible with appropriate management, patients frequently do not comply with recommended treatment. To keep the blood glucose levels stable

and at normal levels is the primary and main goal in management of diabetes, in-order to can prevent or delay other medical hazards that can happen secondary to diabetes. Chances of occurrence of grave complications of diabetes are much less in people who keep their blood sugar levels well-controlled. Poor medication compliance is considerably associated with poor glycemic control. Majority of diabetic patients are ineffectual in controlling blood sugar levels with modifications in diet, exercise and required medication. Pharmacotherapy includes oral hypoglycaemic agents, injectable insulin formulations and combination therapy. Chronic poor glycemic control can lead to high rates of morbidity, mortality and compliance is a key factor regarding this [12].

Complications of diabetes are retinopathy, neuropathy, heart diseases, diabetic foot, kidney failure etc. These complications can prove fatal in non treated person making diabetes the 8th leading cause of death in the world [12].

Objectives:
1) To assess the compliance of diabetic patients to clinical regimen
2) To scrutinise the factors resulting in non-compliance in diabetic patients.

Operational definition:
Compliance is defined as engaging in a response that matches the delivered instructions within 'x' seconds from the time instruction was given and completing request.

II. MATERIAL AND METHODS

i) Study design:
Descriptive cross-sectional study method.
ii) Setting:
It was conducted in hospitals of Faisalabad.
iii) Duration of study:
Duration of this study was 6 months; From Jan 2018- June 2018.
iv) Sample size:
60 diabetic patients.

v) Sample technique:
It was a random sampling
vi) Sample selection:
We included diabetic patients of all ages.
We excluded non-diabetic patients.

Data collection procedure:
We provided well-structured close ended questionnaire to diabetic patients and data was collected.

**Data analysis**:
We analysed our results through SPSS version 20.

III. RESULTS

Different factors including age, sex, education , socio-economic status, duration of diabetes, disease and medicine related knowledge were associated with medication adherence.
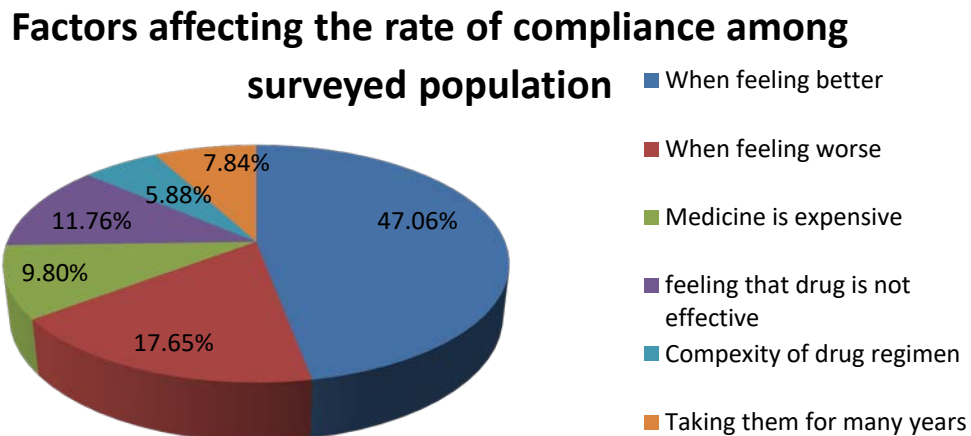
According to research, 60% of patients were compliant to medication while 40% of patients were non-compliant, out of which 25% skip their medicine 1-2 times a week. Modifications in dosage of drug were done by 33% patients. It is found that 38% people abstain from medicine when they started feeling better. Some patients stop taking medicines because they felt that medicine was not effective or it was expensive. Patients who take medicine more than 3 times a day or take both oral and injectable forms are found to be non-compliant because of complexity of regimen. People belonging to lower socio-economic status were found to be more non-compliant (21.7%) as compared to higher socio-economic status(1.7%). Another factor associated with non-adherence is knowledge about diabetes and medicine which 68% of patients do not have and it is based on information given by physicians to patients about disease and medicine(66% of patients were not given any information). Non-compliance was found in old, uneducated, poor people who were ignorant of benefit of medication and complications of diabetes.

