*A. Bano et al. (2017) Int. J. Appl. Sci. Biotechnol. Vol 5(2): 227-236*
DOI: 10.3126/ijasbt.v5i2.17625

ISSN (Online): 2091-2609
DOI Prefix: 10.3126/ijasbt

International Journal of Applied Sciences and Biotechnology (IJASBT)

Research Article

# Dietary knowledge, Attitude and Practices of Diabetes Patients at Services Hospital Lahore

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## Abstract

**Introduction:** Diabetes mellitus is growing fastly the world is witnessing. The incidence of alarming concern to health care providers is rapidly rising. The main burden of this disease will fall on all developing countries. The number of diabetic patients will reach 300 million by the end of 2025 it is known through the estimation mostly developing countries will have such a dramatic and significant impacts. **Methodology:** The quantitative descriptive cross-sectional study design was used with convenient sampling (n=142) from Services Hospital Lahore. Using the questioner consist of 34 items data was analyzed through spss21 version descriptive analyses and the chi-square test with ($p$=<0.05) was used. **Results:** Findings of the study that only 19% had good knowledge they answered 8 or more correct responses remaining 81% participants answered less than 50% correct responses had poor knowledge. The 41.5% had positive attitude with diabetic diet while the remaining 58.5% were having negative attitude. The findings also revealed that only 17.6% had good practices they answered 50% and above correct responses while the others 82.4% participants answered less than 50% correct responses and were doing poor practices about the diabetic diet. The significant association was found between the gender and patient's knowledge and no significant association between the education and patient's dietary knowledge. **Conclusion:** The diabetes type 2 patients should have up to mark dietary, knowledge, and keep it in practicing well. It will, prevent from diabetes complications. There is need to improve the patients knowledge and provide education them.

**Key words:** Knowledge; Attitude; practices; Diet; Diabetes patients

## Introduction

Dietary management in diabetes type 2 patients is cornerstone of care. Many diabetics in the United Arab Emirates(UAE)have less dietary knowledge, positive attitude and satisfactory diabetes practices towards the importance of DM care (Al-Maskari *et al*., 2013).

Dietary knowledge is significant factor to improve the dietary pattern in our society. According to (Lesser *et al*. 2014) knowledge regarding diet can change the unfavorable dietary pattern among the diabetes patients. Positive attitude towards dietary management may control the blood sugar among the diabetes patients (Wang *et al*., 2014). Proper practices according to recommended diet by expert dietician prevents from further complications of diabetes (Davison, Negrato *et al*., 2014)

Importance of the dietary knowledge, attitude and practice's (KAP) can be understood easily because it is most reached topic in abroad and as well as in Pakistan any organization can be productive at supreme level by improving the maximum level of dietary (KAP) among diabetes. In the health care settings poor dietary (KAP) among diabetes had effects on patients care and outcomes of organization (Adem *et al*., 2015).

Diabetes mellitus is growing fast the world is witnessing. The incidence of alarming concern to health care providers is rapidly rising. The main burden of this disease will fall on all developing countries it is known through the estimation by the end of 2025 the number of diabetic patients will reach 300 million. The developing countries

will have such a dramatics and significant impact (Al-Asmary *et al*., 2013).

In managing the type 2 diabetes patients' lifestyle changes regarding dietary pattern is required and under influence by one's, attitude, knowledge and practices (KAP) .Therefore there is necessary need to know about the risk factors in effective way before managing the diabetes type 2 patients. Since these major determinants will help to treat the diabetes type 2 in manner able way (Ntaate, 2015).

It is recommended by American Diabetes Association (ADA) Patients who are suffering and diagnose with diabetes need to be aware of their, nutrition as carbohydrates should be taken 45 to 65 percent of daily total calorie. Important Carbohydrates are fruits, green leafy vegetables, whole grains and beans. Fats should be taken 25 to 35 percent of daily calories. It is selected to take nonfat or low-fat dairy instead of whole milk products. Protein should be 12 - 20% of daily calories although this may be different and depending on a patient's requirement of health (Association, 2012).

Dietary knowledge is imperative perspective that, assume a major part of dietary information by developing the awareness and ultimately the health of the public. Knowledge regarding healthy diet and food safety can be predisposing factors for enhancing the dietary pattern habits and adopting eating routing among diabetes (Alliance, 2011). It is necessary to be good to yourself by gaining the dietary knowledge and practicing it well to remain physically healthy and active. The knowledge, attitude and practice must be considered with a specific end goal to advance the society well-being. This will promote food conscious society and more sound people(Elhassan, Gamal *et al*. 2013).

