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A Study to Assess the Knowledge of Diabetes Mellitus among Diabetic Patients and Their Awareness about Diabetic Diet

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I. Introduction

BACKGROUND OF THE STUDY

According to **W.H.O.** health is defined as, "the state of complete physical, mental, social and spiritual wellbeing and not merely absence of disease or infirmity". But in diabetes mellitus all these aspects of health are severely affected. The patient is not only compromised regarding physical health but also he faces the mental stress and his social life also gets affected. Moreover if diabetes mellitus not promptly treated it may lead to severe complications. This puts lot of economic burden on the health care delivery system as well as the individual himself.

- In United States diabetes is the leading cause of non traumatic amputations, blindness in the working age adults and end stage renal diseases **(U.S. Public Health Service, 2000).**
- Diabetes is the third leading cause of death from disease, primarily because of the high rate of cardiovascular disease among people with diabetes mellitus.
- Hospitalization rates for people with diabetes are 2.4 times greater for adults and 5.3 times greater for children than for general population.
- According to **Zhang, Engel au, Norris et al., 2004,** the economic cost of diabetes mellitus continues to increase because of increasing health care costs and an aging population. Half of all people who have diabetes and are older than 65 years of age are hospitalized each year, and severe life-threatening complications often contribute to the increased rate of hospitalization. Costs related to diabetes are estimated to be almost $132 billion annually, including direct medical care expenses and indirect costs attributable to disability and premature death. It is estimated that these costs will increase to $156 billion by 2010 and to $192 billion by 2020.

NEED FOR THE STUDY

(Udayavani 2004)., Diabetes is one of the incurables but easily controllable diseases. At present there are 19.4 crore diabetic patients world wide, out of these 3.5 crore are in India. **W.H.O.** declared that India is the capital city of diabetes mellitus. **(Times of India 2002).**, reported that one among nine diabetic patients in the world is an Indian It is a chronic disease due to the impaired balance between glucose and insulin in the body. Improper dietary management is one of the common reasons for uncontrolled diabetes and occurrence of complication. These complications cause major morbidity and mortality in patients with diabetes mellitus.

Dietary management is simple and inexpensive method to control diabetes mellitus. According to **black** and **Joyce 2007** nutritional assessment and client understanding that optimal nutrition can lead to reduction of risk factors for chronic health problems and improve overall health constitute the starting point for the goal selection in treatment. According to **Staci Nix 2005**., every person with diabetes is unique having not only a particular form and degree of diabetes but also different living situation, background and food habits. All of these personnel needs must be considered if appropriate and realistic care is to be planned. Various studies have been conducted regarding the dietary management in diabetes but many diabetic patients are still ignorant about the implementation of these recommendations. That's why the study is needed.

OPERATIONAL DEFINITION

- **Effectiveness:** producing an intended result.
- **Knowledge:** information or awareness gained through planned teaching.
- **Management:** act of managing the diabetes.
- **Selected hospital:** Acharya Vinoba Bhave Rural Hospital, Sawangi (Meghe), Wardha.

AIMS AND OBJECTIVES

- To assess the existing knowledge of the diabetic patients regarding the diet.
- To assess the awareness about diabetic diet in diabetic mellitus patients.
- To assess compliance of patients for medication of diabetes mellitus patients.
- To associate the knowledge with demographic variables.

II. Material And Methods

STUDY SETTING

Acharya Vinoba Bhave Rural Hospital, Sawangi (Meghe), Wardha.

STUDY PARTICIPANTS
Diagnosed patients coming for treatment in OPD and admitted in IPD.
SAMPLING TECHNIQUE
Convenient sampling is the search and of the most reality available people or object as participants in study (**Talbot LA 1995**). Convenient sampling technique was used to select the samples for present study, diagnosed patients coming for treatment in OPD and admitted in IPD.
CRITERIA FOR INCLUSION IN STUDY
Patients who are:
- Suffering from diabetes mellitus.
- Available during data collection period.
- Willing to participate in study.

