FACTORS AFFECTING PATIENT COMPLIANCE IN THE LONG-TERM THERAPY OF DIABETES MELLITUS AT SERVICES HOSPITAL LAHORE: AN EVIDENCE FOR ACTION

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Abstract:

Background: Diabetes mellitus is a group of diseases, affecting 150 million people worldwide. Demographic projections by the World Health Organization (WHO) estimates an increase in adults with diabetes in Pakistan from 4.3 million in 1995 to 14.5 million in 2025 making Pakistan the fourth highest country. The key to controlling diabetes lies in its management via medicines, diet plans and lifestyle changes. As with other long term treatments, the compliance of diabetics remains an important barrier which needs to be addressed in order to achieve improved results. This research was undertaken as an effort to study and identify the variables affecting patient compliance in Services hospital, Lahore and to determine strategies for enhanced compliance.

Objectives: To correlate the life style of the people with their adherence to chronic life-long therapy (dietary and medical both), To highlight the barriers to patient's compliance in subjects, To determine the consequences of patient's Non-Compliance in Diabetes Mellitus, To formulate a health education program for improvement of patient compliance.

Study Design: Descriptive epidemiological study.

Study Setting: Diabetes Management Centre (DMC), Services Hospital, Lahore.

Study Duration: 1 month (June 2012-July 2012).

Respondents and Methods: 64 Patients of different age groups were studied. Data was collected through pre- tested Questionnaire.

Results: Our study showed that 78.1 percent of the patients had a good knowledge of their disease. 76.6 percent were strictly complaint to their drug dosage regimens. Among the reasons for non-compliance, 7.8 percent listed forgetting to take the drug and 7.8 percent listed high cost of the medicine .Dietary compliance was 31.3 percent, and the reasons given by patients included inability to resist tempting food(39. Percent) whereas did not consider it important (26.6 percent). 42.18 percent of the patients were complaint to lifestyle modification i.e physical activity.

Conclusion: Most of the patients regularly took medicines, wheras the rate of dietary non- compliance was the highest, with exercise compliance following closely. Education remains the cornerstone for compliance to long term therapies like diabetes since only when a patient sufficiently understands the disease and its complications will he seriously follow medicinal, dietary and exercise advice.

Keywords: *Factors, Patient compliance, Diabetes Mellitus.*

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INTRODUCTION:

Diabetes mellitus is a group of metabolic diseases characterized by high blood glucose, either because the body does not produce enough insulin, or because cells do not respond to the insulin that is produced. The two main types of diabetes mellitus (DM) are:

•   Type 1 DM (insulin dependent)
•   Type 2 DM (Non-insulin Dependent)

Globally, as of 2010, an estimated 285 million people had diabetes, with type 2 making up about 90% of the cases (1) and this number is expected to rise to 300 million in the year 2025 (2). The prevalence of DM in Pakistan is reported as high as 10% among adults with an equal number of people are suffering from glucose intolerance.(3,4) According to WHO estimates, Pakistan is currently eighth in the prevalence of DM and will become fourth by the year 2025 with over 15 million individuals.(5). In healthcare system, compliance is described as patient's behaviors (in terms of taking medication, following diets, or executing life style changes) coincide with healthcare providers' recommendations for health and medical advice(6) (Sackett 1976). Both the patient and the health-care provider affect compliance, and a positive physician- patient relationship is the most important factor in improving compliance (7) although the high cost of prescription medication also plays a major role. Thus, therapeutic non- compliance occurs when an individual's health-seeking or maintenance behavior lacks congruence with the recommendations as prescribed by a healthcare provider.

As diabetes mellitus is a challenging disease to manage successfully, regimen compliance problems are common in individuals with diabetes. Non-compliance may include:

1-Failure to take medicines/injections as directed.
2- Failure to follow the dietary instructions
3-Failure to follow exercise plan

Non-compliance could have a major effect on treatment outcomes and direct clinical consequences; it is directly associated with poor treatment outcomes in patients with diabetes.it can   lead   to chronic complications associated   with   DM affecting cardiovascular (small   vessel diseases) , cerebrovascular, renal(kidney disease), nervous system(neuropathies) along with the foot(ulcers and gangrene) and eye(retinopathies) and place huge financial burdens on individual patients, their families and communities at large. A WHO study estimates that only 50% of patients suffering from chronic diseases in developed countries follow treatment recommendations (7). In other studies, adherence rates of 65% were reported for diet (8) but only 19% for exercise. (9) Once-daily or twice-daily regimens yield adherence rates of 80% to 90%, compared with 60% to 65% with three daily doses (10).

MATERIAL AND METHOD:

For the vast majority of Pakistani patients, knowledge of their condition remains low. Jabbar et al. from outpatient clinics in Karachi, found significant knowledge gaps in key areas, including insulin administration. Similar results were reported in a study from an outpatient clinic in Quetta where 77.11% of diabetic patients had no knowledge of diabetes and its complications. The duration of the disease is an important factor controlling compliance. The rate of non-compliance in patients with chronic diseases in developed countries, on long-term treatment, is on the order of 50%. This could be even higher in developing countries (WHO) (14). One study showed that while diabetic and cardiac patients who take medication correctly have a 7% death rate; for those who are non-compliant the death rate is 12%.

Patient compliance is expected to be greater if they have a good knowledge of their disease and the complications it may lead to. A study was conducted to measure the rate of non-compliance and the factors contributing to non-compliance among the diabetic patients in the Al Hasa region of Saudi Arabia (15). The overall prevalence of therapeutic non-compliance of the participants was 67.9%. The non-compliance of males (69.34%) was higher than females (65.45%). There was a statistically significant difference in the prevalence rate of non-compliance among the participants of different educational levels. It was highest among the illiterates (72.6%,), falling as the level of education rose. It was, 61.60% among those with primary school education , 47.61% among those with secondary school education , and 45.83% in those educated beyond high school. In a 2005 review by Rubin, the patient's comprehension of the treatment regimen and benefits, adverse effects, medication costs, regimen complexity, and the patient's emotional well-being were noted as factors affecting adherence with diabetes treatment (16). Other factors that have been associated with poorer medication adherence in those with diabetes include depression, dosage frequency greater than once daily and bothersome side effects. A key factor affecting medication adherence, especially for older adults, is cost-related issues. Studies have shown that older adults skip doses, reduce doses, or do not get prescriptions filled because they cannot afford to pay for medications. Madden et al. (17) recently

examined the changes in cost-related medication non-adherence after implementation of the Medicare prescription drug benefit and found a small but significant decrease in medication non-adherence related to cost. Self-care activities were studied among diabetic population of urban southern India (18). Good dietary behaviour was present in 29% , good exercise behaviour in 19.5% , regular blood sugar monitoring in 70% and drug adherence in 79.8%. This reflects that self-care activities with respect to diet and exercise are poor in the population studied. However, self-care activities relating to blood sugar monitoring and drug adherence are good.

Materials and Methodology
Study Design:- Descriptive Epidemiological Study
Study Area:-   This research was conducted in Diabetes Management Center, Services Hospital Lahore, Pakistan.
Study Subject:- Inclusion Criteria:-
•   Both sexes
•   All ages
•   Diagnosed cases
•   Type-I & Type-II
•   Willing to participate

Exclusion criteria:
•   Non diabetic
•   Non willing
Ethical Clearance:-
All the subjects were explained the purpose and process of the study. They were
Explained the benefits of study assurance were given to protect life, health, privacy and dignity of human study subject.
Data Collection Methods: Questionnaire method
Instruments:- Data was collected through a structured questionnaire.
Sample size: 64 patients of diabetes completed the questionnaire which was designed to
study their compliance to medical advice, exercise plan and diet chart for the management of their disease. It contained close and open ended questions related to general knowledge   of
        the disease   and   their
   adherence   to   treatment.
Data Management and Analysis Plan: Epi info and SPSS computer software was used for entry, compilation and analysis of data. Descriptive and inferential stat was applied on data. Chi Square test of significance were applied on data.

**RESULTS:**
Sir! I did my level best, hopefully it will work…….

Table No 1: Disease and Complication Knowledge in the Patients

| Details		Number	Percentage
Knowledge of Disease	**Well Informed**	50	78.1
	Poorly Informed	14	21.9
Knowledge about Complication	**Well Informed**	17	26.6
	Poorly Informed	47	73.4
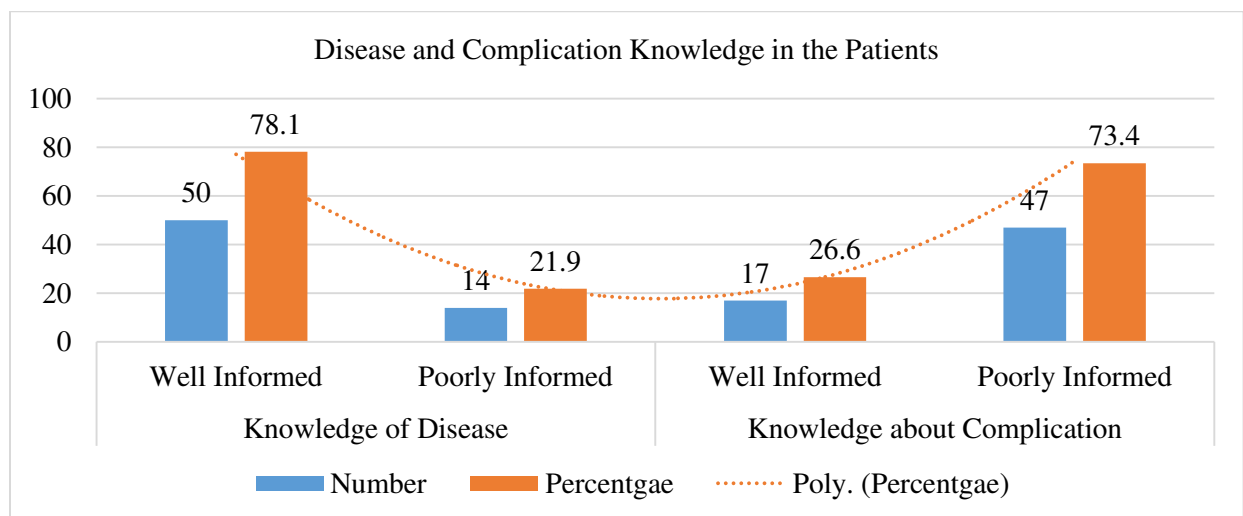
Table No 2: Degree of Satisfaction of the patient regarding the physician

| Degree of Satisfaction	Frequency	Percent	Valid Percent	Cumulative Percent
Satisfactory	41	64.1	64.1	64.1
Unsatisfactory	23	35.9	35.9	100
Total	64	100	100	