Furthermore, many studies have shown that, appropriate dietary pattern, is accepted as a Cornerstone of treatment among the diabetes patients (Ntaate 2015). However, it is a major problem to continue adherence healthy lifestyle changes (dietary pattern). A research conduct in Egypt findings are good adherence to dietary instructions was founded in 41.7% of diabetes patients (Ntaate 2015).

World health organization (WHO) defines attitude of person taking regular diet is adherence ''to extent in which respondent agree with recommendations from health-care provider regarding dietary pattern. Effective adherence to dietary pattern is strongly associated with healthy diet. Dietary adherence attitude linked to attaining glycemic control among diabetes and practices of to take recommended diet has integral part in improving diabetes outcomes (Basker, 2016).

A study by (Aurang Zeb *et al*, 2017) student of (BSCN) the aim of this study was to identify the dietary (KAP) among diabetes for normal blood glucose level the result of the study were knowledge deficit and poor practices among diabetes patients in Pakistan. The lack of positive attitude toward diabetic diet for maintaining normal blood glucose, so there is a great need for developing awareness among diabetic patients regarding the importance of both diet and to improve their compliance and change their attitude.

***Aim of the study***

The purpose of this study to assess the dietary knowledge, attitude, practices among the diabetes type 2 patients.

***Objectives***

- To assess the dietary knowledge among the diabetes patients.
- To assess the attitude of the diabetic patients related to dietary pattern.
- To assess the practices regarding dietary pattern in diabetics patients.

## Literature Review

Numerous literatures sport my study taken from different resources and sites like med line, Pub med, Health services system, books and journals, stated that, dietary management is most important factor to overcome the global burden of diabetes (Mattei, Malik *et al*. 2015).

It is estimated by (WHO) World Health Organization that there is the association between the dietary pattern and mortality rate; health organizations can increase their productivity of health outcomes by improving the dietary habits among diabetes type 2 (Micha ,Penalvo *et al*. 2017).

This study by (Wang, Song *et al*. 2014) conducted in Yakeshi, to assess the dietary knowledge, attitudes and practices among diabetes type 2 patients. The dietary control is very important to control the diabetes it is considered by (75%) of diabetic patients. Score for knowledge, attitude and practices overall (KAP) were low, but scores for attitude were high. After teaching to , patients' regarding dietary knowledge, awareness and practice they improved the level of KAP(Wang *et al*., 2014).

It is considered by (Gupta,*et al*. 2015) dietary management is the cornerstones of diabetes type 2 care. A research was conducted to recognize the level of dietary practices at outpatient department in 2012 among the diabetes patients .This study explores the factors associated with poor dietary practices, The ratio of poor patients they were not getting dietary education in hospitals (51.4%),who were feeling difficulty to selecting the recommended foods 95%, not-availability of vegetables and fruits 95%, who were worried about the cost of foods percent .This research shows there were poor practices among the diabetes of the patients they had poor dietary practice (Ayele, Tesfa *et al*. 2012).

Another study by (Gul, 2010) studied at the Department of Medicine, Khyber Teaching Hospital Peshawar. In this study, patients' knowledge regarding control diabetes,

determinants and complications was 33.5%, 69% and 39% respectively. Practices of diabetes towards the regularly checked the blood sugar level are (61%). The level of ( KAP) was very low in that area there is need for emphasize diabetes care for additional educational programs efforts(Gul 2010).

A research done by (Ntaate 2015) the purpose of this research was to assess the dietary (KAP) among diabetes type 2 at Nasambaya hospital Kampala. This research indicates the knowledge of patients (54%) and mostly participants had good attitude as (82.7%) towards diabetes. The practices of diet was poor females had (73.2%) and male (78%).All the participants had the correct attitude towards the management of DM and poor scores on the practices(Ntaate 2015).

KAP Study was conducted in Bangladesh to assess the level of dietary (KAP) among the general community regarding diabetes mellitus. It was founded by this study that, lower proportion only (41%) participants findings that they never know regarding dietary modifications help in diabetes control.(Islam, Chakrabarti *et al*. 2014).Knowledge related to diabetes and its complications is necessary, for public or even for the persons diagnosed with diabetes. The arrangements of health care programmes will enhance the knowledge among diabetes and decrease the burden of diabetes (Association, 2014).

Furthermore, many studies have done to identify the attitude, knowledge and practices among the diabetes type 2 patients this study conducted in Saurashtra region, Gujarat. The people don't have knowledge about diabetes and its quenceequences is (60%). Patients who were relied on dietary modification are more important rather than medication and exercise is (40%). Practices of patients regarding BSL checking were very poor they could not afford to check the BSL level on daily bases they were using the herbal medications (Shah *et al*., 2009).