METHOD OF DATA COLLECTION
Structured questionnaire was used to collect data required for the study.
TOOL
A structured questionnaire consisting 35 items was used to collect the data. Structured questionnaire was prepared by referring books, journals and as per the guidance of the guide.
DISCRIPTION OF TOOL
The structured questionnaire consists of 3 sections.
- Section A includes the demographic data of patients.
- Section B includes knowledge of patients regarding definition.
- Section C includes knowledge of patients regarding causes of diabetes mellitus.
- Section D includes knowledge of patients regarding sign and symptoms of DM.
- Section E includes knowledge of patients regarding medication of DM.
- Section F includes knowledge of patients regarding dietary modification in DM.
- Section G includes knowledge of patients regarding complications.

There are 35 questions regarding knowledge about diabetes mellitus
- Definition – 3 items
- Causes – 4 items
- Sign and symptoms – 5 items
- Medications – 2 items
- Dietary management – 10 items
- Complications-5 items

SCORING
- Score 1 was given to every correct answer.
- Score 0 was given to every wrong answer.

STATISTICAL ANALYSIS
Statistical analysis was done by using bar diagram, pie diagram, descriptive and inferential statistics. Analysis was done by using statistical software SPSS version 14.0 and Microsoft Excel.

III. Observations And Results

This chapter deals with analysis and interpretation of the data collected for this study. Analysis and interpretation were done based on objectives of the study. The data was analyzed and is presented in the following sections.
Section I: Distribution of diabetes patients in relation to demographic data.
Section II: Distribution of diabetes patients with regard to General Assessment.
Section III: Significant differences of knowledge score regarding knowledge of Diabetes Mellitus.
Section IV: Distribution of diabetes patients in relation to knowledge of Diabetes Mellitus.
Section V: Comparison of significance of difference between knowledge score in relation to demographic variable.

SECTION I: DISTRIBUTION OF DIABETES PATIENTS IN RELATION TO THEIR DEMOGRAPHIC VARIABLES

Table 1: Percentage wise distribution of diabetes patients according to their demographic characteristics. (n=150)

Demographic Variables	No. of patients	Percentage (%)
Age(yrs)		
31-40	48	32.00
41-50	54	36.00
51-60	36	24.00
61-70	12	8.00
Sex		
Male	75	50.00
Female	75	50.00
Residence		
Rural	90	60.00
Urban	60	40.00

Number of members in the family		
2	12	8.00
3	30	20.00
4	54	36.00
4+	54	36.00
Educational Qualification		
Illiterate	44	29.33
Upto Primary	27	18.00
Secondary	25	16.67
Graduate	30	20.00
Professional	24	16.00
Occupation		
Sedentary	30	20.00
Private	33	22.00
Government	42	28.00
Business	45	30.00
Lifestyle		
Sedentary	66	46.00
Strenuous Activity	69	44.00
Others	15	10.00

Majority of diabetes patients belongs to age group 41-50 years (46%) whereas 32% belongs to age group 31-40 years. Male and females were equal in numbers (50%), majority of diabetes patients resides in rural areas (60%), majority of them are illiterate (29.33%), 44% of diabetes patients have their life style as strenuous activity, and 46% sedentary.

Figure 1: Percentage wise distribution of diabetes patients according to their age.

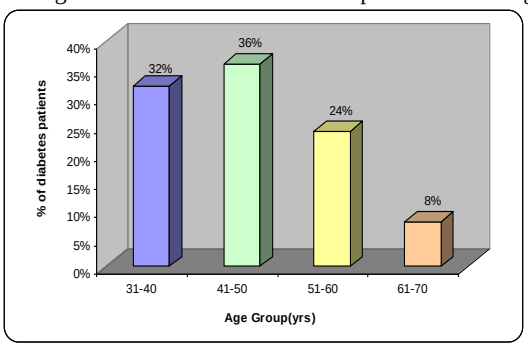


Figure 2: Percentage wise distribution of diabetes patients according to their gender.

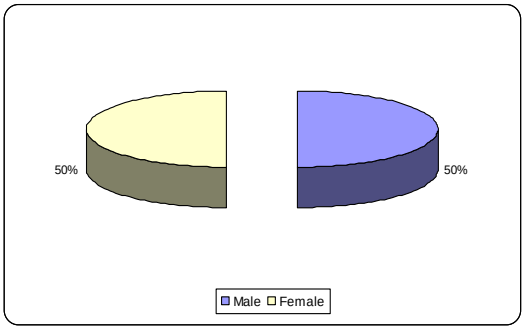


Figure 3: Percentage wise distribution of diabetes patients according to their residence.

