Original Research Article

Knowledge, self-care practices and adherence to medical regimen among diabetic patients

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ABSTRACT

Background: The purpose of the study was to assess the knowledge, self-care practices and adherence to medical regimen among diabetes patients.
Methods: A descriptive study was adopted to assess the knowledge, self- care practices and adherence to medical regimen among diabetic patients. A total of 150 diabetic patients were selected on the basis of inclusion criteria by using convenient sampling technique. Data was collected using Sociodemographic proforma, knowledge questionnaire on diabetes, Self-care practice scale and adherence to medical regimen questionnaire.
Results: The findings revealed that out of total 150 participants, 8.7% had good,78.7% had moderately adequate and 12.7% of the participants had poor knowledge regarding diabetes mellitus, whereas regarding self-care practices 36.7% had good, 52.7% had moderate and 10.7% of the participants had poor self-care practice for the management of diabetes mellitus. Majority (78%) participants had good adherence, 13.3 % participants had excellent adherence and only 8.6% participants had poor adherence to medical regimen.
Conclusions: The study concluded that diabetic patients were adhering to medical regimen and had moderate self-care practices and knowledge. Hence it is important to conduct the diabetic health education program campaigns for diabetic patients to improve their knowledge and self-care practices.

Keywords: Knowledge, Self-care practices, Adherence to medical regimen and diabetic patients

INTRODUCTION

Diabetes mellitus is a lifelong condition in which an individual has raised glycemic rate which results when the pancreas is incapable of insulin production or when the human body is unable to use the produced insulin adequately. Diabetes mellitus is one of the main health related problems among the people of all countries, the prevalence of diabetes has raised to a higher level around the globe in the last twenty years.[1]

Globally, the prevalence rate of diabetes has increased among adults from 4.7% in the year 1980 to 8.5% in 2014. The early deaths have increased 5% between 2000 and 2016 due to diabetes. In 2016, 1.6 million deaths occurred only due to diabetes.[2]

The prevalence rate of diabetes is greatly increasing due to the combination of the aging population, expanding obesity and changing ethnic makeup of the population. World health organization (WHO) predicted that the frequency of diabetes will rise from 463 million in the year 2019 to 700 million by the year 2030, making it the 7th leading cause of death.[3]

Studies have exhibited that despite of normal living conditions, diabetic patients are affected by complications

such as stroke, neuropathy, nephropathy, etc. In fact, among adults' diabetes is the root cause of blindness and chronic liver failure. Diabetic patients are 2-4 times at more risk of cardiac diseases than non-diabetic patients. A survey conducted by the WHO revealed that 16% of hospital costs and 58% of all amputations were related to diabetes.[4]

In countries having low and middle income more than 77% of morbidity and 88% mortality occurs from diabetes mellitus. In 2017 out of global population, the number is estimated to rise to 10%.[5]

Nonadherence can take place at various phases during journey of diabetes management. It may consist of complete ignorance of treatment, not filling up prescription, managing dose on their own and not following physician's prescription.[6]

Thus, diabetes is a chronic disorder with no cure, the lack of patient participation in the process of treatment is one of the major reasons for the lack of accomplishment in attaining the desired result for the care of diabetics.[7]

METHODS

Study design

Descriptive research design was adopted in the study. The study period was from December 2020 to September to 2021. The sample for the study included the clients with diabetes mellitus attending medical OPD of Himalayan Hospital. Total 150 samples were taken for the study and were selected by the technique of convenient sampling.

The primary objectives were to assess the knowledge, self-care practices and adherence to medical regimen among diabetic patients.

The study population

The inclusion criteria

Patients who were diagnosed with diabetes for more than 6 months. Patients more than 18 years of age and patients who were on oral and injectable anti-diabetic drugs.

The exclusion criteria

Patients having gestational diabetes. Patients who were not agreeing for the response and patients dependent on care givers for medication.