Figure1:

Compliance of medication in surveyed population

- Patients are compliant
- Patients are non-compliant
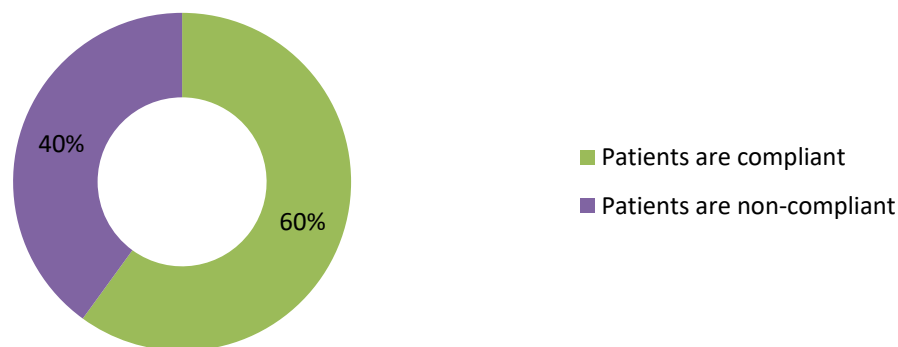
This illustrates that 40% of people do not take medicine at recommended time while 60% of patients are compliant to medication.

Factors affecting the rate of compliance among surveyed population

- When feeling better
- When feeling worse
- Medicine is expensive
- feeling that drug is not effective
- Compexity of drug regimen
- Taking them for many years

Figure2:

This shows that one of main reason for noncompliance in patients is when they start feeling better(47%) Other reasons are complexity of regimen(5.8%)medicine is expensive(9.8%), feeling that drug is not effective(11.7%) or they are taking them for a long time(7.8%).

Figure 3: Relation between compliance of medication and knowledge about Medicine among surveyed population

This illustrates that people with good knowledge about importance of treatment take their medicine at appropriate time while people with no knowledge about importance of medication do not comply to treatment.

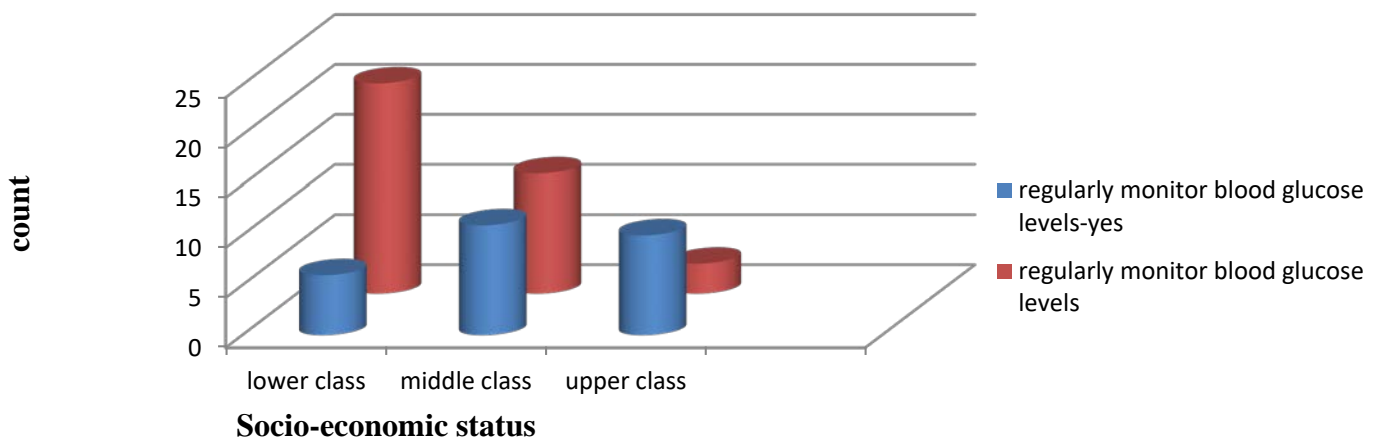- knowledge about medicine-yes
- knowledge about medicine-no
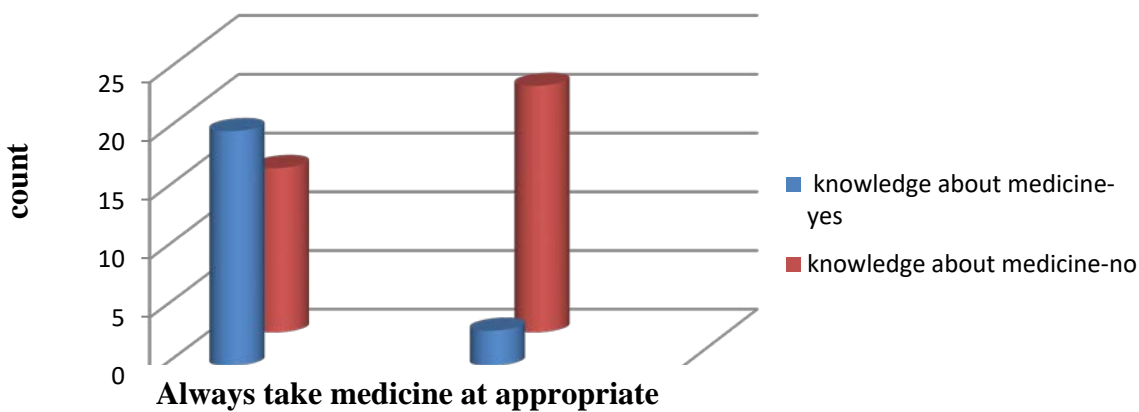
Figure 4: Relation between information given by physician and knowledge about medicine among surveyed population
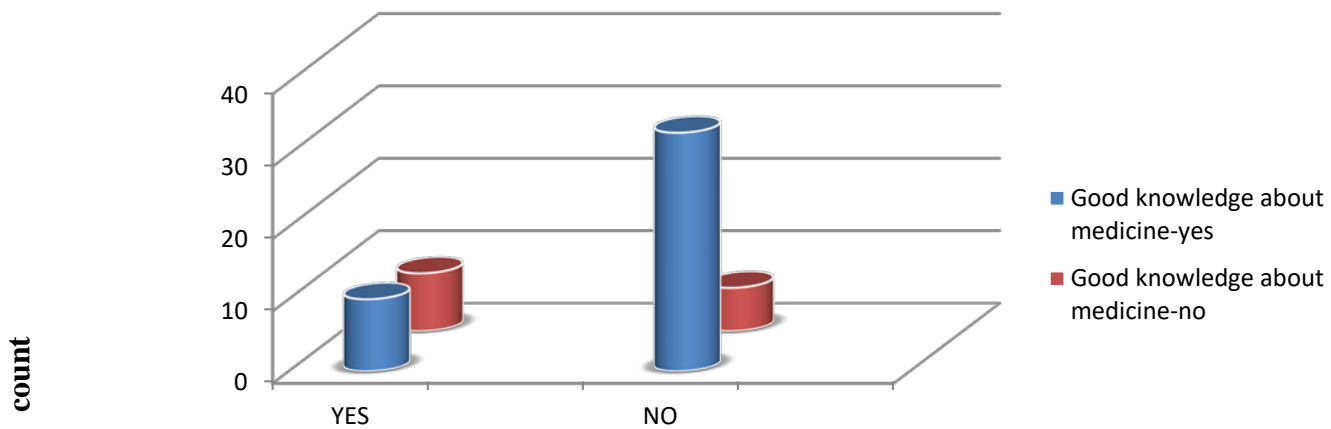
Information given by physician about medicine