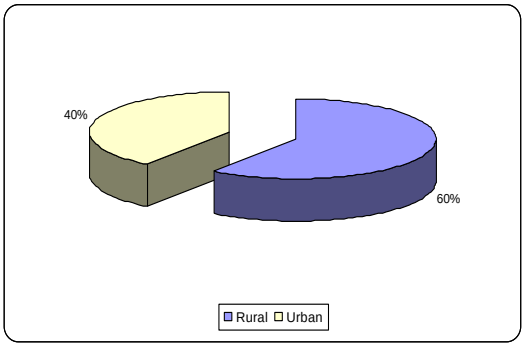


Figure 4: Percentage wise distribution of diabetes patients according to number of children in the family.

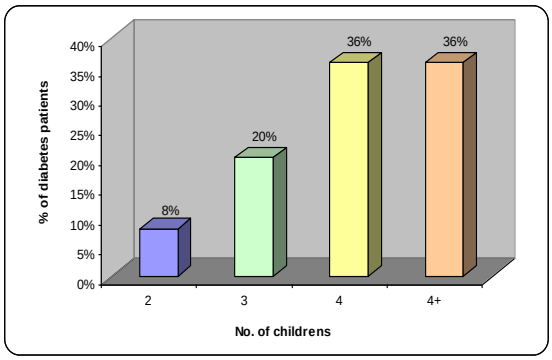


Figure 5: Percentage wise distribution of diabetes patients according to educational qualification.

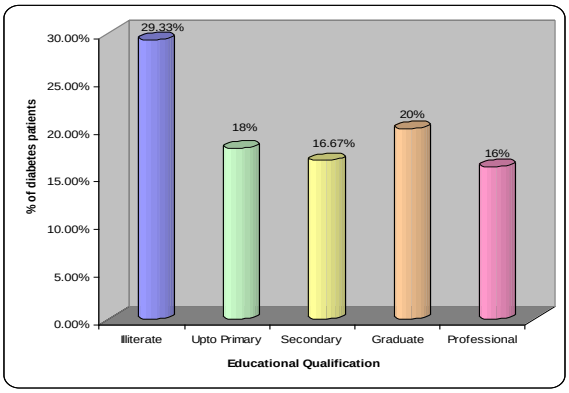


Figure 6: Percentage wise distribution of diabetes patients according to occupation.

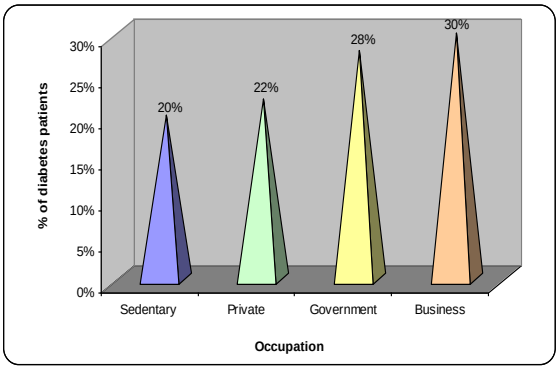
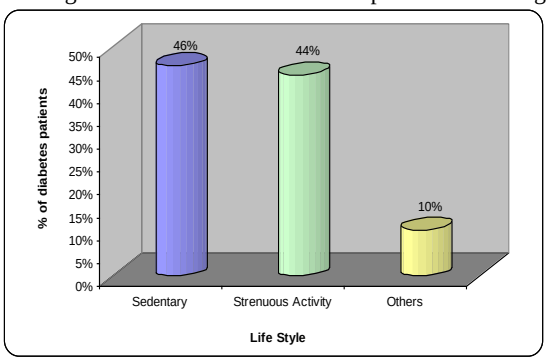


Figure 7: Percentage wise distribution of diabetes patients according to life style.



SECTION II: DISTRIBUTION OF DIABETES MELLITUS PATIENTS WITH REGARD TO GENERAL ASSESSMENT.