Degree of Satisfaction of the patient regarding the physician
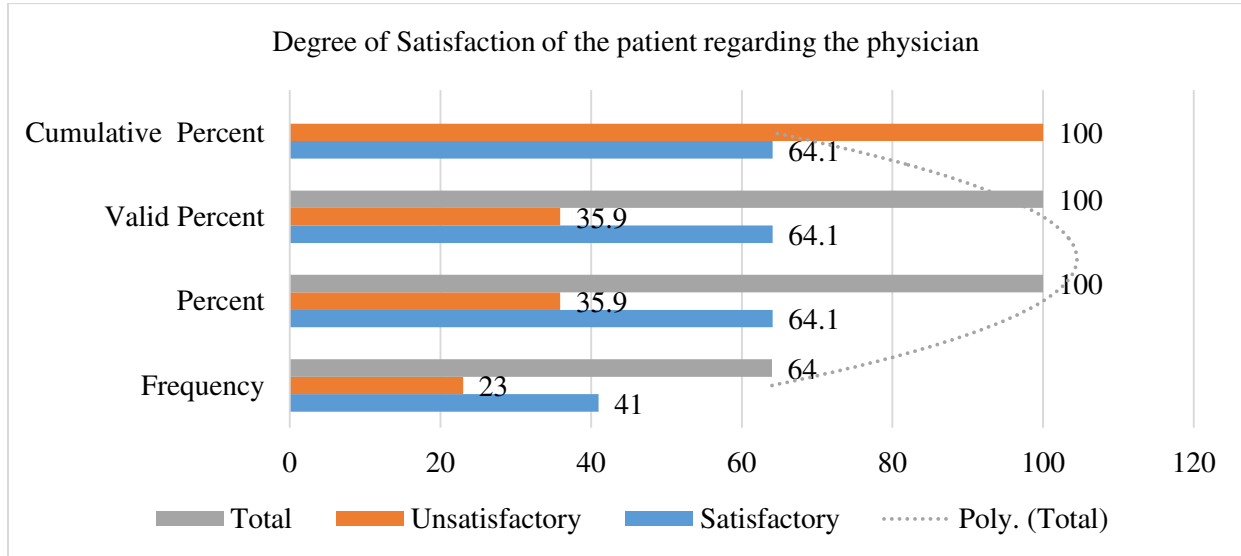
Table No 3: Trends of Follow-up among diabetics

Visits to clinic	Frequency	Percent	Valid Percent	Cumulative Percent
Never	10	15.6	15.6	15.6
Once a month	35	54.7	54.7	70.3
Every Six Months	11	17.2	17.2	87.5
Once a Year	8	12.5	12.5	100
Total	64	100	100	

Trends of Follow-up among diabetics
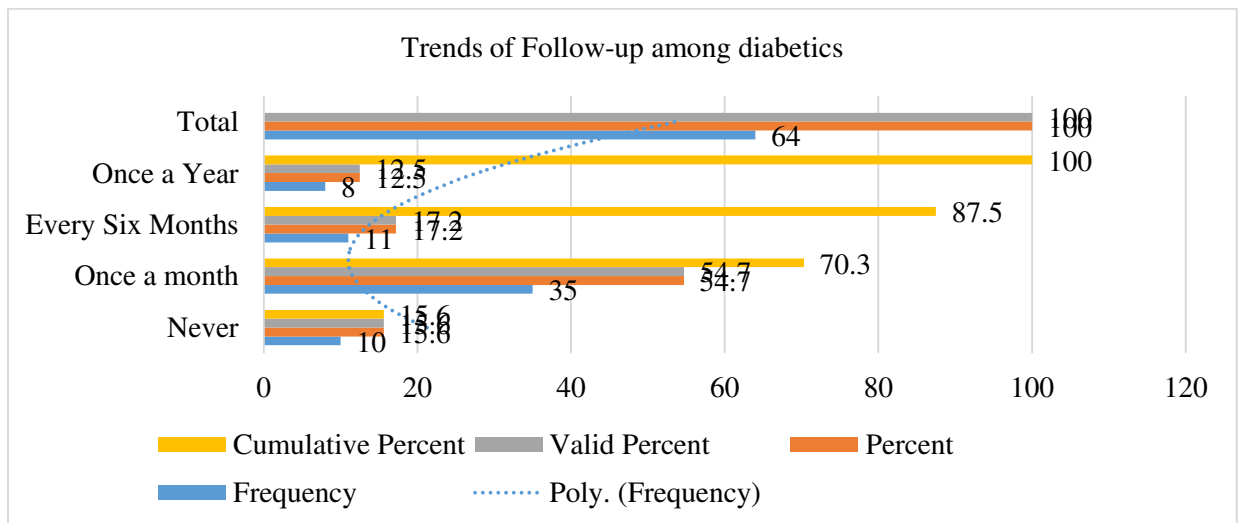
Table No 4: Pattern of drug intake among diabetics

Regularity	Frequency	Percent	Valid Percent	Cumulative Percent
Strictly regular	49	76.6	76.6	76.6
Irregular	9	14.1	14.1	90.6
Occasionally miss the dose	6	9.4	9.4	100
Total	64	100	100	

Pattern of drug intake among diabetics
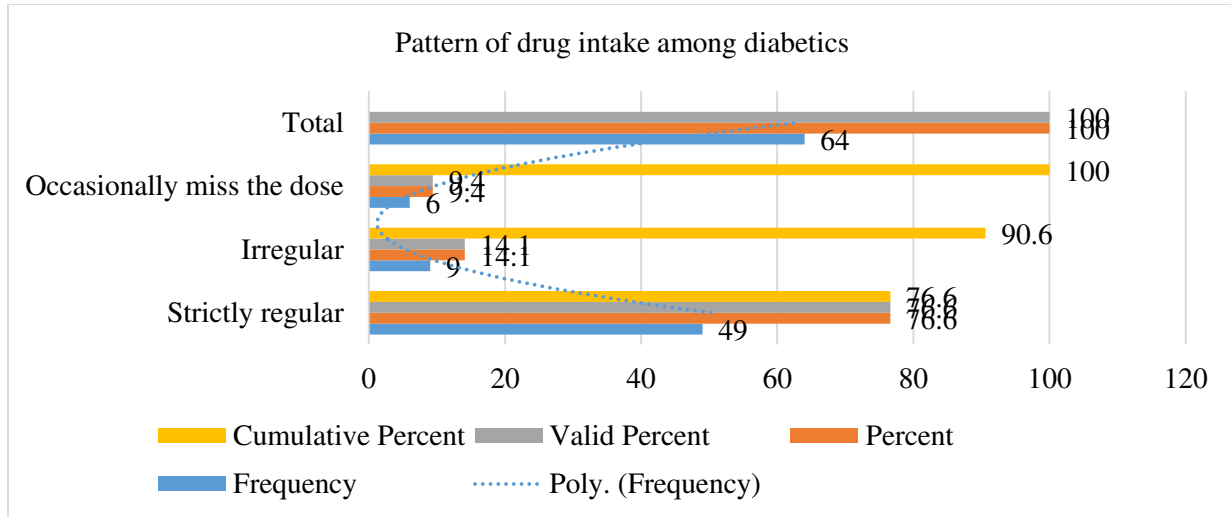
Table No 5: Consumption of Drugs without a doctor's prescription

Response	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	21	32.8	32.8	32.8
No	43	67.2	67.2	100
Total	64	100	100	

Consumption of Drugs without a doctor's prescription
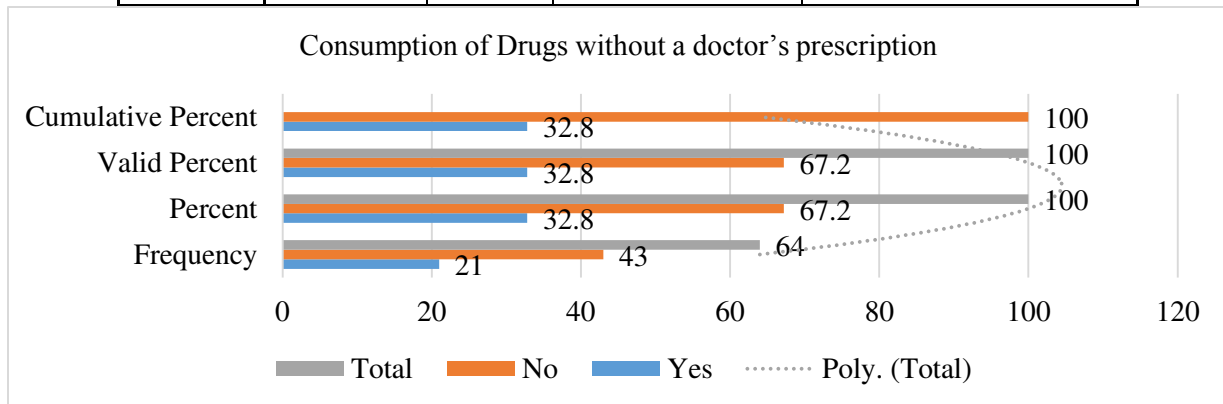
Table No 6: Patient's Knowledge

Knowledge	Frequency	Percent	Valid Percent	Cumulative Percent
Well informed	59	92.2	92.2	92.2
Poorly Informed	5	7.8	7.8	100
Total	64	100	100	

Patient's Knowledge

Cumulative Percent	100 / 92.2
Valid Percent	100 / 7.8 / 92.2
Percent	100 / 7.8 / 92.2
Frequency	64 / 5 / 59