On the other hand, A researched in India to assess the knowledge, attitude and practice of type 2 diabetes patients in Saurashtra region. The (50%) people have knowledge about diabetes. Bitter substance can control the diabetes and insulin should be prohibited (88%) people have believed on it. According to (Kant and Thapliyal 2015) there was misunderstanding regarding diabetes diet, and insulin. This research highlights awareness programmes can change the attitude of our public regarding diabetes as India being the world capital (Kant and Thapliyal 2015).

Recommended dietary plan for all diabetes patients is an effective component of the overall treatment plan (Association 2014).According to Joslin guidelines, (40%) carbohydrate is best recommended; it should be include 20 to 35 grams of fiber. Best fiber includes fresh fruits, beans vegetables, and whole-grain foods. Protein should be(20-30%) include in daily diet. protein rich source are chicken, turkey, fish , nonfat or low-fat dairy products, tofu and legumes Fat recommendation for diabetes is 30 to35 percent. Most appropriate fat sources are seeds, nuts, fatty fish, canola oil, olive oil, and like salmon (Jacobson, *et al*. 2013).

The aim of this study was to describe the dietary practices of Saudis who were suffering from diabetes type 2 and to compare these with the recommended practices. According to Mohamed Overall dietary profile, was very poor. Participants were not doing the appropriate practices as the values for intake protein (17.3%), fat (31.2%) and carbohydrate (56.9%) respectively. It was slightly higher than the recommendations.(Mohamed, Almajwal *et al*. 2013).

A study by (Odenigbo and Inya-Osuu 2012) non adherence to dietary pattern can lead to high blood sugar and several complications like heart, kidneys, eyes, and brain. Participants who had poor knowledge regarding diabetes are (57%) only (7.5%) had proper knowledge while (35.5%) had fair score. Dietary attitude (56.6%) had poor attitude towards adherence (Only 12%) had a good attitude. The subjects showed poor practices (50%) while 10% had good scores remaining 39% had fair score for practices.

All the above studies revealed that people with diabetes mellitus in different areas had poor knowledge, attitude and practices towards DM and dietary management. Though different studies explores poor dietary (KAP). Therefore, there is urgent need to enhance the patients knowledge it will improve the patient practices that will increase the overall wellbeing and prolong life span of people suffering from DM.

## Methodology

The study aim is to assess the dietary knowledge, attitude, and practices among the type 2 diabetes mellitus patients. Selected site where this study will be conduct the Services hospital Lahore and setting will be Diabetes Mellitus Center (DMC).A descriptive cross-sectional study design will be utilized to conduct this research. According to (Dictionary, 2012) a cross sectional descriptive study is one in which information is collect data one point in time without changing the environment (I.e. nothing is manipulated).

Convenience sampling will be used to collect the data. Every eligible patient will be approach as they will find to waiting for their turn to doctor room in the outpatient department for their routine monthly follow up appointments. The study tool adopted from American Diabetes Association (ADA) Diabetes Self-Management Assessment Research Tool (D-SMART) with some other questions from the University of Michigan Diabetes Research and Training Centre attitude, knowledge and practice questions. Tool has 4 sections as A-Demographic, B-Knowledge, C-Attitude and D-practices on Likert scale for data collection i.e.1. (Strongly disagree) 2. (Disagree) 3.

(Neutral) 4. (Agree) 5. (Strongly agree) and (Yes) (No) (I don't know). The Questionnaire has 34 questions as (Demographic 7, knowledge-16, attitude-3 and practice-8 questions) Target population; will be outdoor patients above 18 years old of age with the one year before diagnosis from diabetes type 2.

This study will be carried out from March 2017 to May 2017.All the diabetes outpatients, who will come for their follow up at (DMC) will be included in this study. Paramedical staff, staff nurses and doctors will be excluded from this study. Ethical approval will obtain from the ethical research committee university of Lahore and ethical committee of services hospital Lahore. The sample size will be 159-160 according (Kish, 1965) for sample collection. The data will be examined by means of Statistical Package for Social Sciences (SPSS) version 21. Informed consent was taken from all participants and all the information was kept confidential. Sample size determined by using this formula given by Kish.

