Knowledge and Practices for Healthy Lifestyle among Diabetics in Bahawalpur

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Abstract:

Diabetes is a heterogeneous group of disease characterized by chronic elevation of glucose in blood. Diabetes is the leading cause of end stage renal disease, adult onset blindness and non- traumatic lower extremity amputationworldwide, resulting from atherosclerosis of the arteries. According to WHOestimation in 2010 there were globally 285 million people (approximately 6.4%of adult population) suffering from diabetes. The number is increased to 422 million in 2014 .Ageing and obesity are two main reasons for increase where-as genetics also play an important role.

Objectives

To assess Knowledge and Practices for Healthy Lifestyle amongdiabetics in Bahawalpur, Pakistan.

Study Design. An observational (descriptive) cross sectional study was carried out.
Setting. Carried out at outpatient departments (OPD), Bahawal Victoria Hospital, Bahawalpur, Pakistan.
Duration. April-May 2016
Subject/Methods. A sample of visitors (patients and their attendants, hospital staff) in different outpatients departments of BVH, Bahawalpur by simple random sampling was taken. Data was collected by pre-designed questionnaire.
Ethical Issues. An informed consent was taken from all participants.

Results

The results of present study revealed that diabetes is most prevalent in age group of 40-60 years (54 %). Health practices were found to be good in those who attended university (88.88%) as compared to those who never went to school. Disease was distributed in respondents of upper economic class (56% of respondents). Males had better knowledge (63%)than females(37%). 58% people who had disease were those with positive family history.57% of people believed that diabetics should take multiple small meals instead of few large ones . 67% of respondents believed that all underground vegetables are prohibited for diabetics and 50% believed that fish is best type of meat for their health. 83% of the sample believed that vegetable oil as best kind of fat. 93% believed that regular walk is important for disease control and 70% believed that foot care is necessary in diabetics.. Only 35% people believed had adequate knowledge about HbA1c. 45% people believed that diet drinks can be consumed as much as wanted.

Key Words

Conclusion

By our study sample it is concluded that overall community awareness about disease duration, complications and preventive measures of diabetes mellitus is satisfactory. Well educated diabetic patients have good knowledge about disease regular checkup, complications and preventive measures (for example; regular walk) than less or uneducated patients. Males have good knowledge than females, but overall knowledge about diet schedule, medication and timings of test was not satisfactory. Care about feet was not practiced. Males were affected more; especially good socioeconomic status at age 40-60 years. Health practices were not found to be up to the mark. So, appropriate education about dietary control, life style, regular checkups and proper use of medicines should be given to control the disease.

Introduction

Diabetes mellitus has become a major chronic disease globally. WHO (2007), had estimated 30 million people worldwide had diabetes in 1985 and this estimation increased to 135 million a decade later. WHO also estimated that the number of people with diabetes, worldwide, in 2000 was 171 million and it is likely to be more than double by the year 2030. While in Malaysia diabetes was ranked at the number six top killers among the other non-communicable diseases in year 2005.

There are two main types of diabetes which is insulin dependent diabetes mellitus (Type 1 DM) and non-insulin dependent diabetes mellitus (Type 2 DM). Other types include gestational and drug induced diabetes mellitus. However, type 2 DM is the most common type of diabetes and usually seen in people over 35 years of age.

Those who are at high risk of getting type 2 DM are people who are obese, practice unhealthy diet, middle aged or elderly, people who have a family history of type 2 DM, those who are physically inactive, or females who have history of gestational diabetes during pregnancy. Apparently, those factors are all modifiable. On the other hand, the well-educated individuals with a good attitude, who always practice a healthy lifestyle, healthy diet and exercise regularly, have reduced possibility of being inflicted with diabetes disease.

Furthermore, people with prolonged diabetes are at high risk to develop long term health complications such as heart attacks, strokes, kidney failure, blindness, amputations and etc.Thus, it is vital to reduce the mortality associated with the complications of diabetes mellitus as early as possible. This might avoid from sustaining its long term treatment cost which is very costly and indirectly would cause the government to spend more money to solve it.

The studies have identified the factors related to the increase of DM among the people in particular study areas. As a result, it brings much better understanding of the importance of primary prevention and control of diabetes in the community. It is however very difficult to change peoples' behavior and attitudes towards diabetes as it requires well-structured diabetes programme to educate every individual, especially those who have diabetes.
Moreover, it is a question whether the information regarding diabetes disease is accessible to those who live in rural areas, as that most of the health services are centered in capital. Those people are actually the high risk population. Mainly, they are a group of people who have low educational level with low income, unemployed, practice unhealthy lifestyle and have less accessibility to information. Therefore, it is crucial to do a study on the knowledge, attitude and practice of diabetes among the villagers who have diabetes in that particular-area.