Legend: Total, Poorly Informed, Well informed, Poly. (Total)
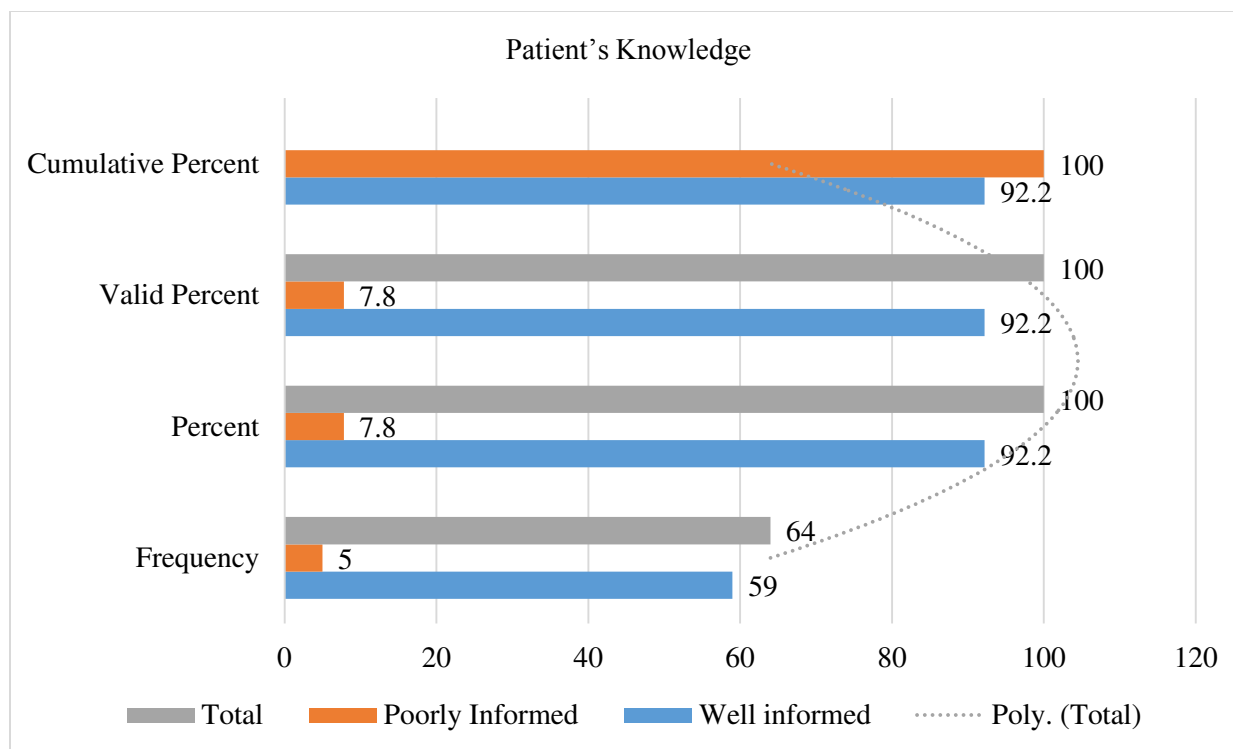
Table No 7: Reason of Medical Non-Compliance

Reasons	Frequency	Percent	Valid Percent	Cumulative Percent
Expensive drugs	44	68.8	68.8	68.8
Forgets	5	7.8	7.8	84.4
Too Busy	5	7.8	7.8	84.4
Does not consider Important	1	1.6	1.6	85.9
Side effects of drugs	3	4.7	4.7	90.6
Never got proper medical advice	1	1.6	1.6	92.2
Depends on mood	3	4.7	4.7	96.9
Any other	1	1.6	1.6	98.4
Total	64	100	100	100

Reason of Medical Non-Compliance
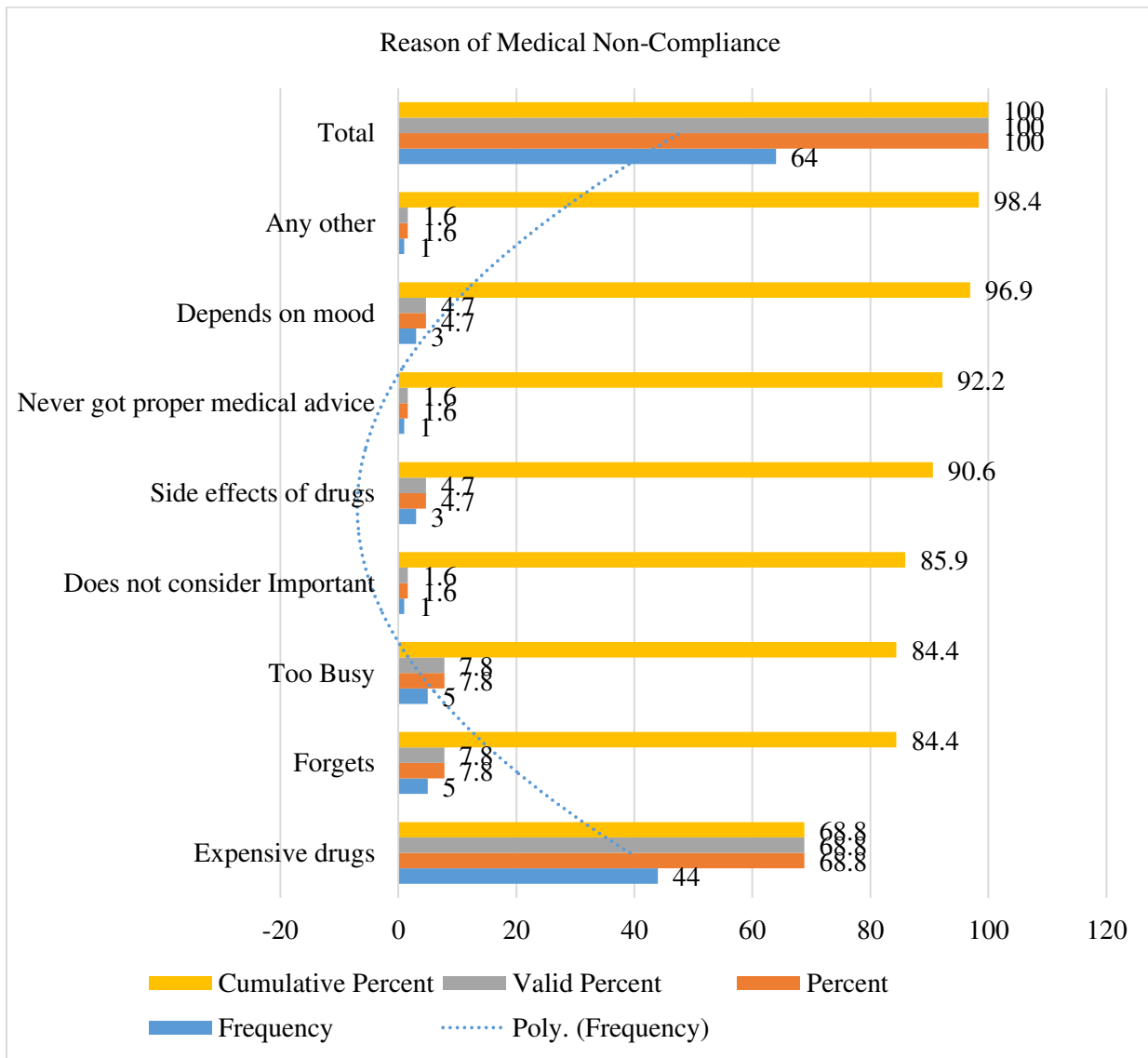
Table No 8: Drug intake

Drug Intake	Frequency	Percent	Valid Percent	Cumulative Percent
Himself	40	62.5	62.5	71.9
Dependent upon someone else	18	28.1	28.1	100
Total	64	100	100	
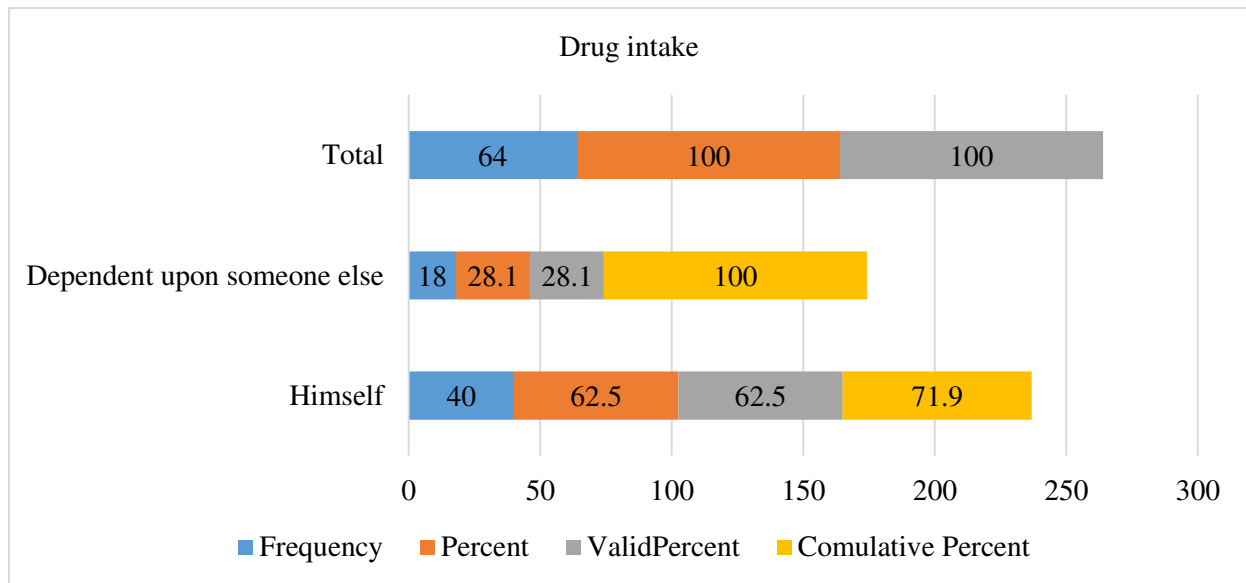
Table No 9: Strayed Patients