Sample size and sampling procedure

The sample size for the present study was calculated through prevalence rate of Uttarakhand which was estimated to be 10%.[8]

$$N = Z_1^2 - \alpha/2 P(1-P)/d^2$$

Where Z_1- $\alpha/2$ = 1.96

P=prevalence =10% = 0.10

1-P =1-0.10= 0.9

d=Margin of error=5%

$$N = (1.96)^2 (0.10) (0.9)/ (0.05)^2$$

$$= 138.29 = 138$$

Thus, 150 samples were taken for the study.

Sampling

Convenient sampling technique was used for 150 participants.

Research instruments

Structured pretested questionnaires were used for data collection. The tool comprised of four parts. Part 1 consisted of 16 questions associated with social-demographics characteristics and clinical information of the patients, while part 2 comprised of 31 questions associated with knowledge of diabetes mellitus and part 3 comprised of 24 questions associated with self-care practices and part comprised 8 questions related to medication adherence related to diabetes mellitus.

Pre-testing of instruments

Formal administrative permission was obtained before pre-testing. Hindi version of the tools was administered to 15 participants those having diabetes mellitus for the clarity of tools and to evaluate language understanding. The time required to fill the tools was 15 to 30 minutes.

Data collection

All the participants who fulfilled the inclusion criteria were taken into the study. The data collection was done through questionnaires.

The setting for the main data collection was done in medical OPD, Himalayan hospital, which is located in Jolly Grant, Dehradun. Himalayan hospital serves to the people of various regions and provides integrated and cost-effective health care.

Firstly, eligible participants were identified then the researcher explained the purpose of the study to them and gave them consent form and asked them to read it and requested them to give their consent for participating in the study. After that researcher took him/her aside away from other patients and made the participant feel comfortable and gave them questionnaire to read, understand and requested them to fill their response for

every question in the knowledge questionnaire, self-care practice scale and adherence to medical regimen questionnaire. Participants completed the questionnaire in 15-20 minutes. A code number was allotted to each subject on the basis of their sequence number.

Data analysis

Descriptive statistics were used to summarize data, chi square test tested the relationship among the variables. Coding and processing were done with use of statistical package for social sciences (SPSS) software version 23.

Ethical considerations

To conduct the present study administrative permission was obtained from principal, Himalayan college of Nursing and head of endocrinology department. Ethical permission from ethical committee of SRHU was obtained. Administrative permission was obtained from ethical committee of SRHU and CMO Himalyan Hospital. The written consent was obtained from treating physician and before starting data collection written consent was taken from each participant. Assurance was given to the subjects that the anonymity of each individual will be maintained and the information received will be kept confidential.

RESULT

Patients' characteristics

A total of 150 diabetic patients were taken into the study. Calculation (Table 1) delineates that maximum study participants (30.66%) were in age group of 41-50 years and least (4%) were in age group 71-80 years. Majority of the subjects (61.3%) were females and 38.6% were males. The 27.3% of subjects were graduates and 12% had higher education. Less than half (34.6%) had private jobs and 12.6% had government jobs. 26.6% of subjects were having their monthly income less than Rs. 25,000/- and 14% with monthly income less than Rs.10,000/- Majority of subjects (88%) were married and 12% were widow and 66% had joint family and 34% had nuclear family.

Clinical variable

The maximum study participants (Table 2) (36.66%) had duration of illness from 1-5 years and only 11.3% of the participants had illness from 16-20 years. Majority (76.6%) of them took oral medication for diabetes mellitus however, 19.3% received injections and 4% of participants took both oral as well as injections for the treatment of diabetes mellitus. More than a half of subjects 57.3% had comorbidity where maximum subjects (81%) had cardiac diseases and 9.3% of the subjects suffered from hypothyroidism. The 53.9% had received health education regarding diabetes mellitus out of which 25% received it from health professionals and 21.7% of subjects received from their family members.

More than half of subject (58.6%) had family history of diabetes mellitus and 68.6% had visual problems as complications. On the other hand, 22.6% of the subjects had no complications. Majority of samples (95.3%) reported poor control with HbA1c 7.64 and above and least (4%) of the participants reported fair control in their glucose level with HbA1c 6.81-7.63. Majority of them (94%) didn't opt for Ayurvedic medications, however 6% were taking Ayurvedic medications.