Diabetes mellitus is a serious public health concern all over the world. In Pakistan diabetes is on rise and if proper intervention and preventive strategies are not adopted the epidemic of diabetes will prove fatal. As we are in the middle of a global epidemic of this disease and projected increase in the prevalence of diabetes over the next two decades emphasizes the importance of implementing primary prevention, early detection and imparting educational preventive program. The preventive programs targeted towards general population showed greater benefits rather than targeting only high risk and diseased population. Different studies have proved modifiable risk factors of type II diabetes includes; obesity and physical inactivity. If we could detect and prevent these risk factors earlier, the onset of disease can be delayed and prevented. Knowledge about the disease plays a vital role in future development of disease and its early prevention and detection.

Literature Review

Currently, DM is among the top five global risks for mortality. The treatment of this disease includes not only drug intervention, but mostly a change in lifestyle. Among the modifiable factors, careful dietary practice is one of the essential elements for the control of diabetes, since this disease is often the result of unhealthy lifestyle.

WHO data from the Geneva report of 2005 ; indicates that about 80% of cases DM could be avoided through the adoption of dietary practices, such as regular but controlled consumption of fruit and vegetables, reduced consumption of saturated fats, sodium and sugary drinks, as well as increased physical activity and control of smoking habits. Faced with such evidence, secondary prevention is essential, since it can positively change the evolutionary history of these problems, improving prognosis and life expectancy and quality.

A cross sectional descriptive study was conducted at out-patient clinics of three family health centers chosen randomly in **Dakahlia Governorate in 2012**.Three quarters of studied patients knew the symptoms of diabetes and two thirds of patients knew the role of genetic factors in diabetes while, 39.3% of patients were knowledgeable about causes of diabetes and only one third of patients were knowledgeable about the normal fasting blood sugar level.71.3% of studied patients knew that oral pills as a drug for treating diabetes and 38.8% of patients were knowledgeable about the successful management of diabetes by lifestyle changes while, one third of patients knew about insulin therapy. Most patients knew the importance of evenly-spaced meals, 36.4% knew the importance of regular exercise program and one third of patients knew the cardio-protective effect of cholesterol limitation and diet plan during infection while, 30.8% knew the importance of individualized diet plan. 80.5% of studied patients knew about compromised immunity in diabetes and the importance of diabetic foot care and less than two thirds knew diabetes complications.

Another **study was conducted in Scotland**, and three main conclusions were highlighted. First, whether in relation to healthy or unhealthy food consumption, healthier dietary practices were more frequent in women (66%) than men (34%). Second, no differences were found for dietary practices when comparing those diagnosed with DM or the rest of the sample, even among women. Third, the few results that pointed to better dietary practices of individuals with DM compared to healthy individuals were completely

confounded by socio-demographic variables, especially after adjustment for education level.

A study **was conducted in Brazil** and Brazilian entities recommend a diet rich in fruits and vegetables, low in saturated and total fat, and reduced consumption of sugary drinks, as primary and secondary prevention measures in fighting against obesity and non communicable diseases (NCDs). Healthy dietary practices may be responsible for conversion rates of insulin resistance to type 2 diabetes by up to 43% in a period of twenty years. Despite this evidence, and that the existing recommendations should be followed by the entire population, three of the healthy dietary practices examined have much lower frequency than expected, even among people diagnosed with diabetes mellitus (DM). In both genders and regardless of disease condition, the frequency of daily fruit intake did not exceed 20%. In turn, regular consumption of fried foods and sodas ranged from 40-60% (higher in men than in women). This scenario has also been evidenced in high-income countries.

The NHANES study, conducted in the United States with 40–74 year-old individuals, assessed from 2001–2006, showed that only 26% of participants consumed five or more servings of fruits and vegetables, and individuals with history of DM or cardiovascular diseases showed no differences in dietary practices compared to healthy subjects . Several interventions to encourage the consumption of healthy foods, as well as other health care actions have been carried out, but showed poorer results, often improving the knowledge, but not the healthy behaviors. On the other hand, the literature also indicates deficiency in the quality of information passed on by health professionals to diabetes mellitus in relation to lifestyle changes. While treatment guidelines for these diseases do recommend changes in lifestyle as the first therapeutic measure for secondary prevention, health professionals use the prescription of hypoglycemic agents as initial treatment for these patients.