No. of times strayed	Frequency	Percent	Valid Percent	Cumulative Percent
Never	20	31.3	31.3	31.3
Once	22	34.4	34.4	65.6
Twice	12	18.8	18.8	84.4
Thrice or more	10	15.6	15.6	100
Total	64	100	100	
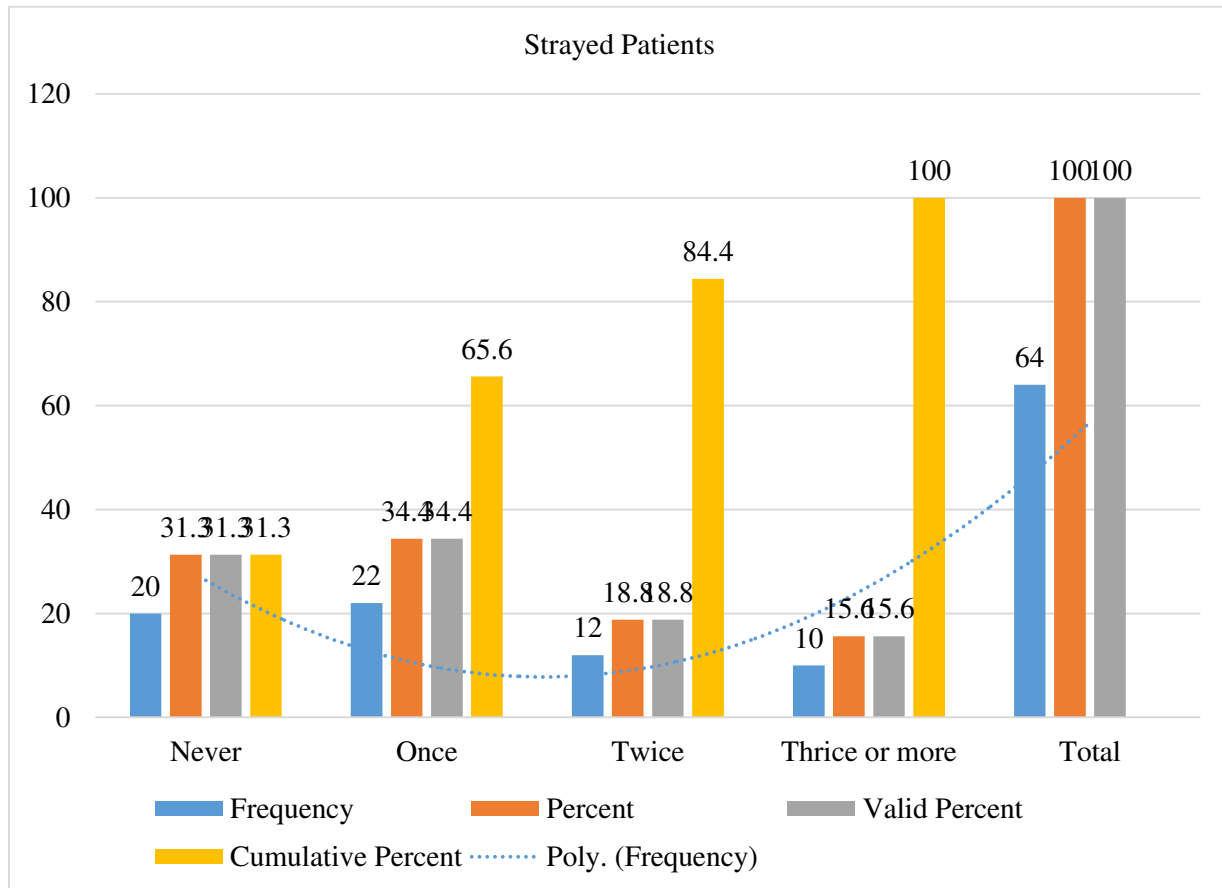
Table No 10: Reason of non-compliance

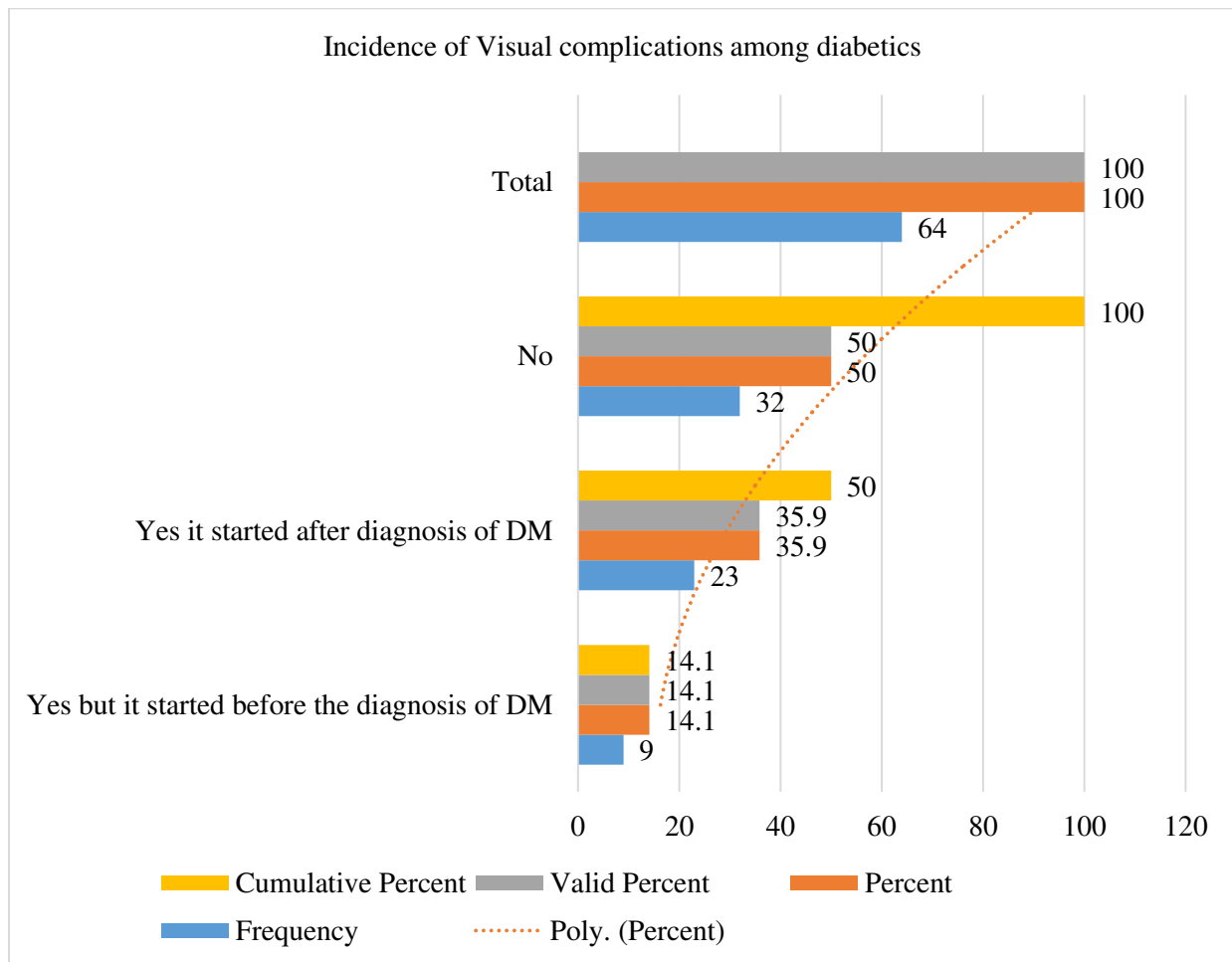| Reasons	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	16	25	25	25
Does not consider it important	17	26.6	26.6	51.6
Recommended food is expensive	1	1.6	1.6	53.1
Not easily available	1	1.6	1.6	54.7
Followed plan for a while but did not improve BSR	1	1.6	1.6	56.3
Tempting Food	25	39.1	39.1	95.3
Others	3	4.7	4.7	100
Total	64	100	100	
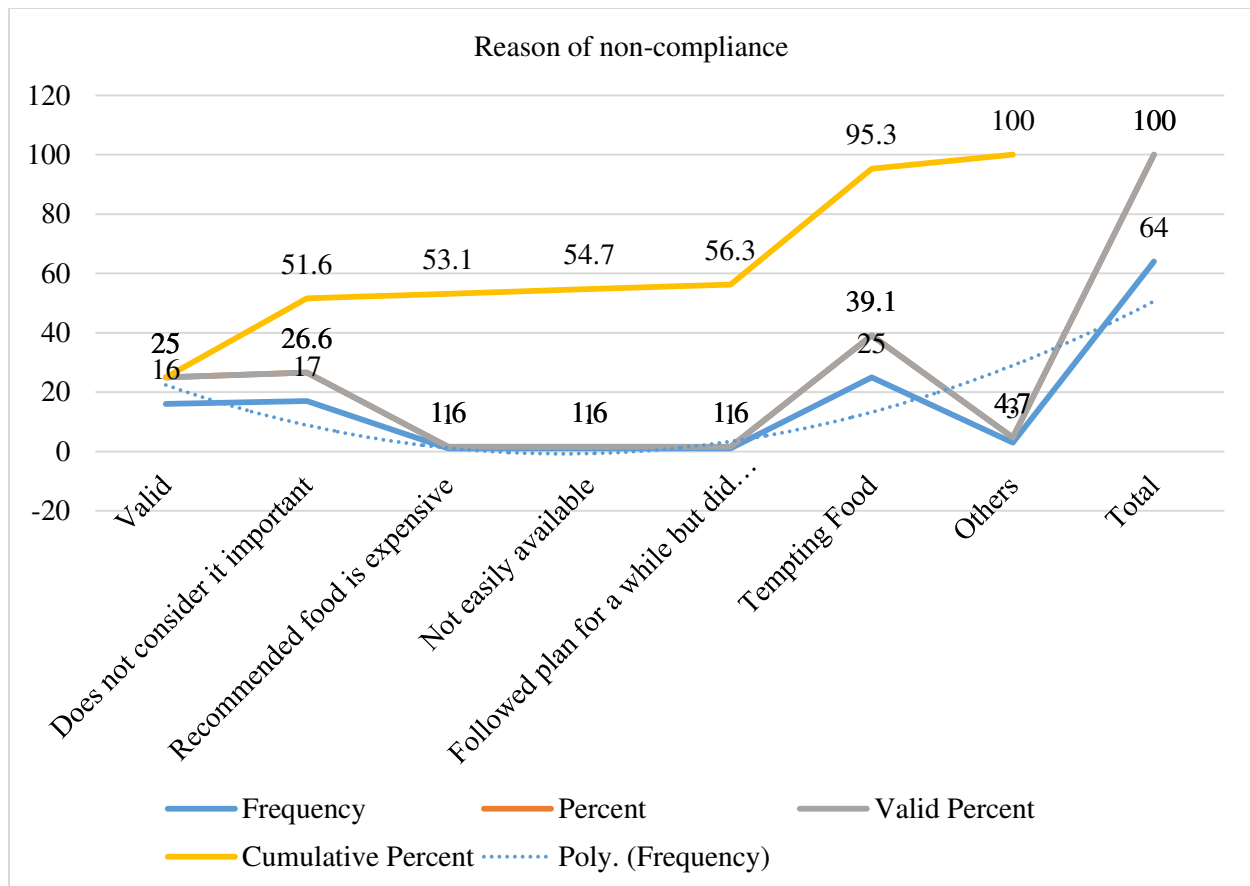
Table No 11: Knowledge of importance of exercise for diabetics among diabetes patients