Knowledge regarding diabetes mellitus

There was total 31 questions and each question carried one mark. The range of score obtained by the study participants were 16, median 19 and mean was 19.15 ± 3.16. The questionnaire was distributed in 10 domains, meaning, risk factors, sign and symptoms, test, treatment, complication foot care, diet, exercise and follow-up. The highest mean percentage was regarding meaning (80.55%) of diabetes followed by sign and symptoms (76%), complications of diabetes (65.2%), diet for diabetes (60.75%) and least regarding treatment of diabetes (38%). Participants who scored less than 50% were categorized as has poor knowledge, scores between 51-74% were categorized as having moderate knowledge and scores 75-100% were categorized as good knowledge. According to given categories (Figure 1) among 150 participants 19 participants (12.7%) had poor knowledge, 118 participants (78.7%) had moderate adequate knowledge and 13 (8.7%) had good knowledge.
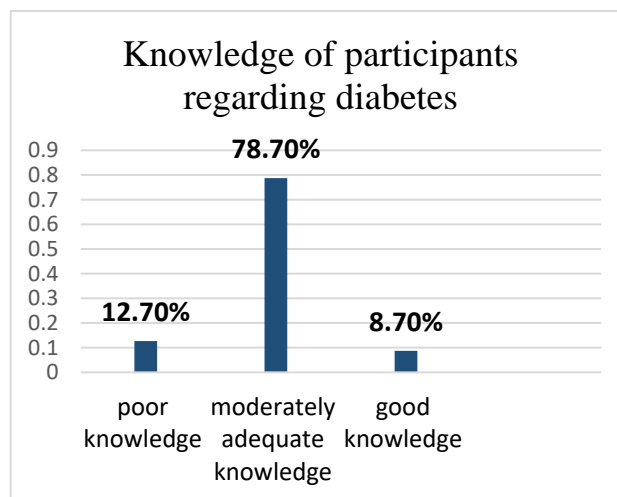
Figure 1: Percentage distribution of study participants related to knowledge of DM.

Self-care practices regarding diabetes mellitus.

Self-care practices were assessed using self-care practice scale. There were total 24 questions with total 72 score and least 24, the range of score obtained by the study participants were 21, median 58 and mean was 58.4 ± 5.7. The questionnaire was divided in 6 domains: diet, exercise, blood glucose monitoring, foot care, stress and dental care. In which diet and foot care has maximum

questions and the mean of the scored marks are 15.45 and 15.57 with mean percentage 85.8% and 86.5% respectively, however other domains such as for blood glucose monitoring the mean was 9.21 and for exercise the mean calculated was 8.65. Whereas stress and dental care were at mini with mean 4.80 and 4.75 respectively. participants who scored below 50 were categorized having poor practice, participants who scores 51-60 were categorized having moderate practice and participants who scored 61 and above were categorized having good practice. According to category given, (Figure 2) out of total 150 participants 16 (10.7%) participants had poor practice, 79 (52.7%) participants had moderate practice and 55 (36.7%) participants had good practice of self-care practice for management of DM.
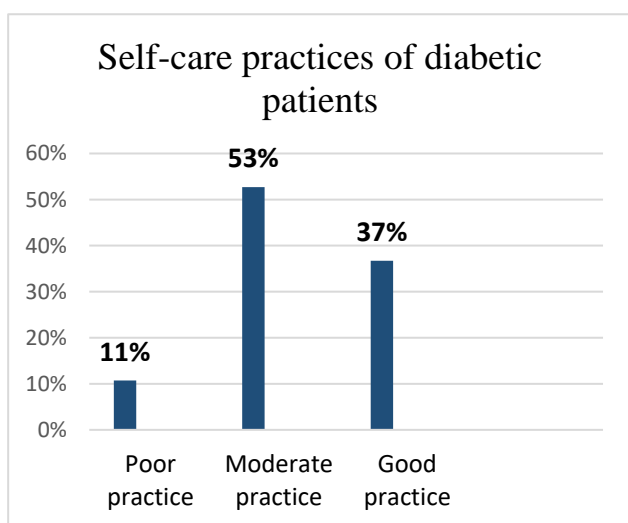
Adherence to medical regimen

Adherence was analysed using questionnaire on adherence to medical regimen questionnaire, there were total 8 questions and each question carried one marks. The calculation revealed that (Figure 3) majority (78%) participants had good adherence, 13.3% participants had excellent adherence and only 8.6% participants had poor level of adherence to medical regimen for DM.