The relationship between education and foot care among diabetics has been observed in similar studies **in India, Iran and Pakistan** where illiterate patients were the least knowledgeable. The knowledge of appropriate foot care has been suggested to be positively influenced by patient's education which in turn reduces the risk of foot ulceration and amputation in high risk patients. Women and those above the age of 50 were less knowledgeable about foot care, although these associations were not statistically significant in the particular study. Similarly in some third world countries due to socio-cultural beliefs women are not allowed to attain higher educational status compared with their male counterparts in the family, eventually resulting in women having less knowledge of DM foot care. This study also revealed that a very small proportion of the diabetic patients (10.2%) had good practice of diabetic foot care (score ≥70%) while almost half (49.4%) had a poor practice of diabetic foot care. This poor level of foot care practice in this study is in agreement with other previous studies.

A study was conducted on **members of the general public in Singapore** to evaluate their level of knowledge about diabetes, and the results indicated that the respondents had an acceptable level of knowledge (55%)

Another study was done on knowledge and perceptions of diabetes in a **semi-urban Omani population**; it found that subjects' level of knowledge was suboptimal (23.3%)

A study conducted on people with diabetes attending the **Aga Khan University Hospital (AKUH) in Pakistan 2010** found that 12%, 35%, and 53% of the patients had knowledge of the symptoms, treatments, and complications of diabetes.

According to **a study conducted in nine areas of India in 2016**, 376 diabetics were interviewed in the eye clinics, of which 62.8% (236) were selected from facilities in cities with a population of 7 million or more. The mean duration of known diabetes was 11.1 (±7.7) years. Half the respondents understood the meaning of adequate glycemic control and 45% reported that they had visual loss when they first presented to an eye facility. Facilities in smaller cities and those with higher educational status were found to be statistically significant predictors of self-reported good/adequate control of diabetes. The correct awareness of glycemic control was significantly high among attending privately-funded facilities and higher educational status. Self-monitoring of glycemic status at home was significantly associated with respondents from larger cities, privately-funded facilities; those who were better educated and those who reported longer duration of diabetes. Duration of diabetes (41%), poor glycemic control (39.4%) and age (20.7%) were identified as the leading causes of diabetic retinopathy. The commonest challenges faced were lifestyle/behavior related.

A population-based study conducted in the city of **Florianopolis, southern Brazil in 2009.** . Dietary practices were assessed using a semi-quantitative food consumption questionnaire. The following were considered as adequate: regular intake (≥ 6 times/week) of fruit and vegetables, daily intake of fruit (≥ 3 times/day) and vegetables (≥ 2 times/day), intake of lower than 2 times per week of meat fat, fried foods, and soda. The most frequently consumed unhealthy foods were fried food (51.0%) and soda (57.9%). Of healthy foods, fruits were less consumed on daily basis. In general, women showed better dietary practices than men. In adjusted analysis none of dietary practices was

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more frequent among diabetic or hypertensive adults compared with healthy individuals, regardless of gender. No differences were found between healthy and unhealthy adults, when the number of dietary practices was assessed.

A cross sectional study described the knowledge, attitudes and practices regarding lifestyle modifications (KAP) among 217 type 2 diabetes mellitus patients attending **Mamelodi Hospital, Pretoria, Republic of South Africa** . Most participants were in the age group of 51-60 years 93(42.9%). Majority of them had low level of education 108(49.5%) and low income 206(94.9%). Majority of participants were obese 153(71%) with more female diabetic patients being obese 120 (78.4%) than male 33 (21.6%). 15 participants (14 females and 1 male) were morbidly obese (BMI≥40kg/m2). 108 participants (49.5%) did not have a formal education. No respondent had good knowledge and 92.6% of respondents had poor knowledge of the benefits of exercise, weight loss and healthy diet. Majority of respondents (97.7%) had bad practices in relation to lifestyle modifications. Nevertheless, majority of them (84.3%) had positive attitudes toward lifestyle modifications.

Significant positive correlation (r= 0.170, p=0.012) was found between the global knowledge level and attitude level alone, whereas there was no significant correlation found between the global knowledge level and practice level as well as the attitude level and practice level.
Thus different studies were conducted in different parts of the world and showed interestingly similar results on most aspects of disease.