This figure shows that patient's knowledge of their disease and medication depends on information given to them by physicians. If information is given by physicians then patients have knowledge about medication and they show compliance while on the other hand people have no knowledge if they are not provided any information and guidance.

Figure 5: Relation between socio-economic status of surveyed population and ability to regularly monitor blood glucose levels
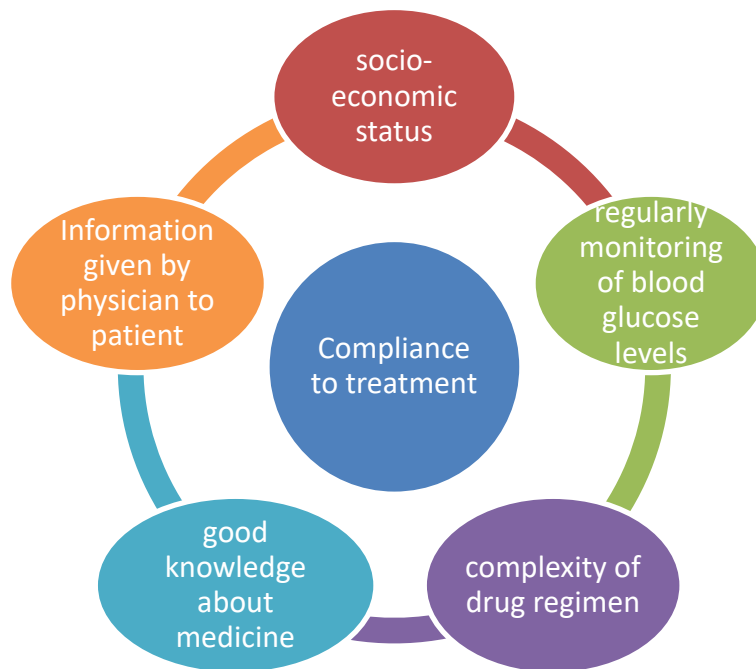

Socio-economic status

This illustrates that people belonging to lower socio-economic status do not regularly monitor their blood glucose levels while people with higher socio-economic status do monitor their blood glucose level

Figure 6:

Factors	p-value
Good knowledge about medicine* always take medicine at appropriate time	0.03
Information given by physician about medicine* good knowledge about medicine	0.00
Socio-economic status* information given by physician about medicine	0.04
Socio-economic status* regularly monitoring of blood glucose	0.001

This figure shows that there is significant association between compliance of patients to treatment and patient's knowledge about medicine.. Good knowledge of patients about medicine is also associated with the information given by physician. Socio-economic status is also found to be significantly associated with information given by physician and ability of patients to regularly monitor their blood glucose levels.