## Result

### *Demographic Data*

The Questionnaire was distributed for data collection among (160) participants of Diabetes Mellitus type 2. Out of 160 Questionnaires, only 142 were return back with complete information, 12 forms were missing and 6 forms contain incomplete information regarding data. 142 forms were collected with complete information from Diabetes Mellitus Center (DMC) at services hospital Lahore. Descriptive data was analyzed by using SPSS version 21 for good results. Data was analyzed into two parts first part is demographic information and second part of the questionnaire related to knowledge, attitudes and practices of the diabetes type 2 patients regarding diet. Demographic data consist of 7 questions and other portion has 27 questions. Each question based on Likert scale mean, standard deviation, percent, range, skewness and kurtosis calculated.

**Table 1:** Demographic information of Participants

| S.N. | Content | (n) % | (n) % | (n) % | Cumulative Frequency |
|---|---|---|---|---|---|
| 1 | **Age** | 29 to 38 Years (n=4) 2.8% | 39 to 48 Years (n=46)32.4% | More than 48 years (n=92) 64.8% | (142) 100% |
| 2 | **Gender** | Male (n=81) 57% | Female (n=61)43% | - | (142) 100% |
| 3 | **Marital Status** | Married (n=127) 89.4% | Divorced n=7)4.5% | Widow (n=8)5.6% | (142) 100% |
| 4 | **Living arrangement's** | Living alone (n=51) 35.9% | Living with someone (n=91)64.1% | - | (142) 100% |
| 5 | **Education level** | Primary (n=1) 0 .7% | Secondary (n=32) 22.5% | Tertiary (n=109) 76.8 | (142) 100% |
| 6 | **Employment Status** | Formal labour (n=54) 38% | Causal labour (n=36) 25.4% | Unemployment (n=52) 36.6% | (142) 100% |
| 7 | **Is there any other family Member with Diabetes.** | Yes (n=47) 33.1% | NO (n=95) 66.9% | - | (142) 100% |

**Table 2:** Dietary knowledge of the participant's

| S.N. | Content | Yes (n)% | No (n)% | Don't Know (n)% | Cumulative Frequency |
|---|---|---|---|---|---|
| 1 | The diabetes diet is a healthy diet for most people. | (n=19) 3.4% | (n=121) 85.2% | (n=2) 1.4% | (142) 100% |
| 2 | Glycosylated hemoglobin (HbA1c) is a test that measures your average blood glucose level in the past week. | (n=20) 4.1% | (n=122) 85.6% | ---------- | (142) 100% |
| 3 | A pound of chicken has more carbohydrate in it than a pound of potatoes | (n=61) 43.0% | (n=54) 38.0% | (n=27) 19.0% | (142) 100% |
| 4 | Orange juice has more fat in it than low fat milk. | (n=32) 2.5% | (n=109) 76.8% | (n=1) .7% | (142) 100% |
| 5 | Urine testing and blood testing are both equally as good for testing the level of blood glucose. | (n=26) 8.3% | (n=115) 81.0% | (n=1) 0.7% | (142) 100% |
| 6 | Unsweetened fruit juice raises blood glucose levels | (n=30) 21% | (n=17) 12% | (n=95) 66.9% | (142) 100% |
| 7 | A can of diet soft drink can be used for treating low blood glucose levels. | (n=28) 19.7% | (n=113) 79.6% | (n=1) 0.7% | (142) 100% |
| 8 | Using olive oil in cooking can help lower the cholesterol in your blood. | (n=23) 6.2% | (n=119) 86.8% | ---------- | (142) 100% |
| 9 | Exercising regularly can help reduce high blood pressure. | (n=6) 4.2% | (n=136) 95.8% | ---------- | (142) 100% |
| 10 | For a person in good control, exercising has no effect on blood sugar levels. | n=13) 9.2% | (n=4) 2.8% | (n=125) 88.0% | (142) 100% |
| 11 | Infection is likely to cause an increase in blood sugar levels. | (n=20) 14.1% | (n=122) 82.2% | (n=1) 0.7% | (142) 100% |
| 12 | Wearing shoes a size bigger than usual helps prevent foot ulcers. | (n=46) 32.4% | (n=70) 49.3% | (n=26) 18.3% | (142) 100% |
| 13 | Eating foods lower in fat decreases your risk for heart disease. | (n=73) 51.4% | (n=35) 26.6% | (n=34) 23.9% | (142) 100% |
| 14 | Numbness and tingling may be symptoms of nerve disease. | (n=47) 33.1% | (n=73) 51.4% | (n=22) 15.5% | (142) 100% |
| 15 | Lung problems are usually associated with having diabetes | (n=18) 12.7% | (n=85) 59.9% | (n=39) 27.5% | (142) 100% |
| 16 | When you are sick with the flu you should test for glucose more often | (n=24) 16.9% | (n=80) 56.6% | (n=38) 26.8% | (142) 100% |