Objective

The main objective of study is:To assess Knowledge and Practices for healthy lifestyle amongDiabetics in Bahawalpur City.

Materials and Methods

Setting. Our study was planned in Community Medicine Department Quaid-e-Azam Medical College Bahawalpur and conducted in outpatient departments of Bahawal Victoria Hospital Bahawalpur.

Duration. Study was conducted in April to May 2016.Data collection was completed in five days from 28th April, 2016 to 2nd June 2016.

Study Design. An observational, descriptive, cross-sectional type of study was carried out.

Sample size. A sample of 100 diabetic patients in OPD BVH, Bahawalpur was taken.

Sample Technique. Sample was selected by convenience sampling.

Inclusion criteria. People of age group 20 to 75 years having history of diagnosed diabetes for at least 2 years were selected.

Exclusion Criteria
1) People having history of less than two years of diagnosed diabetes.
2) People who refused to participate.

Scoring Criteria
Questions from "*Knowledge Section*" of questionnaire were scored according to following criteria;

1. Each question carries maximum 2 scores and minimum 1 score.
2. There were 24 questions in knowledge section. Accordingly each questionnaire carries maximum 48 scores and minimum of 24 scores in knowledge section.
3. Questions with single or multiple correct answers were given 2 scores.

Questions from *"Practices Section"* of questionnaire were scored according to following criteria;

1. Each question carries maximum 2 scores and minimum 1 score.

2. There were 9 questions in this section. Accordingly this section carries maximum 18 scores and minimum of 9 scores.
3. Questions with single or multiple correct answers given 2 scores.

Operational Definitions

Serious Disease. A serioushealth condition is defined as an illness, injury, impairment or physical/ mental condition that meets any one of the following:
1) Involves inpatient care in a hospital, hospice, or residential medical care facility.
2) Continuing treatment by a health care provider that consists of a period of incapacity for more than three consecutive days.
3) Periods of incapacity in related to pregnancy and childbirth, including prenatal care.
4) Chronic conditions-episodic incapacity,

permanent/long-term conditions or multiple treatments.

Good Knowledge. The people scoring 36-48 scores according to scoring criteria of knowledge section of questionnaire have good knowledge of diabetes.

Poor Knowledge. The people scoring 24-35 scores according to scoring criteria of knowledge section of questionnaire have poor knowledge of Diabetes.

Good Practices. The people scoring 11-14 scores according to scoring criteria of practices section of questionnaire have good health practices in relation to diabetes.

Poor Practices. The people scoring 7-10 scores according to scoring criteria of practices section of questionnaire have poor health practices in relation to diabetes.

Data Collection Procedure. A pre-coded and pre tested questionnaire was administered by researcher in a face to face interview approach. The questionnaire was ranslated by an Urdu literature master. Questionnaires were divided amongst researchers. Questionnaire had questions about demographic information, knowledge and practices regarding diabetes. One hundred questions were produced. People were selected randomly and their consent was obtained after introduction of researcher. The purpose of study was very carefully explained to the target population.

Data Analysis

The data from all questionnaires was translated back to English and analyzed manually. The frequency distribution tables were made. Frequency of good knowledge and poor knowledge was found among different demographic variables i.e. gender, economic status and education. The graphs and charts were made using Microsoft Word 2010, Microsoft Excel 2010 version14.0.4760.1000 (32 bit). Results were displayed in tabulated forms along with some charts and graphs. Any relationship was subjected to statistical analysis as all the variables were quantitative in nature.

Results

The results of present study revealed that out of sample of hundred people conducted disease was most prevalent in age group of 40-60 years (54 %). Moreover 63% of affected respondents were males with distribution of disease not apparently affected by the level of education although people with no schooling or schooling up to 5th grade were generally more affected, 26% and 23% respectively. Health practices were found to be good in those who attended university (88.88%) as compared to those who never went to school (85.18%). Disease was distributed in people of upper economic class (56% of respondents) and only 3% prevalence in low economic class people. Males had good knowledge (63%) than females (37%). 58% people who had disease were those with positive family history. 77% people were well aware that diabetes is a lifelong chronic disorder and 94% people believed that regular blood glucose monitoring is important for disease control. 55% people considered fasting as the reliable time of blood glucose monitoring and 51% people considered oral medication as best mode of medication for their health. 72% people believed that insulin is a red flag indicating that the disease is in the last stage. 47% of people believed that three meals should be taken by a diabetic per day and 57% of people believed that portion of meal should be small. 67% of people believe that all underground vegetables are prohibited for diabetics and 47% believed that only 1 type of fruit should be taken by a diabetic per day. 50% of people believed that fish is best type of meat for their health and 83% believed that vegetable oil is best kind of fat. 93% believed that regular walk is important for disease control and 70% believed that foot care is necessary in diabetics. None of the respondent believed that persistent high sugar