Figure 2: Percentage distribution of self-care practices among diabetic patients.
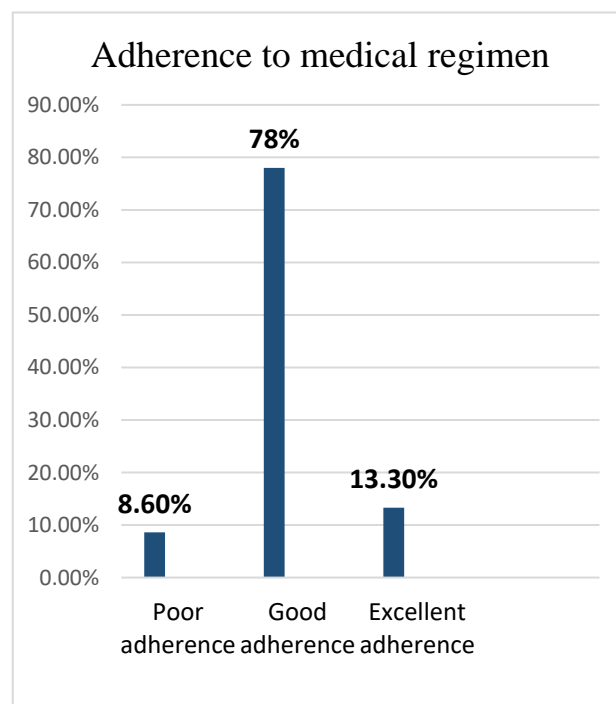
Figure 3: Percentage distribution of medication adherence among diabetic patients.

Table 1: Frequency percentage distribution of sociodemographic characteristics of studying participants, (n=150).

Sociodemographic variable	Frequency	Percentage (%)
Age (years)		
25-45	30	20
46-65	81	54
66-85	39	26
Gender		
Male	58	38.66
Female	92	61.33
Education		
No formal education	21	14
Primary school	29	19.33
Secondary school	14	9.33
Higher school	27	18
Graduated	41	27.33
Above	18	12
Occupation		
Government job	19	12.66
Private job	52	34.66
House maker	66	44
Pensioner	13	8.66

Continued.

Sociodemographic variable	Frequency	Percentage (%)
Family income (Rs)		
5,000- 10,000/-	21	14
11,000-25,000/-	40	26.66
26,000-55,000/-	51	34
More than 60,000/-	38	25.33
Marital status		
Married	132	88
Widow	18	12
Type of family		
Nuclear family	51	34
Joint family	99	66
Residence area		
Urban	58	38.66
Semi urban	22	14.66
Rural	70	46.66

Table 2: Frequency and percentage distribution of clinical characteristics of study participants, (n=150).

Clinical variable	Frequency	Percentage (%)
Duration of illness (years)		
1-5	55	36.66
6-10	45	30
11-15	33	22
16-20	17	11.33
Route of medication		
Oral	115	76.6
Injection	29	19.33
Both	6	4
If co-morbidity present in diabetic patients		
Yes	64	42.66
No	86	57.33
Any other diseases condition present		
Cardiac diseases	52	81.2
Hypothyroidism	6	9.3
Depression	1	1.56
Slip disc	1	1.56
Chronic liver disease	2	3.12
Cholelithiasis	1	1.56
Breast cancer	1	1.56
Health education taken for diabetes mellitus		
Yes	82	53.9
No	68	44.7
Source of health education		
Health personnel	38	25
Friends	7	4.6
Internet	4	2.6
Family members	33	21.7
Any family history of diabetes mellitus		
Yes	62	41.33
No	88	58.66
Any complications present due to diabetes mellitus		
No complications	34	22.66
Cardiovascular disorders	7	4.66
Renal disease	4	2.66
Diabetic foot	1	0.66
Visual problems	103	68.66
Others	1	0.66

Continued.