**Table 3:** Dietary Attitude of patients

| S.N. | Content | Yes (n)% | No (n)% | Don't Know (n)% | Cumulative Frequency |
|---|---|---|---|---|---|
| **1** | Dietary instructions should be written out even if the diabetic patient is illiterate. Someone at home should be available to interpret it for him/her. | (n=38) 26.8% | (n=35) 31.7% | (n=59) 41.5% | (142) 100% |
| **2** | Being drunk while on diabetic drugs is not a serious problem | (n=49) 34.5% | (n=71) 50.0% | (n=22) 15.5% | (142) 100% |
| **3** | Diet and exercise are not as important as treatment in control of Diabetes. | (n=48) 33.8% | (n=38) 26.8% | (n=56) 39.4% | (142) 100% |

**Table 4:** Dietary Practices of participants

| S.N. | Content | Strongly agree (n)% | Agree (n)% | Neutral (n)% | Disagree (n)% | Strongly disagree (n)% | Cumulative Frequency (n)% |
|---|---|---|---|---|---|---|---|
| 1 | In the past 1 week often have you missed or skipped meals | (n=60) 42.3% | (n=18) 12.7% | (n=11) 7.7% | (n=21) 14.8% | (n=32) 22.5% | (142) 100% |
| 2 | In the past 1 week have you eaten more than you know you should? | (n=38) 26.8% | (n=2) 1.4% | (n=27) 19% | (n=46) 32.4% | (n=29) 20.4% | (142) 100% |
| 3 | In the past 1 week have you eaten high fat foods like fried animal protein | (n=36) 25.4% | (n=6) 4.2% | (n=11) 7.7% | (n=53) 37.3% | (n=36) 25.4% | (142) 100% |
| 4 | You are able to fit dietary management into your life in a positive manner. | (n=25) 17.6% | (n=11) 7.7% | (n=18) 12.7% | (n=50) 35.2% | (n=38) 26.8% | (142) 100% |
| 5 | Do you involve your family in helping you follow a meal plan | (n=21) 14.8 | (n=34) 23.9 | (n=13) 9.2 | (n=23) 16.2 | (n=51) 35.9 | (142) 100% |
| 6 | You are empowered to control/avoid sweets or limit fatty foods? | (n=41) 28.9% | (n=2) 1.4 % | --------- | (n=46) 32.4% | (n=53) 37.5% | (142) 100% |
| 7 | Do you eat only that which is available or only what you can afford irrespective of content | (n=14)9.9% | (n=16) 11.3% | (n=11) 7.7% | (n=32) 36.6% | (n=49) 34.5% | (142) 100% |
| 8 | Does diabetes interfere with or prevent you from doing your normal daily activities. | (n=17) 12.0% | (n=33) 23.2% | --------- | (n=36) 25.4% | (n=56) 39.4% | (142) 100% |

**Table 5:** Overall dietary knowledge attitude and practices of participants

| **S.N.** | **Content** | **(n) %** | **(n) %** | **Cumulative Frequency** |
|---|---|---|---|---|
| 1 | Overall Knowledge of Participants regarding diabetic diet. | Good (n=27) 19% | Poor (n=115) 81% | (142) 100% |
| 2 | Overall Attitude of attendees toward diabetes diet. | Positive (n=59) 41.5% | Negative (=83) 56.5% | (142) 100% |
| 3 | Over all Practices of patients related diabetes diet. | Good (n=25) 17.6% | Poor (n=117) 82.5% | (142) 100% |

***Overall Knowledge of the Participants about the Diabetic Diet***

The Fig 1 indicates that only 19% (n=27) were having good knowledge about the diabetic Diet. They answered 8 or more correct responses. Remaining 81% (n=115) participants answered less than 50% correct responses and were having poor knowledge about the diabetic diet as shown in the table 5 and graph below.

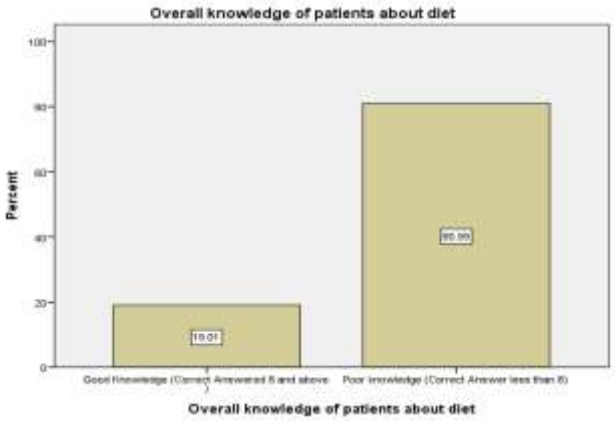


**Fig. 1**: Overall knowledge of the participants about the diabetic diet

***Overall Attitude of the Participants about the Diabetic Diet***

The overall findings suggests that 41.5% (n=59) agreed with the importance of diabetic diet while the remaining 58.5% (n=83) disagreed with the concept of diabetic diet, as shown in Fig 2.