Levels can affect heart, kidney and eyes all three organs. Only 35% people believed that HbA1c should be monitored three times per year and a significant number of people; about 24%; did not know about HbA1c test. 42% people believed that fresh juices can be consumed by diabetics as much as they want and 45% people believed that diet drinks could be consumed as much as wanted. Only 1% people believed that all types of juices and drinks are prohibited for diabetics.

Table 2. Distribution of respondents in relation to education

Education	Frequency	Percentage
No schooling	26	26 %
Up to 5th class	23	23 %
Up to 10th class	23	23 %
Attended College	18	18 %
Attended University	10	10 %

Table 1. Distribution of respondents in relation to age

Age (years)	Frequency	Percentage
0-20	1	1%
20-40	23	23%
40-60	54	54%
>60	22	22%
Total	100	100%

Total	100	100 %

Table 3. Distribution of good and poor health practices among diabetics according to education

Education	Good Practice	Poor Practice	Total
No schooling	23 (85.18%)	4 (14.81%)	27 (27%)
Up to 5th class	15 (68.18%)	7 (3.18 %)	22 (22%)
Up to 10th class	22 (91.66%)	2 (8.33%)	24 (24%)
Attended college	16 (88.88%)	2 (11.11%)	18 (18%)
Attended University	8 (88.88%)	1 (11.11%)	9 (9%)
Total	84 (84%)	16 (16%)	100 (100%)

Table 4. Distribution of respondents in relation to Gender

Gender	Frequency	Percentage
Male	63	63%
Female	37	37%
Total	100	100

Table 5. Distribution of respondents in relation to monthly income

Monthly income (PKR)	Frequency	Percentage
Up to 5000	3	3%
5000-15000	31	31%
15000-20000	10	10%
Above 20,000	56	56%
Total	100	100%

Table 6. Distribution of good and poor knowledge according to Gender

Gender	Frequency of good knowledge	Frequency of poor knowledge	Total
Male	42 (66.66%)	21 (33.33%)	63 (63%)
Female	21 (56.7%)	16 (43.24%)	37 (37%)
Total	63 (63%)	37 (37%)	100 (100%)

Table 7. Distribution of family history of Diabetes in respondents

Family History	Frequency	Percentage
Yes	58	58%
No	42	42%
Total	100	100%

Table 8. Distribution of good and poor knowledge according to Education

Education	Frequency of good knowledge	Frequency of poor knowledge	Total
No schooling	7 (25.93%)	20 (74.07%)	27 (27%)
Up to 5th	11 (50%)	11 (50%)	22 (22%)
Up to 10th	15 (62.5%)	9 (37.5%)	24 (24%)
Attended college	16 (88.88%)	2 (11.11%)	18 (18%)
Attended University	7 (77.77%)	2 (22.22%)	9 (9%)
Total	56 (56%)	44 (44%)	100 (100%)
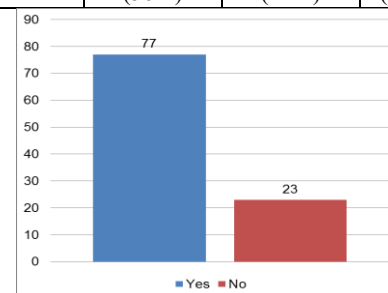
Figure 1. Perceived belief of respondents of diabetes as life-long chronic disorder

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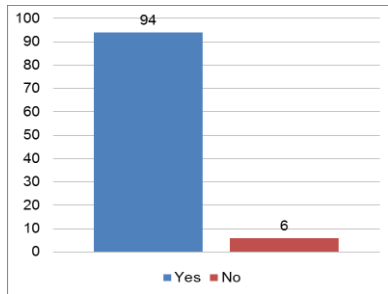p-ISSN: 2348-795X
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Figure 2. Perceived belief of respondents about regular glucose monitoring as an important factor in disease control