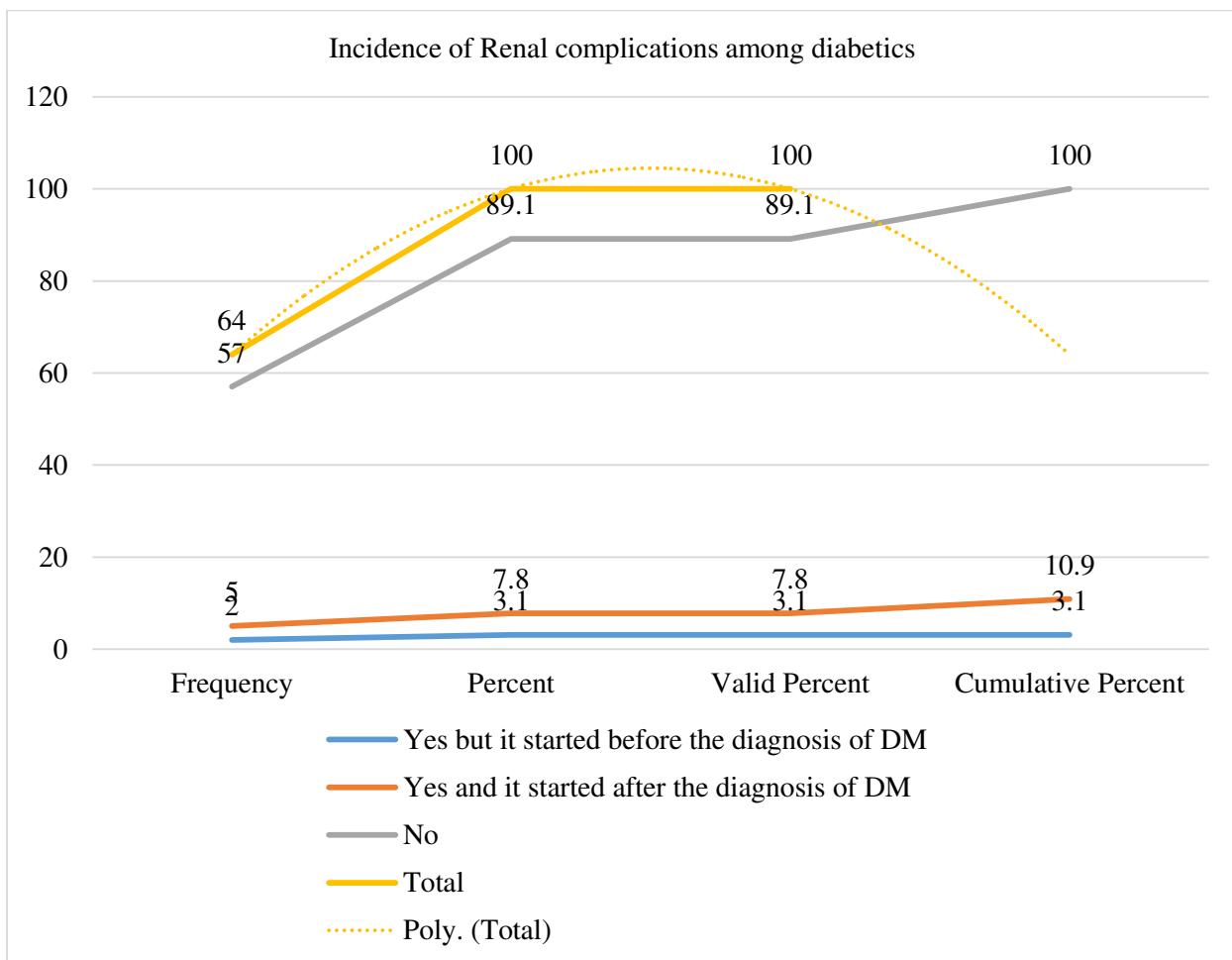| Knowledge	Frequency	Percent	Valid Percent	Cumulative Percent
Well Informed	56	87.5	87.5	87.5
Poorly Informed	8	12.5	12.5	100
Total	64	100	100	
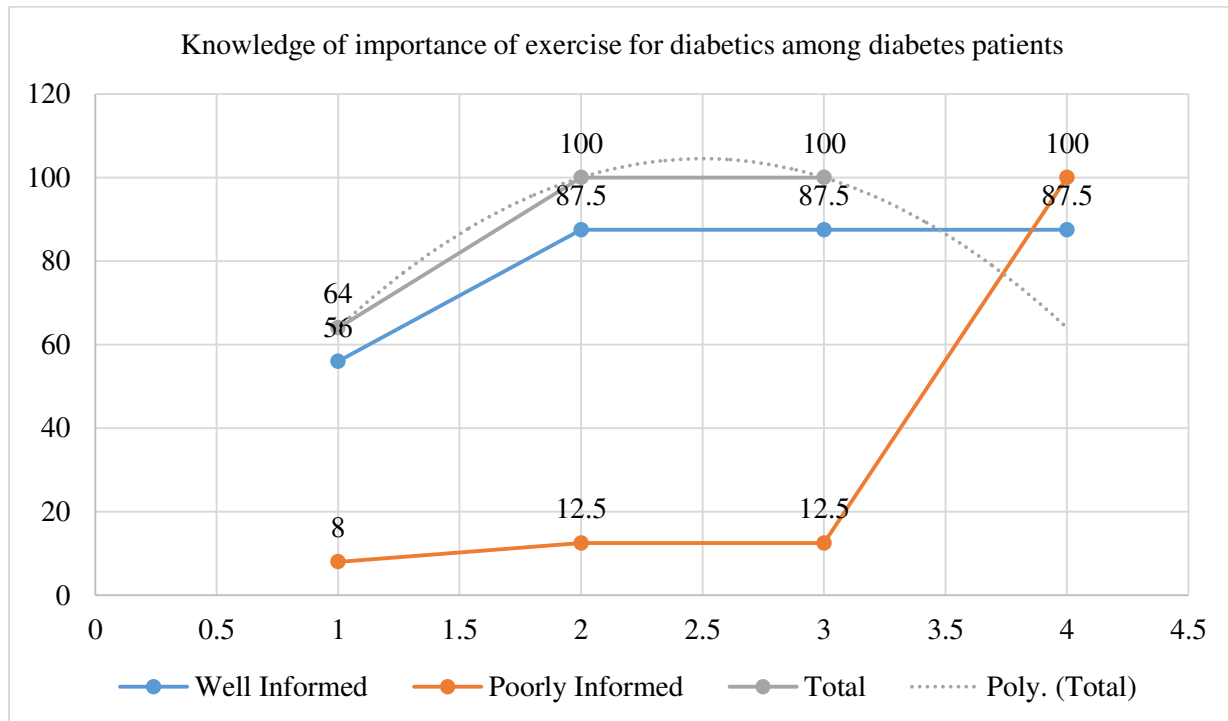
Table No 12: Incidence of Visual complications among diabetics

Visual Complication Incidence	Frequency	Percent	Valid Percent	Cumulative Percent
Yes, but it started before the diagnosis of DM	9	14.1	14.1	14.1
Yes, it started after diagnosis of DM	23	35.9	35.9	50
No	32	50	50	100
Total	64	100	100	

Incidence of Visual complications among diabetics

Table No 13: Incidence of Renal complications among diabetics

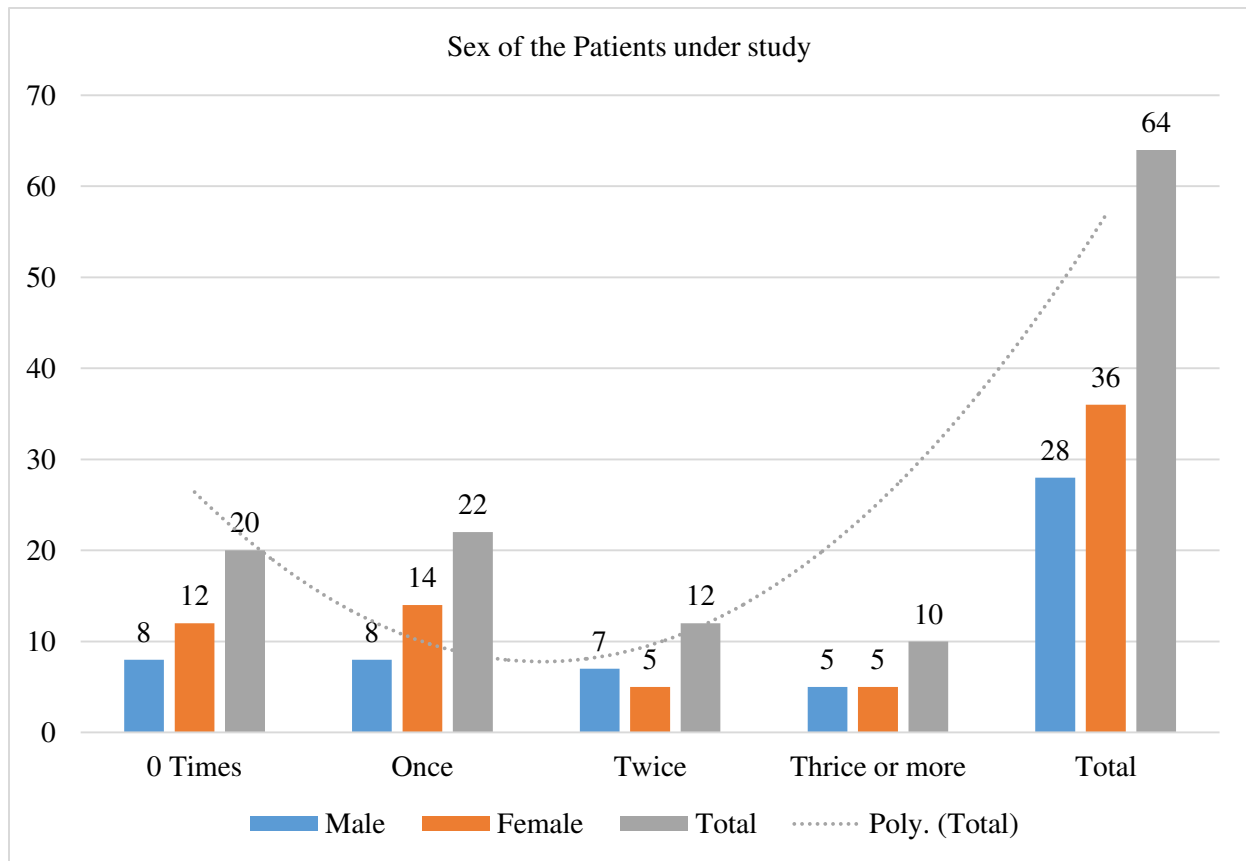| Renal Complication Incidence	Frequency	Percent	Valid Percent	Cumulative Percent
Yes, but it started before the diagnosis of DM	2	3.1	3.1	3.1
Yes, and it started after the diagnosis of DM	5	7.8	7.8	10.9
No	57	89.1	89.1	100
Total	64	100	100	