***Overall Practice of the Participants about the Diabetic Diet***

The findings also revealed that only 17.6% (n=25) were having good practice about the diabetic Diet. They answered 50% and above correct responses. While the others 82.4% (n=117) participants answered less than 50% correct responses and were having poor practices about the diabetic diet as shown in the Fig. 3.

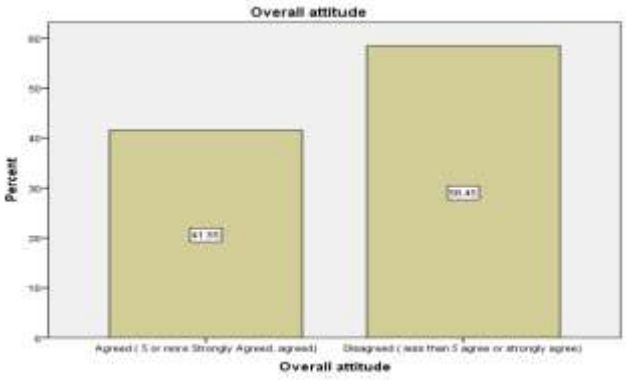


**Fig. 2:** Overall attitude of the participants about the diabetic diet

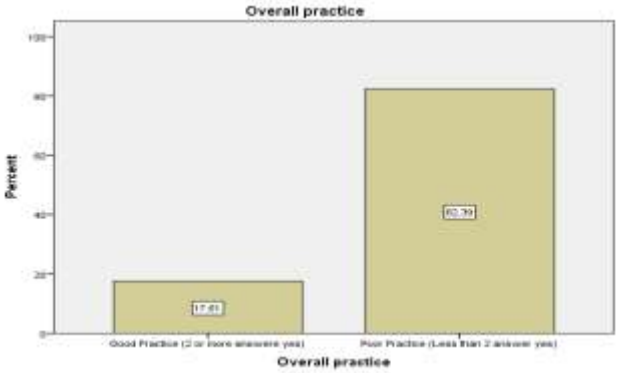


**Fig. 3:** Overall practice of the participants about the diabetic diet

***Association of Gender with Knowledge of Diabetic Diet***

Since P-value (0.006 i.e. <0.001) is less than 0.05 therefore there is a significant association of gender with knowledge of diabetic diet.

**#Chi-Square Tests**

| | Value | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---|---|---|---|---|---|
| Pearson Chi-Square | 3.043[a] | 1 | .081 | | |
| Continuity Correction[b] | 2.234 | 1 | .135 | | |
| Likelihood Ratio | 2.829 | 1 | .093 | | |
| Fisher's Exact Test | | | | .132 | .071 |
| Linear-by-Linear Association | 3.021 | 1 | .082 | | |
| N of Valid Cases | 142 | | | | |

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.51.
b Computed only for a 2x2 table

**##Knowledge KMO and Bartlett's Test**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .758 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 714.455 |
| | Df | 120 |
| | Sig. | .000 |

**##Attitude KMO and Bartlett's Test**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .491 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 23.301 |
| | Df | 3 |
| | Sig. | .000 |

**##Practices KMO and Bartlett's Test**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .650 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 263.561 |
| | Df | 28 |
| | Sig. | .000 |

***Association of Education with Knowledge of Diabetic Diet#***

Since P-value (0.08) which is greater than 0.05 therefore there is no significant association of education with knowledge of diabetic diet (see above Table #).

***Convergent Validity (Bartlett's test)##***

By using the principle component with varimax rotation factors analysis was performed. In the questioner there were 34 total items. Validity of knowledge, attitude and practices was checked. The value of Bartlett's test should be significant so all items fulfill the criteria (see above Table ##).

## Discussion

A total of 142 Questionnaires out of 159 were included for final analysis. The demographics of the participants indicate that the clinic has mostly male as (n= 81) 57% then females (n=61) 43% and most of them were older than 48 years (n=92)64.8%. This is similar to findings in other study conducted from July – August in 2009 a saurashtra region, Government medical College of Bhavnagar Gujarat hospital, found that out of (79.33%) fifty five percent male participate in this study and average age of attendees was between 50 -59 years .Detail of age distribution, gender, education level, marital status and other demographics shown in Table1.