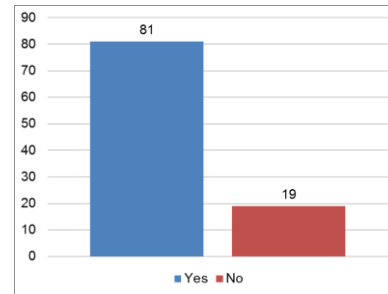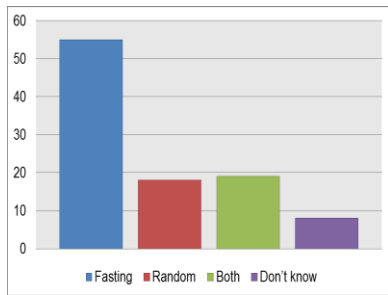**Figure 3. Perceived belief of respondents about most reliable time of blood glucose monitoring**
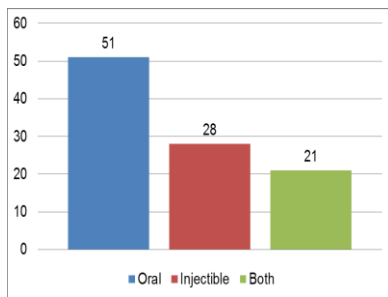

Figure 4. Perceived belief of respondents about the best type of medicine for diabetes

Figure 5. Number of respondents who belief that insulin is recommended in last stage of disease

Figure 6. Perceived belief of respondents about the fact that use of insulin can delay complications

Figure 7. Perceived belief of respondents that insulin can delay complications

Figure 8. Perceived belief of respondents about the number of meals that should be taken by a diabetic per day
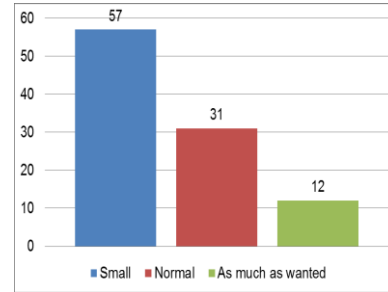
Figure 9. Perceived belief of respondents about the portion of serving that should be taken by a diabetic per meal
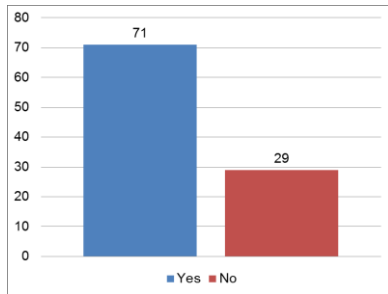
Figure 10. Percentage of respondents who belief that all types of vegetables are better for diabetes
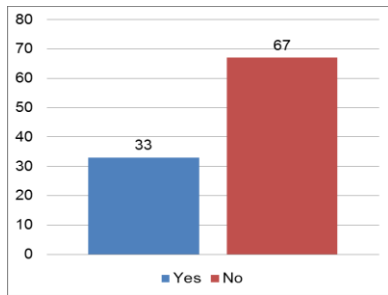

Figure 11.Percentage of respondents who believe that all underground vegetables are prohibited for diabetics.
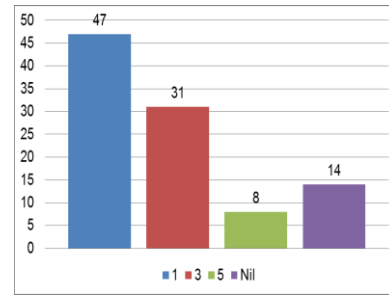
Figure 12. Percentage of respondents who believe that respective varieties of fruits should be taken by a diabetic per day
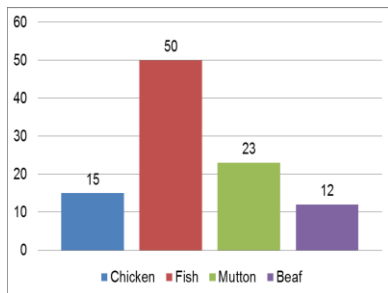

Figure 13. Perceived belief of respondents about variety of meat having cardio-protective effect
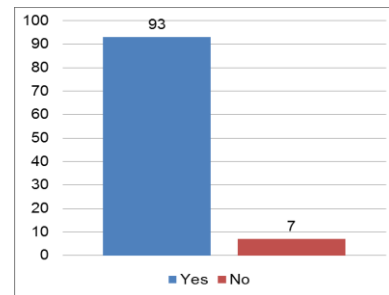