Table 2: Distribution of diabetes patients with regards to general assessment. (n=150)

LEVEL OF KNOWLEDGE SCORE	Poor	Average	Good	Excellent
Definition	27(18%)	81(54%)	30(20%)	12(8%)
Causes	48(32%)	54(36%)	21(14%)	27(18%)
Sign and Symptoms	24(16%)	51(34%)	30(20%)	45(30%)
Medications	54(36%)	54(36%)	30(20%)	12(8%)
Dietary Management	51(34%)	78(52%)	21(14%)	0(0%)
Complications	48(32%)	69(46%)	18(12%)	15(10%)
Overall	15(10%)	117(78%)	15(10%)	3(2%)

8% of diabetes patients had excellent knowledge about definition of diabetes. 18% of diabetes patients had excellent knowledge in relation to the area causes of diabetes. 30% diabetes patients had excellent knowledge in relation to the area sign and symptoms. 8% of diabetes patients had excellent knowledge in relation the area medications. None of the diabetes patients had excellent knowledge in relation to the area dietary management. 10% of diabetes patients had excellent knowledge in relation to the area on complications and overall 2% of diabetes patients had excellent knowledge in relation to diabetes. Hence it is proved that overall knowledge about diabetes mellitus is less among the diabetic patients.

SECTION III: SIGNIFICANT DIFFERENCE OF KNOWLEDGE SCORE REGARDING DIABETES MELLITUS BEFORE

This section deals with the analysis of data to determine the significance of difference in knowledge score of the diabetes patients.

Table 3: Significance of difference between knowledge score in relation to definition of diabetes. (n=150)

Area	Maximum score	Mean	Standard deviation	Mean percentage
Definition	3	1.18	0.82	39.33

The mean knowledge score of diabetic patients in relation to the area definition of diabetes is 1.18 ± 0.82 which is 39.33% of total score.

Table 4: Significance of difference between knowledge score in relation to causes of diabetes (n=150)

Area	Maximum score	Mean	Standard deviation	Mean percentage
Causes of diabetes	4	2.16	1.18	43.20

The mean knowledge score of diabetic patients in relation to the area causes of diabetes is 2.16 ± 1.18 which is 43.20% of total score.

Table 5: Significance of difference between knowledge score in relation to sign and symptoms. (n=150)

Area	Maximum score	Mean	Standard deviation	Mean percentage
Sign and Symptoms	5	2.66	1.11	53.20

The mean knowledge score of diabetic patients in relation to the area sign and symptoms is 2.66 ± 1.11 which is 53.20% of total score.

Table 6: Significance of difference between knowledge score in relation to medications. (n=150)

Area	Maximum score	Mean	Standard deviation	Mean percentage
Medications	2	1.23	0.94	43.33

The mean knowledge score of diabetic patients in relation to the area medications is 1.23 ± 0.94 which is 43.33% of total score.

Table 7: Significance of difference between knowledge score in relation to dietary management. (n=150)

Area	Maximum score	Mean	Standard deviation	Mean percentage
Dietary Management	10	4.58	2.16	32.71

The mean knowledge score of diabetic patients in relation to the area dietary management is 4.58 ± 2.16 which is 32.71% of total score.

Table 8: Significance of difference between knowledge score in relation to complications. (n=150)

Area	Maximum score	Mean	Standard deviation	Mean percentage
Complications	5	3.23	1.23	33.33

The mean knowledge score of diabetic patients in relation to the area complications is 3.23 ± 1.23 which is 33.33% of total score.

Table 9: Significance of difference between knowledge score in relation to overall knowledge of diabetes. (n=150)

Overall	Maximum score	Mean	Standard deviation	Mean percentage
Overall Knowledge	29	12.58	3.69	38.12

The mean overall knowledge score of diabetic patients is 12.58 ± 3.69 which is 38.12% of total score.