Clinical variable	Frequency	Percentage (%)
HbA1c value		
4.30-5.96 (non-diabetic)	0	
5.97-6.80 (good control)	1	0.66
6.81-7.63 (fair control)	6	4
7.64 and above (poor control)	143	95.33
Use of ayurvedic medications		
Yes	9	6
No	141	94

DISCUSSION

In the present study 30.66% participants were in the age group of 41-50 years and the least (4%) were in the age group 71-80 years. Majority of the subjects (61.3%) were females and 38.6% were males. 27.3% of subjects were graduates and 12% had higher education. Less than half (34.6%) had private jobs and 12.6% had government jobs. 26.6% of subjects were having their monthly income less than Rs.25,000/- and 14% were with monthly income less than Rs.10,000/- Majority of the subjects (88%) were married and 12% were widow and 66% had joint family and 34% had nuclear family.

For clinical variables, study participants (36.66%) had duration of illness from 1-5 years and only 11.3% of the participants had illness from 16-20 years. Majority (76.6%) of them took oral medication for diabetes mellitus however, 19.3% received injections and 4% of participants took both oral as well as injections for the treatment of diabetes mellitus. More than a half of subjects 57.3% had comorbidity where maximum subjects (81%) had cardiac diseases. 53.9% had received health education regarding diabetes mellitus out of which 25% received it from health professionals and 21.7% of the subjects received from their family members. More than half of subject (58.6%) had family history of diabetes mellitus and 68.6% had visual problems as complications. Majority of samples (95.3%) reported poor control with HbA1c. Majority of them (94%) did not opt for ayurvedic medications, however 6% were taking ayurvedic medications.

The result revealed that out of 150 participant 8.7% (13) had good, 78.7% (118) had moderate adequate and 12.7% (19) of the participants had poor knowledge regarding diabetes mellitus. Maximum participants had moderate adequate knowledge regarding diabetes mellitus this might be due to their regularity in follow up visit every 15 days or after 3 months. On their every visit they were explained about the diabetes mellitus and its complications. A study conducted by Nagar et al the sample size of the study was 150 out of which 16% had good, 34.6% had poor and 49.3% had moderate knowledge related to diabetes.[9]

Self-care practice was assessed and the study revealed that out of total 150 samples 36.7% (55) had good, 52.7% (79) had moderate and 10.7% (16) of the participants had poor self-care practice for the management of the DM.

Majority of the participants had moderate self-care practice regarding management of diabetes this might be due to their regular follow up and the instructions given by the physician on their visits regarding keeping of records about glucose monitoring, diet and importance of exercises on daily basis. However, there is still a need of reinforcement regarding importance of self-care practices to maintain normal glucose level and prevention of complications. Results were similar to study conducted by Karthik et al out of 250 participants, 5.6% had good self-care, 42% had moderate self-care and 52% had very poor self-care.[10]

In medication adherence, the outcome of the study revealed that out of total 150 samples majority 78% (117) participants had good adherence, 13.3% (20) participants had excellent adherence and only 8.6% (13) participants had poor level of adherence to medical regimen for diabetes mellitus. Srividya et al to assess adherence to medication among adults with diabetes mellitus of total 150 participants. Eight item Scale was used for assessing adherence and was categorized as high adherence-8 score, moderate adherence 6-7 score and low adherence-scores<6 thus, the results showed that 16.6% had high medical adherence, 60.6% had moderate medication adherence and 22.6% had low medical adherence.[11]

Significant association was demonstrated (Table 3) between knowledge scores gender (p=0.012) of study participants. This reveals that variables such as age, occupation, marital status etc. were not associated with knowledge score regarding diabetes mellitus. Consistent finding was obtained in a study done by Fatema K the study showed significant association between education, occupation and socioeconomic status (p<0.05), and however significant association was not seen with reference to age and gender (p<0.05).[12]