Literatures were searched on published work regarding dietary knowledge, attitude and practices of diabetes type 2 patients. There were different studies found in different countries of the world but in Pakistan there were few studies on stated topic. A study at Pune city indicated that (47.41%) respondents had average knowledge and (43.42%) patients had poor knowledge regarding diabetic diet in the current study only 19% (n=27) were having good knowledge about the diabetic diet. They answered 8 or more correct responses. Remaining 81% (n=115) participants answered less than 50% correct responses and were having poor knowledge about the diabetic diet as shown in the table #5 and graph no.5.36.

A researched indicate that positive attitude of respondents towards the sugar cannot be used by diabetic patients is (83%) and (68%) participants have a good behave regarding the special food should be used by diabetes type 2 patients. There is little bite difference between the literature and current study form the current study there was 41.5% (n=59) agreed with the importance of diabetic diet while the remaining 58.5% (n=83) disagreed with the concept of diabetic diet.

According to Shah *et al*. (2009), 40% patients were calculated the practices regarding diet found that doing right practices. Another study identified the patients dietary practices, Mean and Standard deviation of patients practices was 53.33% +23.68%, respectively. In the current study

findings also revealed that only 17.6% (n=25) were having good practice about the diabetic Diet. They answered 50% and above correct responses. While the others 82.4% (n=117) participants answered less than 50% correct responses and were having poor practices about the diabetic diet.

On statistical analysis P-value (0.08) which is greater than 0.05 therefore there is no significant association of education with knowledge of diabetic diet. Therefore there is a significant association between gender and dietary knowledge as P-value (0.006 i.e. <0.001) is less than 0.05, so null hypothesis is rejected and alternative hypothesis was accepted.

The values of Bartlett's test must be more than .60 and should be significant so all items fulfill the criteria. The value of Bartlett's test 16 items of knowledge is .75 with 120 degree of freedom and significant (p=.000). The value of Bartlett's test in attitude items is .491 with the df 3 and significant value (p=.000). The Bartlett's test value in practices items is .650 with df28 and significant (p=.000) value.

## Conclusion

The result of this study indicates the knowledge of the diabetic type 2 patients regarding diabetes diet was not up to mark, the attitude shown by respondents was negative and there was also lack of positive attitude toward the diabetes diet. Furthermore this study shows the participants of this study were not doing good dietary practices at (DMC). Deficit knowledge, less practices and negative attitude of diabetes patients, might increase the burdened of disease on population.

## Recommendations

It is necessary and responsibility of Government and nongovernment organizations to made policies for health education reading diabetes patient's diet. In all government and private setups there should be Special dietitians department for prevention of diabetes related complication, preparing diet plans and providing the education regarding the importance of diabetes diet. Electronic media and print should be used for creating awareness regarding the importance of diet among diabetic type 2 patients. It will lead to improve the diabetes outcomes. This study is not confined so, therefore further more studies should be done those exploring factors affecting the dietary practices of diabetic patients and producing awareness among diabetic patients regarding the importance of diet.

## Limitations

Sample size was smaller than calculated this will reduce the generalizability and error of margin in this study. To approach the patients for data collection was very difficult patient's relatives and clinics staff help out during data collection the use of interpreter can cause the misrepresentation of information. Few questionnaire filled with present staff at (DMC) it may be sources of bias during questioning answering they may follow that have been taught to patients it may far to reality and oppose the study. In convenience sampling motivated those participants who had positive attitude by leaving those have poor attitude regarding dietary knowledge.

## References

Adem AM, Gebremariam ET, Gelaw BK, *et al*. (2015) Assessment of knowledge, attitude and practices regarding life style modification among type 2 diabetic mellitus patients attending adama hospital medical college, oromia region, Ethiopia. *Int. J. Medical Sciences* and *Pharma Research.*

Al-Asmary AS, Mostafa OSA and Al-Khaldi YM (2013) Diabetic Patients' Knowledge and Practice Regarding Prevention of Diabetic Foot. *The Medical Journal of Cairo University* **81**(2).

Alliance IUN (2011) National Adult Nutrition Survey. Summary report on food and nutrient intakes, physical measurements, physical activity patterns and food choice motives. Ireland: IUNA.