Table No 14: Incidence of peripheral neuropathy among diabetes patients

Peripheral Neuropathy Incidence	Frequency	Percent	Valid Percent	Cumulative Percent
Yes, but it started before the diagnosis of DM	3	4.7	4.7	4.7
Yes, and it started after the diagnosis of DM	34	53.1	53.1	57.8
No	27	42.2	42.2	100
Total	64	100	100	

Incidence of peripheral neuropathy among diabetes patients
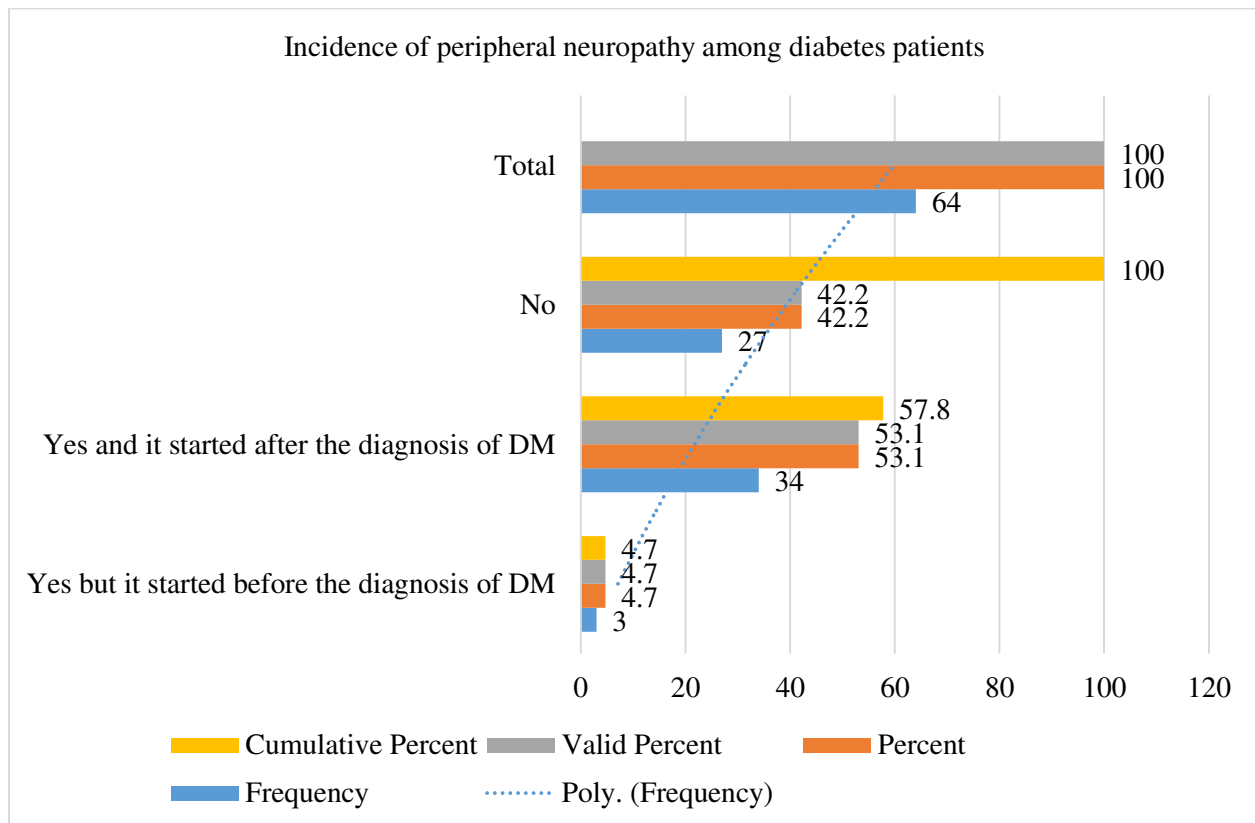
Table No 15: Sex of the Patients under study * Number of times strayed from diet chart in past 24 hours Cross tabulation

Sex of the Patients under study	Number of times strayed from diet chart in past 24 hours				Total
	0 Times	Once	Twice	Thrice or more	
Male	8	8	7	5	28
Female	12	14	5	5	36
Total	20	22	12	10	64

Table No 16: Chi-Square Tests(a)

(a)	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.194a	2	0.045
Likelihood Ratio	6.513	2	0.039
N of Valid Cases	64		

a. 3 cells (50.0%) have expected count less than 5.
The minimum expected count is 2.63.