No significant association between demographic variables and self-care practices (Table 4) was found among diabetic patients. This reveals that sociodemographic variables such as age, gender, education etc. were not associated with self-care practices of diabetic patients. Another study conducted by Goyal et al the results revealed that age and place of residence were significantly associated with self-care practices of diabetes mellitus however, other variables such as gender, status of marriage, education, occupation, income of a month, family type, food habits, duration of diabetes and family history of diabetes did not find any association

towards self-care of diabetes mellitus.[13]

Significant association was found (Table 5) with medication adherence family income (p=0.039) due to regularity in purchasing medication and avoidance in skipping medication. However other variables were not significantly associated. Alrahbeni et al conducted a study to assess adherence to diabetes medication among diabetic patients. There was significant association between occupational status and level of adherence (p=0.037).[14]

In the study, positive correlation was noted between knowledge and self-care practice among diabetic patients (Table 6) with r=0.061, p=0.45. Consistent finding was

found in a study conducted by Ghannadi et al the results revealed that all the variables had positive correlation such as diet with r=0.022 significant at 0.0814 level, exercise r=0.217 significant at 0.019, blood glucose monitoring r value of =0.269 significant at 0.003 level and foot care r value of =0.265 significant at 0.004 level.[15]

The study found positive significant correlation between knowledge score and medication adherence score among diabetic patients as shown in the Table 6 with r value of =0.163 significant at 0.046 level. A study was conducted by Nazir et al significant weak positive correlation was found diabetes mellitus knowledge and medication adherence with r value of =0.036 significant at the 0.05 level.[16]

Table 3: Association between knowledge and demographic variable, (n=150).

Level of knowledge among diabetic patients	Poor knowledge, n (%)	Moderately adequate knowledge, n (%)	Good knowledge, n (%)	χ^2	Df	P value
Age in years						
30-50	10 (13.2)	61 (80.3)	5 (6.6)	0.854	2	0.652
51-80	9 (12.2)	57 (77.0)	8 (10.8)			
Gender						
Male	6 (10.3)	42 (72.4)	10 (17.2)	8.895	2	0.012*
Female	13 (14.1)	76 (82.6)	3 (3.3)			
Education						
No formal education	2 (9.5)	19 (90.5)	0	2.740	2	0.254
Formal education	17 (13.2)	99 (76.7)	13 (10.1)			
Occupation						
Working	11 (15.5)	54 (76.1)	6 (8.5)	0.974	2	0.614
Non-working	8 (10.1)	64 (81)	7 (8.9)			
Family income (Rs)						
5000-25,000	7 (11.5)	51 (83.6)	3 (4.9)	2.101	2	0.350
26,000-60,000	12 (13.5)	67 (75.3)	10 (11.2)			
Marital status						
Married	15 (11.4)	104 (78.8)	13 (9.8)	3.249	2	0.197
widow	4 (22.2)	14 (77.8)	0			
Type of family						
Nuclear family	8 (15.7)	40 (78.4)	3 (5.9)	1.248	2	0.536
Joint family	11 (11.1)	78 (78.8)	10 (10.1)			
Residence area						
Urban	7 (12.1)	43 (74.1)	8 (13.8)	3.661	4	0.454
Semi urban	3 (13.6)	17 (77.3)	2 (9.1)			
Rural	9 (12.9)	58 (82.9)	3 (4.3)			

*Significant at p<0.05

Table 4: Association between self-care practices and demographic variable, (n=150).

Level of knowledge among diabetic patients	Poor self-care practice, n (%)	Moderate self-care practice, n (%)	Good self-care practice, n (%)	χ^2	Df	P value
Age (Years)						
30-50	8 (10.5)	40 (52.6)	28 (36.8)	0.004	2	0.998
51-80	8 (10.8)	39 (52.7)	27 (36.5)			
Gender						
Male	6 (103)	30 (51.7)	22 (37.9)	0.066	2	0.967
Female	10 (10.9)	49 (53.3)	33 (35.9)			

Continued.