SECTION IV: DISTRIBUTION OF PATIENTS IN RELATION TO KNOWLEDGE OF DIABETES

Table 10: Distribution of diabetic patients with regard to their Knowledge about definition of diabetes. (n=150)

SN	Knowledge Area	Correct Response	
		F	%
1	Excessive amount of blood glucose level due to insufficient production of insulin or alteration in its function is known as diabetes mellitus?	84	56
2	Diabetes mellitus is communicable disease?	63	42
3	Carbohydrate metabolism is normal in diabetes mellitus?	30	20

Table 10 deals with distribution of the diabetic patients with regards to definition of diabetes. 56% of the diabetes patients had knowledge about "Excessive amount of blood glucose level due to insufficient production of insulin or alteration in its function is known as diabetes mellitus? ". Knowledge about "Diabetes mellitus is communicable disease?" was given by 42% diabetic patients. 20% of diabetes patients had knowledge about "Carbohydrate metabolism is normal in diabetes mellitus?"

Table 11: Distribution of diabetes patients with regard to causes of diabetes. (n=150)

SN	Knowledge Area	Correct Response	
		F	%
1	Are you having any family history of diabetes mellitus?	99	66
2	Obesity is a risk factor for diabetes mellitus?	45	30
3	Does excessive intake of sugar by a normal person cause diabetes mellitus?	60	40
4	Mental stress is a risk factor for diabetes mellitus?	45	30

Table 11 deals with distribution of the diabetes patients with regards to causes of diabetes. 66% of the diabetes patients had knowledge about diabetes. Are you having any family history of diabetes mellitus?" Knowledge about "Obesity is a risk factor for diabetes mellitus?" was 30.00%. 40% of diabetes patients had knowledge about "Does excessive intake of sugar by a normal person cause diabetes mellitus? ". 30% of diabetes patients had knowledge about "Mental stress is a risk factor for diabetes mellitus? ".

Table 12: Distribution of diabetes patients with regard sign and symptoms. (n=150)

SN	Knowledge Area	Correct Response	
		F	%
1	Do you know the importance of eye checkup in DM?	60	40
2	Are polyurea, polyphagia and polydipsia the cardinal sings of diabetes mellitus?	84	56
3	There is excessive weight loss in diabetes mellitus?	48	32
4	Can there be sudden fall in the blood sugar level to cause fainting in diabetes mellitus?	72	48
5	There is a feeling of numbness and tingling sensation in diabetes mellitus?	75	50

Table 12 deals with distribution of the diabetes patients with regards to sign and symptoms. 40% of the diabetic patients had knowledge about "Importance of eye checkup in DM", 56% of the diabetes patients had knowledge about "Are polyurea, polyphagia and polydipsia the cardinal sings of diabetes mellitus?". Knowledge about "There is excessive weight loss in diabetes mellitus?"was 32%. 48% of diabetes patients had knowledge about "Can there be sudden fall in the blood sugar level to cause fainting in diabetes mellitus? ". 50% of diabetes patients had knowledge about "There is a feeling of numbness and tingling sensation in diabetes mellitus?

Table 13: Distribution of patients with regard to medication. (n=150)

SN	Knowledge Area	Correct Response	
		F	%
1	Diabetes mellitus is totally curable?	72	48
2	Should the treatment for diabetes mellitus be continued for life long?	54	36

Table 13 deals with distribution of the diabetic patients with regards to medication. 48% of the diabetes patients had knowledge about "Diabetes mellitus is totally curable?"

Knowledge about "Should the treatment for diabetes mellitus be continued for life long?" was 36%.

Table 14: Distribution of patients with regard to dietary management (n=150)

SN	Knowledge Area	Correct Response	
		F	%
1	Should high fiber diet be taken in diabetes mellitus?	30	20
2	Does bitter gourd juice and neem juice cure diabetes completely?	42	28
3	Excessive intake of fat/oils is harmful in diabetes mellitus?	84	56
4	Should small and frequent diet be taken in diabetes mellitus?	54	36
5	Breakfast is very essential in diabetes mellitus?	36	24
6	There is need to consult a professional for the dietary modifications?	30	20
7	Eating more sweets is harmful for diabetes patient?	42	28
8	Can a diabetes patient observe fasts?	69	46
9	Do you consider dietary modification as an important component in the management of DM?	42	28
10	Brisk walking is helpful in diabetes mellitus?	42	28

Table 14 deals with distribution of the diabetic patients with regards to dietary management. 20% of the diabetes patients had knowledge about "Should high fiber diet be taken in diabetes mellitus?"