Figure 15. Perceived belief of respondents about regular walk as an important factor in disease control
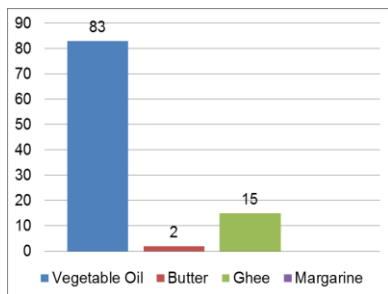

Figure 14. Perceived belief of respondents about the type of fat better for their disease
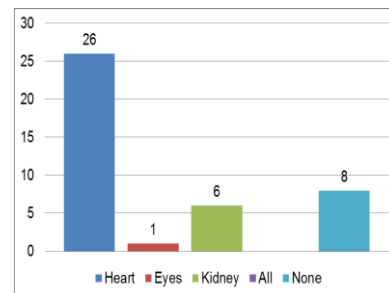

Figure 16. Perceived belief of respondents that persistent high sugar levels can adversely affect respective organs of body
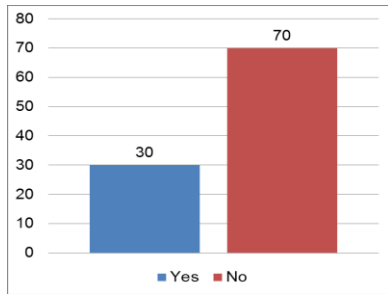
Figure 17. Perceived belief of respondents that foot care is important in diabetics
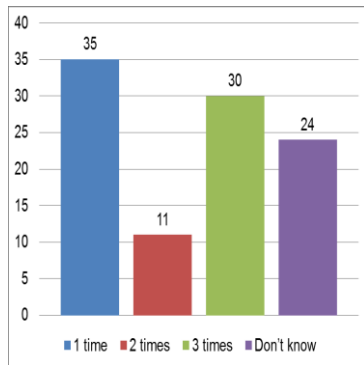

Figure 18. Perceived belief about the number of times in a year HbA1c should be checked in diabetics
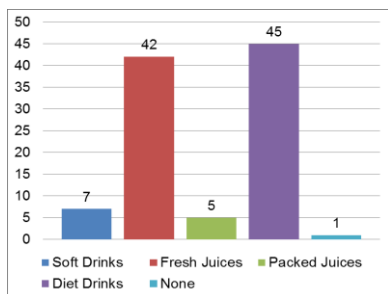

Figure 19. Perceived belief about the type of drink/juice that a diabetic can consume as much as wanted
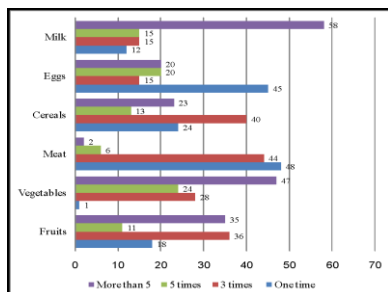

Figure 20. Intake amount of essential food items by respondents per week

Discussion

The available scientific knowledge concerning diabetes mellitus is an important resource to guide and educate diabetes patients concerning self-care. Self-care concepts that can benefit patients include adherence to diet, physical activity, blood glucose monitoring, and taking oral medication and insulin. Few studies regarding the relationship between knowledge and self-care practices among newly diagnosed diabetics are available in Bangladesh or elsewhere in the world. Studies have mostly involved the general population and type 2 diabetes patients who have had the disease for a significant period of time. This study was undertaken in order to assess the relationships between knowledge and self-care practices among newly diagnosed type 2 diabetics attending different healthcare centers in Bangladesh.

In the present study, it is encouraging noting that the majority of respondents had average basic (66%) and technical (78%) knowledge regarding diabetes mellitus (DM). A study was conducted on members of the general public in Singapore to evaluate their level of knowledge about diabetes, and the results indicated that the respondents had an acceptable level of knowledge . Another study was done on knowledge and perceptions of diabetes in a semi-urban Omani population; it found that subjects' level of knowledge was suboptimal. A study conducted on people with diabetes attending the Aga Khan University Hospital (AKUH) [15] in Pakistan found that 12%, 35%, and 53% of the patients had GAP knowledge of the symptoms, treatments, and complications of diabetes.