Table No 17: Pattern of drug intake among diabetics

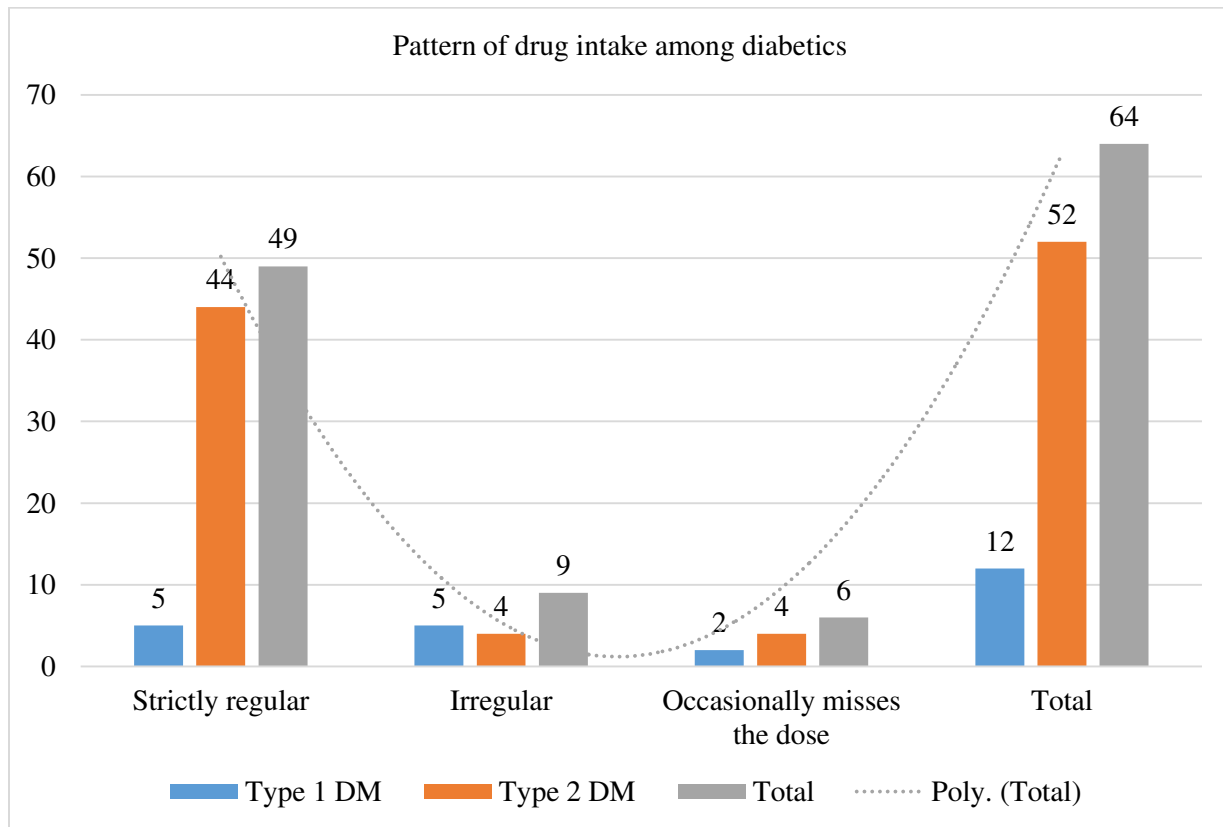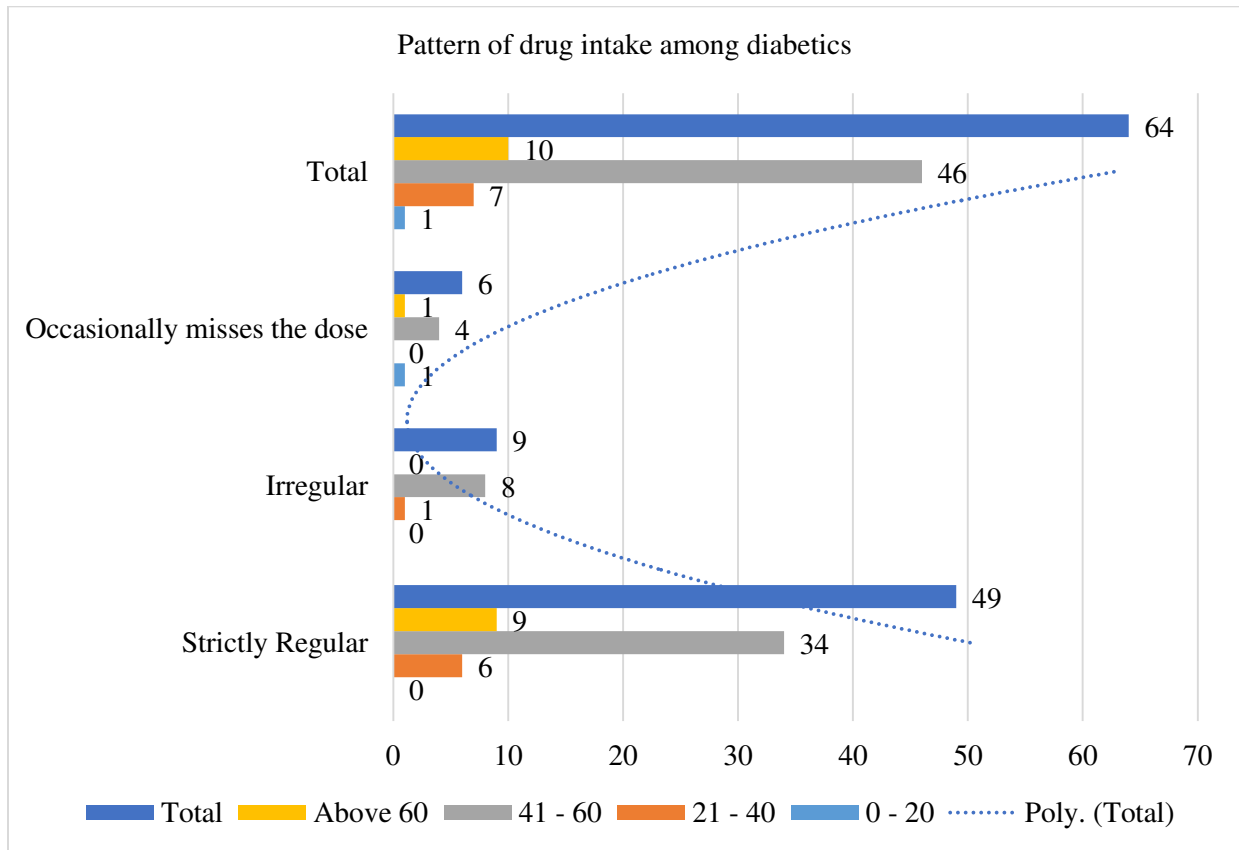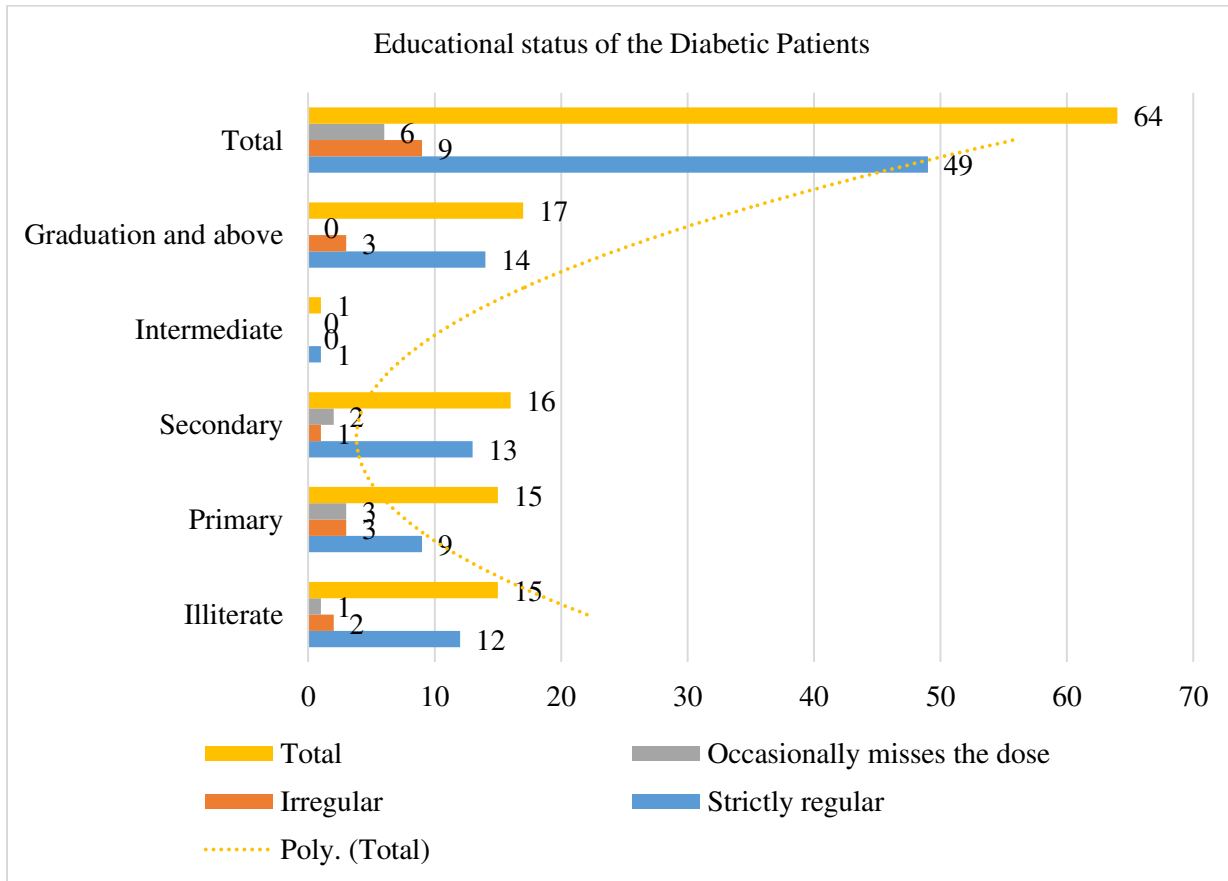| Diabetic intake pattern		Strictly regular	Irregular	Occasionally misses the dose	Total
Type of Diabetes	**1**	5	5	2	12
	2	44	4	4	52
Total		49	9	6	64

Table No 18: Pattern of drug intake among diabetics

Age of the Diabetic Patients (Years)	Strictly Regular	Irregular	Occasionally misses the dose	Total
0 - 20	0	0	1	1
21 - 40	6	1	0	7
41 - 60	34	8	4	46
Above 60	9	0	1	10
Total	49	9	6	64

Pattern of drug intake among diabetics

Table No 19: Educational status of the Diabetic Patients * Pattern of drug intake among diabetics
Cross tabulation

Educational status of the Diabetic Patients	Pattern of drug intake among diabetics			Total
	Strictly regular	Irregular	Occasionally misses the dose	
Illiterate	12	2	1	15
Primary	9	3	3	15
Secondary	13	1	2	16
Intermediate	1	0	0	1
Graduation and above	14	3	0	17
Total	49	9	6	64

Educational status of the Diabetic Patients

Table No 20: Degree of satisfaction of the patient regarding the physician * Trends of Follow up among diabetics' Cross tabulation

Degree of satisfaction of the patient regarding the physician	Trends of Follow up among diabetics				Total
	Never	Once a month	Every Six Months	Once a Year	
Satisfactory	3	29	5	4	41
Unsatisfactory	7	6	6	4	23
Total	10	35	11	8	64
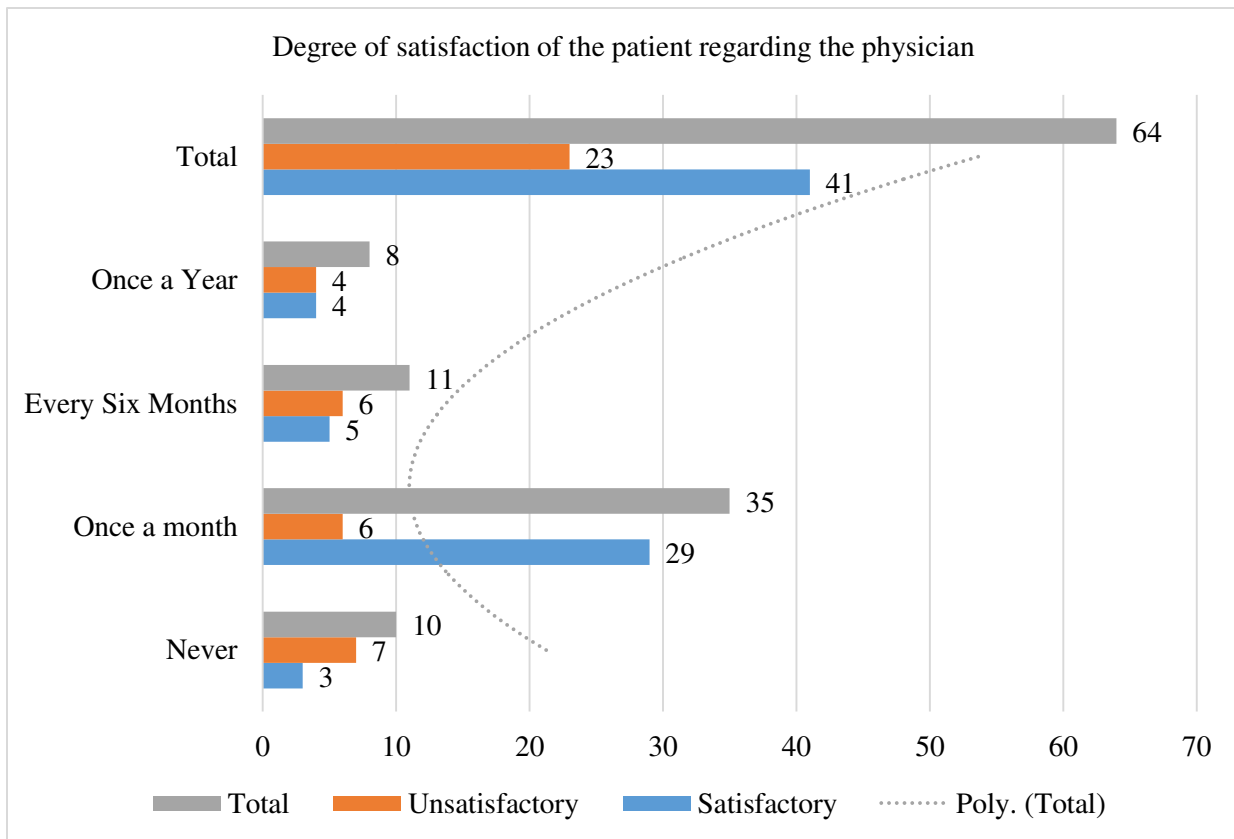
Table No 21: Chi-Square Tests (e)