Knowledge about "Does bitter gourd juice and neem juice cure diabetes completely" was 28%, 56% of the diabetes patients had knowledge about " Excessive intake of fat/oils is harmful in diabetes mellitus", 36% people consider small and frequent diet is important in DM, 24% patients consider breakfast as essential in DM, 20% patients consider need to consult professional for dietary modification, 46% patients has knowledge about fast in DM, 28% patients consider dietary modification as a important management in DM and knows brisk walking is helpful in DM.

Table 15: Distribution of patients with regard to complications. (n=150)

SN	Knowledge Area	Correct Response	
		F	%
1	Do you check your blood sugar levels regularly?	66	44
2	Do you go for yearly eye checkup?	45	30
3	Foot care is an important part of diabetic management?	54	36
4	Are diabetic neuropathy, retinopathy, nephropathy the complications of diabetes mellitus?	51	34
5	Does meditation and yoga help in controlling blood glucose level?	45	30

Table 15 deals with distribution of the diabetes patients with regards to complications.44% patients consider checking of blood sugar level as important in DM, 30% patients goes for yearly eye checkup in DM, 36% of the diabetes patients had knowledge about "Foot care is an important part of diabetic management?", Knowledge about "Are diabetic neuropathy, retinopathy, nephropathy the complications of diabetes mellitus?" was 34% and 30% patients had knowledge about "Does meditation and yoga help in controlling blood glucose level".

SECTION V: COMPARISON OF SIGNIFICANCE OF DIFFERENCE BETWEEN KNOWLEDGE SCORE IN RELATION TO
DEMOGRAPHIC VARIABLE.

This section deals with significance of difference of posttest knowledge in relation to their age, residence, number of members in the family, qualification, occupation and life style.

Table 16: Significance of difference on knowledge of diabetes in relation to lifestyle. (n=150)

Lifestyle	No. of mothers	knowledge Score	F-value	p-value
Sedentary	66	13.54±3.94	1.72	0.19 NS,p>0.05
Strenuous Activity	69	12.08±3.07		
Moderate	15	1.60±3.72		

No significant difference is found in the knowledge about diabetes in relation to lifestyle (F=1.72, p-value=0.19).

IV. Discussion

The patients' knowledge was assessed along with their practices and it suggested that education for diabetic patients is in dire need of improvement.

B. Raaeid and A/H.A. Kablan in their study Profile of diabetes health care at Benghazi Diabetes Centre, Libyan Arab Jamahiriya (2DD7) revealed non-compliant treatment (27.196 of patients reported n at taking their treatment regularly) was much higher than among Egyptians (11%) [4), this means that these patients face greater risk of developing diabetes complications.

In our study 64a of patients are noncompliant about the treatment of diabetes mellitus and do not consider the treatment for diabetes mellitus for life long period.

37.8% of our diabetic patients did not know the symptoms of hypo glycaemia. This is higher than a survey of Omani diabetics (24%) [20j, but lower than among Saudi diabetics (50%) [6). An important finding in this study is that 41.4% of our patients did not know h ow to treat hypo glycaemia. More than 50% of the patients in our study had a history of hypo glycaemia, and this may explain the finding that among patients admitted with hypo glycaemia to a teaching hospital in Benghazi, diabetes was the reason for 40% of the cases [Roaeid RBM, personal communication).

In our study 52% patients didn't know about the occurrence of hypo glycaemia attack in diabetes mellitus and was totally unaware about that and 75% of patients didn't carry sugar cubes with them.