With regard to self-care practices, it was unfortunate to note that the majority (90%) of this study's respondents from all three basic knowledge groups did not test their blood glucose regularly. However, the relationship was significant. Similar results were found in technical knowledge groups, and the relationship was not significant. These results revealed that the frequency of blood glucose monitoring increases gradually as the level of knowledge changes. The patients in this study showed higher rates of self-monitoring than those found in the study from Singapore

Further findings indicated that a good number of the respondents in each basic knowledge group did exercise, and the rate of exercise rose with increasing levels of knowledge. Similar and significant results were found in this study's technical knowledge groups. In Peshawar, it was found that 75% of subjects who had had diabetes for 9 years did exercise in order to control blood glucose. In the present study, many respondents in all three basic and technical knowledge groups did not take extra care of their feet regularly. Moreover, only 16%, 13%, and 12% of patients in GAP basic knowledge groups did not smoke. Almost the same rates of smoking were found in the

technical knowledge groups. About 80% of respondents with good levels of basic knowledge consumed betel nuts; more than half of the respondents from the poor and average basic knowledge groups also had the same practice. Similar results were found in the three technical knowledge groups, and the relationship was significant both in basic and technical knowledge groups.

Diet plays an important role in the prevention and management of DM. The majority (90%) of the respondents in each basic and technical knowledge group did not follow dietary advice given by diabetes educators. Diabetes significantly changes the relationships between patients, their bodies, and the world around them, and restrictions on eating habits make them more aware of their limitations. This is why the conflict between the desire to eat and the imperious need to refrain from indulging such desire is always present in the daily lives of people with diabetes. This conflict might be an important element in understanding the respondents' low rates of positive practices for coping with the disease. About 26%, 42%, and 51% of GAP basic knowledge groups were aware of the practice of following fixed times for eating their main meals, a significant relationship. Similar and significant results were found in the technical knowledge groups. Notably, about one-third of respondents in all basic and technical knowledge groups partially practiced the measurement of food before eating, a significant result.

Respondents of the present study were fairly informed about diabetes management and we have found an association between basic knowledge and practice. There is evidence that patient awareness is the most effective way to lessen the complications of diabetes. Business, one of the categories of occupations, has also been identified as determinant of good practice. We assume that this might have been due to their better access to goods and services as well their independence in availing the health care. Contrarily, rich people showed lower level of practice. The reason needs exploration.

In this study, several explanations were possible for the fact that respondents had average knowledge of DM but inappropriate self-care practices. First, the bulk of the respondents had family history of diabetes. It would be reasonable to assume that diabetic family members would share their knowledge with non-diabetics and newly diagnosed diabetics. Second, as the respondents in this study were newly diagnosed, they had not attended any structured diabetes education programs. Ignorance, high confidence level and lack of time may also be the reasons behind the scenario. Various issues need to be addressed in order to close the gaps between knowledge and practice. The results of this study encourage a positive outlook: all that is required is that a diabetes educator trained in diabetes

management counsel patients during every visit and counseling may have an impact in improving the perception about disease, diet, and lifestyle changes and thereby on glycemic control and the complications of diabetes.

Conclusion

By our study sample it is concluded that overall community awareness about disease duration, complications and preventive measures of diabetes mellitus is satisfactory. Well educated diabetic patients have good knowledge about disease regular checkup, complications and preventive measures (for example; regular walk) than less or uneducated patients. Males have good knowledge than females, but knowledge about diet schedule, medication and timings of test was not satisfactory. Care about feet was not practiced. Males are affected more especially good socioeconomic status at age 20-40 years. Therefore, appropriate education about dietary control, life style, regular checkups and use of medicines should be given to control the disease.

Recommendations

[1] By the results of our study sample it is necessary to create awareness among the people about disease, chronic nature, and preventive measure for diabetes, medication and dietary habits.

[2] Life style should be changed according to health condition and regular walk/exercise is necessary to maintain health.

[3] Health care providers should focus on explaining prevention and healthy practices as hallmark of treatment instead of medication although later is an important factor in control of complications

[4] Regular checkup and regular medicine intake should be recommended.

[5] Dietary schedule (vegetables, fruits, juices, meat, and oil) amount of meal should be described to them. This can be done by distribution of diet charts in diabetic patient.

[6] Awareness about complication, eye examination should be given to them.

[7] There is need for the implementation of hospital based lifestyle intervention program to improve the knowledge of patients regarding healthy lifestyle and emphasize the importance of exercise and weight loss in the management of type 2 diabetes mellitus. This should be extended to the primary health care clinics where the majority of patients are seen.

[8] Medical nutrition intervention program should be implemented with a multidisciplinary team (Doctor, dietician, social worker, psychologist…).

[9] Health care providers should focus on explaining prevention and healthy practices as hallmark of treatment

instead of medication although later is an important factor in control of complications.

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