Figure 7: Interrelationship between factors affecting compliance to medication

This figure shows the interrelationship between different factors and adherence to medication

IV. DISCUSSION

In this study, ,the adherence to the diabetic medication was 60% which was associated with socioeconomic status, information given by the physician about medication, patient's knowledge about medication and monitoring of blood glucose regularly by patients.

Socio-Economic status was associated with adherence to medication. In this study people belonging to poor socio-economic status were found to be more non compliant (21.7%). Socio-Economic status is a person's economic and social position that they occupy within a given social structure and it is one of the

major factor which contributes to many cases of diseases and disability, including diabetes[13,14] . Above 80% of deaths due to diabetes occurs in middle and low income countries[15].According to this study, socio-economic status was related to medical compliance as non-compliance was found to be 21.7% in people belonging to lower socio-economic status while non-compliance found in people with higher socio-economic status was 1.7% similar to a study which shows that in people with high income and good socio-economic status adherence increases to 90% [16]. Different studies shows socio-economic status as major determinant of adherence to anti-diabetic and thus low income have been associated with high rates of non-adherence. [17,18,19]

Knowledge of patient about diabetic medication was also an important factor contributing to the compliance to medication. Out of total 40% patients who had poor adherence to medication 68.3% didn't have good knowledge about their medication. In other studies common cause of non-adherence was due to limited knowledge of disease and medication[20.] In another study, the patients who had adequate knowledge about diabetes were found to be 45% and out of which 93.33% of patients were adherent to therapy[21]. In our study patients with better knowledge about medication had better adherence to medication (p-value0.03).

The education status of the patient had no significant relationship with adherence to medication (p-value 0.4) as compared to the study where patients with good education level and knowledge had better treatment adherence (P=0.001)[21].

Information given by physician about diabetic medication to patients had very significant role in medication adherence. Compliance to treatment improves the outcome of a disease, prevents complications of unnecessary interventions[22]. Among total 40% of patients were non-adherent to medication, 66.7% patients didn't get information about medication from their physician. Physician communication is significantly related with patients adherence[23]. Risk of non-adherence is 19% among patients whose physician communicate poorly. This study result shows that information given by physician about medication had a very important role in adherence to medication. Adherence to medication is about 70% in patients who were given information by physician similar to a study which shows that patient's medication adherence becomes 2.16 times better if his physician communicates well with them and there is a significant role between patients adherence to medication and their physician communication and knowledge given by him (P=0.001)[23].

Complexity of drug regimen and cost effective treatment were also important factors which play part in compliance among surveyed group. According to our study, there is significant association between complexity of drug regimen and patient adherence to medication (p-value0.009). Similar results were obtained in another research which shows that adherence decreases with increasing frequency of medication (79% to 94% for once-daily while 38% to 67% for thrice-daily; p-value<0.05) [24].

In our study, Regular checking blood glucose levels was strongly associated with socio-economic status (p-value0.001) but with adherence to medication, it was not found to be significantly associated as compared to the results obtained in other studies which shows that self -monitoring of blood glucose levels lead to better adherence & low glucose levels (P < 0.0001)[25].

Limitations: some factors limit the scope of our study such as small sample size and restricted areas for study. Patient factors were also included like their coordination and willingness to participate in research.

Recommendations: Physicians should provide adequate knowledge about disease and its complications especially to uneducated and to those who belong to lower socio-economic status so that they can show adherence to medication. Also Government should lower down the prices of medicines so that people can afford them.

V. CONCLUSION

It is apparent that diabetes is a progressive disease and to maintain normal blood glucose levels and to reduce adverse outcomes, compliance to medication has an important role. Despite of beneficial outcomes the compliance to medication is suboptimal among diabetic patients. There are several reasons for poor adherence including knowledge of a patient about medicine and disease, complexity of clinical regimen, socio-economic status (poor, uneducated) have key roles in non-adherence to diabetic medication.

Moreover, stoppage of taking medicine when patient start feeling better has also an important role in poor adherence. Certainly, adherence to medication needs to be improved. Measures to improve compliance in diabetic patients should include doctor-patient communication, reduction in complexity of treatment regimen and reduction in cost of medicines.

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