B. Raaeid and A/H.A. Kablan in their study Profile of diabetes health care at Benghazi Diabetes Centre, Libyan Arab Jamahiriya (2DD7) showed that physical exercise is an integral component in the management of diabetes, and yet only 334 (41.5%) of the studied group practice regular physical exercise. However, this is much higher than 31% among African—Americans. In our study 28% of patients knows that regular exercise and walking is helpful in diabetes mellitus by decreasing insulin resistance that means 72% patients even don't know about exercise and walking as a management part of diabetes mellitus. B. Raaeid and A/H.A. Kablan in their study Profile of diabetes health care at Benghazi Diabetes Centre, Libyan Arab Jamahiriya (20D7) showed that of the diabetic patients in the study 214 (26.6%) patients did not know the ophthalmic complications of diabetes, comparable to 21.5%nfrom Australia. The other finding is that 36.6% diabetic patients had had no fundus examination for over 1 year, and 114 (14.2%) had never had a fundus examination. Thus in the year before the study, only 49.2% of the patients had fundus examination ; this is comparable to 49% shown by Brechner et al., but lower than 62% from Egypt, 63.3% from United States \18), 65% from Kansas in the USA [13] and 77% from Australia. Of all the diabetic patients in this study, 40.6% did not know the serious renal complications of diabetes. Diabetes is a leading cause of end -stage renal disease, and among Libyan diabetic patients 30.5% were found to have diabetic nephropathy. Of the diabetic patients in this study, 40.6% did not know the serious effects of diabetes on the kidney.

In our study distribution of the diabetes patients with regards to complications.44% patients consider checking of blood sugar level as important in DM, 3D% patients goes for yearly eye checkup in DM, 36% of the diabetes patients had knowledge about "Foot care is an important part of diabetic management". Knowledge that "Diabetic neuropathy, retinopathy, nephropathy as complications of diabetes mellitus" was 34% and 3D s patients had knowledge that "Meditation and yoga help in controlling blood glucose level".

B. Roaeid and A/H.A. Nabla their study Profile of diabetes health care at Benghazi Diabetes Centre, Libyan Arab Jamahiriya (2 OO7) revealed that the majority (74.2%) of our patients are illiterate, especially women (85.0%), suggests that even more efforts are needed to deliver diabetes related education. Education status and illiteracy did not seem to influence our patient's knowledge of diabetes and its complications. Educated patients had better knowledge about hypoglycemia and

its management, and side effects of diabetes on the kidneys than the illiterate patients, but this wasn't the case with respect to the effects of diabetes on the eyes, feet examination, urine examination, blood pressure checkup, and walking barefoot, where the difference between educated and illiterate patients was not different.

In our study majority i.e. about 3D% of patients were found to be illiterate and the knowledge about diabetes and their awareness about diabetic diet was found very poor in these patients. 34% of patients having primary and secondary education were found to be moderately aware about the irk disease. 36% of patients who are graduate and working as profession al were found to have excellent knowledge of diabetes and having awareness about diabetic diet. They know complications of diabetes and also knows the necessity of regular blood sugar level testing, eye checkup, foot care, medical advices, dietary consultation and compliance about medication. Hence there is need to improve the knowledge of diabetes among illiterate patients which forms majority groups.

V. Summary And Conclusion

SUMMARY

- Majority of diabetes patients belongs to age group 41-50 years (46%) whereas 32% belongs to age group 31-40 years.
- Male and females were equal in numbers (50%).
- Maximum of diabetes patients resides in rural areas (60%).
- Most of them are illiterate (29.33%),
- 46% of diabetes patients have their life style as sedentary and 44% strenuous.
- The overall mean knowledge score was (12.58±3.69) which is 38.12% of total score reveals that diabetic patients had a poor knowledge.
- No significant difference is found in the knowledge about diabetes in relation to lifestyle (F=1.72, p-value=0.19).

VI. Conclusions And Recommendations

We arrive at the opinion that better continuing care and more effective education is needed for diabetic patients in AVBRH.

- Blood sugar leveI testing and fundus examination, should be an integral part diabetes care. Patients on insulin, especially those that are young and educated, should be provided with glucometers for self- monitoring of blood glucose. Laboratory facilities should include lipid profile, estimation of HbAlc, and urine for micro-and macro proteinuria.
- Patients should be educated about the nature of diabetes, importance of treatment compliance, foot care, exercise, symptoms and treatment of hypo glycaemia. There should be visual demonstrations on how to inject insulin, feet check-ups, and nail-cutting.
- A dietician, preferably someone with knowledge or background about Indian food and eating habits, should be available daily in the hospital. A full-time ophthalmologist is crucial. Health care providers (doctors, nurses, and other medical personnel) should be trained both locally and abroad on diabetes health care.

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