Al-Maskari F, El-Sadig M, Al-Kaabi JM, Afandi B, Nagelkerke N and Yeatts KB (2013) Knowledge, attitude and practices of diabetic patients in the United Arab Emirates. *PLoS One* **8**(1): e52857. DOI: 10.1371/journal.pone.0052857

Association A D (2012) Standards of medical care in diabetes—2012. **Diabetes care 35**(Supplement 1): S11-S63. DOI: 10.2337/dc12-s011

Ayele K, Tesfa B, Abebe L, Tilahun T and Girma E (2012) Self care behavior among patients with diabetes in Harari, Eastern Ethiopia: the health belief model perspective. *PloS one* **7**(4): e35515. DOI: 10.1371/journal.pone.0035515

Basker J, Mammen JA, Sreethu PT, MMahesh NM, Williams F and Chandrashekara P (2016) Assessment Of Diabetic Knowledge And Medication Adherence In Type 2 Diabetes Patients. *Indo American Journal of Pharmaceutical Research* **6**(2): 4479-4491

Davison KA, Negrato CA, Cobas R, Matheus A, Tannus L, Palma CS and Araújo N B (2014) Relationship between adherence to diet, glycemic control and cardiovascular risk factors in patients with type 1 diabetes: a nationwide survey in Brazil. *Nutrition journal* **13**(1): 19. DOI: 0.1186/1475-2891-13-19

Elhassan MR, Gamal HE and Mohammed GS (2013) Nutrition knowledge attitude and practices among students of Ahfad University for women. *Indian Journal of Scientific Research* **4**(1): 25.

Gul N (2010) Knowledge, attitudes and practices of type 2 diabetic patients. *J Ayub Med Coll Abbottabad* **22**(3): 128-131.

Gupta RK, Shora TN, Jan R, Raina SK, Mengi V and Khajuria V (2015) Knowledge, attitude and practices in type 2 diabetes mellitus patients in rural Northern India. *Indian Journal of Community Health* **27**(3): 327-333.

Islam FMA, Chakrabarti R, Dirani M, Islam MT, Ormsby G, Wahab M and Finger RP (2014) Knowledge, attitudes and practice of diabetes in rural Bangladesh: the Bangladesh Population Based Diabetes and Eye Study (BPDES). *PLoS One* **9**(10): e110368. DOI: 10.1371/journal.pone.0110368

Jacobson AM, Wertlieb D, Wolfsdorf J, Herskowitz RD, Lavori P and Bliss RL (2013) Stuart T. Hauser Harvard Medical School, Joslin Diabetes Center. *Emotion, Cognition, Health, and Development in Children and Adolescents* 133.

Kant R and Thapliyal V (2015) Knowledge attitude and practice of type 2 diabetic patients in a tertiary care teaching hospital in India. *Integr Food Nutr Metab* **2**(1): 131-135.

Lesser IA, Gasevic D and Lear SA (2014) The association between acculturation and dietary patterns of South Asian immigrants. *PloS one* **9**(2): e88495. DOI: 10.1371/journal.pone.0088495

Mattei J, Malik V, Wedick NM, Hu FB, Spiegelman D, Willett WC and Campos H (2015) Reducing the global burden of type 2 diabetes by improving the quality of staple foods: The Global Nutrition and Epidemiologic Transition Initiative. *Globalization and health* **11**(1): 23. DOI: 10.1186/s12992-015-0109-9

Micha R, Peñalvo JL, Cudhea F, Imamura F, Rehm CD and Mozaffarian D (2017) Association between dietary factors and mortality from heart disease, stroke, and type 2 diabetes in the United States. *Jama* **317**(9): 912-924. DOI: 10.1001/jama.2017.0947

Mohamed BA, Almajwal AM, Saeed AA and Bani IA (2013) Dietary practices among patients with type 2 diabetes in Riyadh, Saudi Arabia. *J Food Agric Environ* **11**(2): 110-114.

Ntaate, C (2015) Dietary knowledge, attitude and practices of diabetic patients at Nsambya Hospital Kampala, Uganda, Stellenbosch: University of Stellenbosch.

Odenigbo M and Inya-Osuu J (2012) Knowledge, Attitudes and Practices of People with Type 2 Diabetes Mellitus in a Tertiary Health Care Centre, Umuahia, Nigeria. *Journal of Diabetes and Metabolism* **3**: 187-191.

Shah VN, Kamdar PK and Shah N (2009) Assessing the knowledge, attitudes and practice of type 2 diabetes among patients of Saurashtra region, Gujarat. *International journal of diabetes in developing countries* **29**(3): 118. DOI: 10.4103/0973-3930.54288

Wang H, Song Z, Ba Y, Zhu and Wen Y (2014) Nutritional and eating education improves knowledge and practice of patients with type 2 diabetes concerning dietary intake and blood glucose control in an outlying city of China. *Public health nutrition* **17**(10): 2351-2358. DOI: 10.1017/S1368980013002735