(e)	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.751a	3	0.005
Likelihood Ratio	13.055	3	0.005
N of Valid Cases	64		

a. 3 cells (37.5%) have expected count less than 5.
The minimum expected count is 2.88. Bar chart 1.5

Table No 22: Knowledge of importance of exercise for diabetics among diabetes patients * Frequency of Exercise among diabetes patients Crosstabulation

Knowledge	Frequency of Exercise among diabetes patients			Total
	Does not exercise at all	Occasional	Regularly	
Well Informed	18	13	25	56
Poorly Informed	6	0	2	8
Total	24	13	27	64
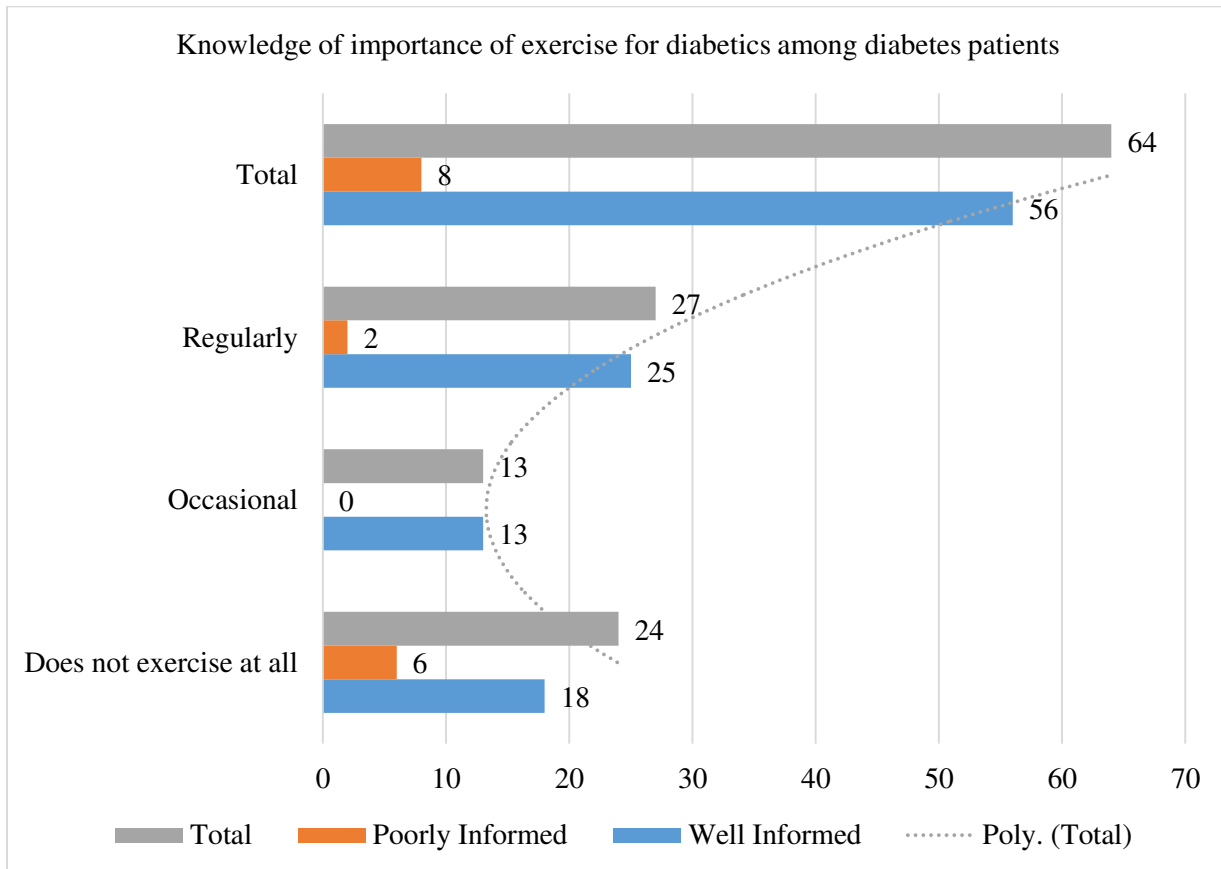
Table No 23: Chi-Square Tests (g)

(g)	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.926a	2	0.052
Likelihood Ratio	6.976	2	0.031
N of Valid Cases	64		

Table No 24: Sex of the Patients under study * Frequency of Exercise among diabetes patient's Cross tabulation

Sex of the Patients under study	Frequency of Exercise among diabetes patients			Total
	Does not exercise at all	Occasional	Regularly	
Male	8	7	13	28
Female	16	6	14	36
Total	24	13	27	64
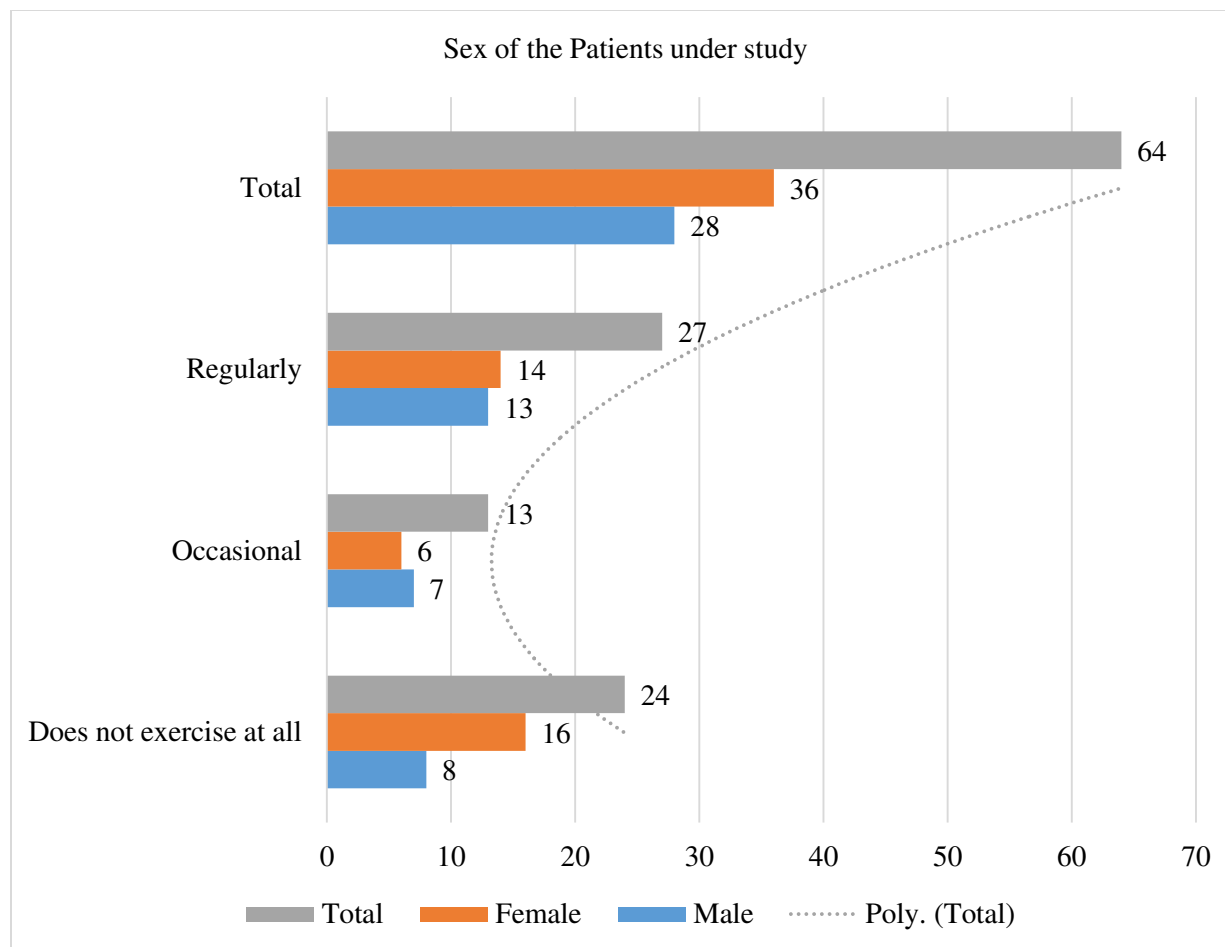
DISCUSSION

This study provides preliminary but significant information about the standards of diabetes care in Pakistan, and is the first study of this kind to be undertaken in Services Hospital, Lahore. Improving quality of life for diabetics and reducing morbidity and mortality are major health-care Challenges in developing countries, especially in Pakistan as the number of diabetics is on a steep increase. In this study, the patient sample was drawn from Diabetes Management Centre of Services Hospital, Lahore, where it may be expected that patients have access to

higher standards of care than the rest of the country. The relatively small sample size (64 patients) is a limitation to generalize our results to the community, but nevertheless we feel that important information is gathered from this subset, which is fairly typical regarding the type of patients we come across.

Out of 64 people on whom we performed the study , 46 were in the age group 40-60 years (71.9%) 56.3% were females. 23.4% had not received any formal education, 23.4 % had received education up to primary level, 25% up to secondary and 26.6 %

comprised the largest group of graduation and above.52 out of 64 patients were suffering from type 2 diabetes . 78.1 % were well informed about their disease , whereas 73.4% also had significant knowledge about complications. (table-1.1).

CONCLUSION:

The study strongly endorses the need for a vibrant education program to improve patient's knowledge of diabetes. Specialized diabetes educators should be engaged in imparting diabetes education, to supplement the effort of the physician. The result of this study showed that the rate of noncompliance of diabetic patients was high with dietary non-compliance being the highest. Dietitians need to improve their skills and use more effective intervention approaches in providing dietary counseling to patients.

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