Level of knowledge among diabetic patients	Poor self-care practice, n (%)	Moderate self-care practice, n (%)	Good self-care practice, n (%)	χ2	Df	P value
Education						
No formal education	1 (4.8)	11 (52.4)	9 (42.9)	1.054	2	0.590
Formal education	15 (11.6)	68 (52.7)	46 (35.7)			
Occupation						
Working	9 (12.7)	39 (54.9)	23 (32.4)	1.312	2	0.519
Non-working	7 (8.9)	40 (50.6)	32 (40.5)			
Family income (Rs)						
5000-25,000	6 (9.8)	34 (55.7)	21 (34.4)	0.391	2	0.822
26,000-60,000	10 (11.2)	45 (50.6)	34 (38.2)			
Marital status						
Married	14 (10.6)	66 (50)	52 (39.4)	3.72	2	0.156
Widow	2 (11.1)	13 (72.2)	3 (16.7)			
Type of family						
Nuclear family	8 (15.7)	23 (45.1)	20 (39.2)	2.803	2	0.246
Joint family	8 (8.1)	56 (56.6)	35 (35.4)			
Residence area						
Urban	7 (12.1)	26 (44.8)	25 (43.1)	2.376	4	0.667
Semi urban	2 (9.1)	13 (59.1)	7 (31.8)			
Rural	7 (10.0)	40 (57.1)	23 (32.9)			

Table 5: Association between medical adherence and demographic variable, (n=150).

Level of knowledge among diabetic patients	Poor medication adherence, n (%)	Good medication adherence, n (%)	Excellent medication adherence, n (%)	χ2	Df	P value
Age in (Years)						
30-50	3 (3.9)	62 (81.6)	11 (14.5)	4.36	2	0.113
51-80	10 (13.5)	55 (74.3)	9 (12.2)			
Gender						
Male	6 (10.3)	42 (72.4)	10 (17.2)	1.76	2	0.413
Female	7 (7.6)	75 (81.5)	10 (10.9)			
Education						
No formal education	0	19 (90.5)	2 (9.5)	2.86	2	0.23
Formal education	13(10.1%)	98 (76)	18 (14)			
Occupation						
Working	10 (1401)	51 (71.8)	10 (14.1)	5.280	2	0.07
Non-working	3 (3.8)	66 (83.5)	10 (12.7)			
Family income (Rs)						
5000-25,000/-	9 (14.8)	47 (77)	5 (8.2)	6.44	2	0.039*
26,000-60,000	4 (4.5)	70 (78.7)	15 (16.9)			
Marital status						
Married	11 (8.3)	104 (78.8)	17 (12.9)	0.399	2	0.819
widow	2 (11.1)	13 (72.2)	3 (16.7)			
Type of family						
Nuclear family	7 (13.7)	34 (66.7)	10 (19.6)	5.83	2	0.05
Joint family	6 (6.1)	83 (83.8)	10 (10.1)			
Residence area						
Urban	1 (1.7)	48 (82.8)	9 (15.5)	9.35	4	0.0529
Semi urban	5 (22.7)	15 (68.2)	2 (9.1)			
Rural	7 (10)	54 (77.1)	9 (12.9)			

*Significant at p<0.05

Table 6: Correlation between knowledge and self-care practices and medication adherence among diabetes patients.

Correlation between	R value	P value
Knowledge and self-care practices among diabetes patients	0.061	0.45
Knowledge and medication adherence among diabetes patients	0.163	0.046

Limitations

Self-care practices were assessed as reported by the patients thus could not be observed and convenient sampling was used in order to complete the sample size.

CONCLUSION

The present study is focused to assess knowledge, self-care practices and adherence to medical regimen among diabetic patients.

As per the findings, it was concluded that maximum participants had average knowledge, majority of the participants had good self-care practice and with regards to adherence to medical regimen majority of the participants had intermediate adherence.

In order to increase the knowledge, regular health education can be conducted for the patients attending OPD and regular sessions can be conducted in the hospital to increase the number of the participants having good knowledge and self-care practices.

Recommendations

Nurses working in hospitals or in community areas can give small talks and provide information regarding the management and self-care practices which all the diabetic patients can adopt in their daily day to day life. More specifically, all the nursing personnel working in hospital must be made aware about the management of diabetes mellitus, such as dietary modification, performance of exercise to control blood glucose level. Also, pamphlets, handouts or booklets can be given to the patients regarding the management of diabetes mellitus as they visit the OPD.

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