

Factors Affecting the Adherence to Dietary Recommendations Among Type II Diabetic Patients

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ABSTRACT

Background: Diet plays an important role in the management of patients with type II diabetes mellitus (DM), and inadequate adherence to dietary recommendations acts as a barrier to controlling blood glucose levels. This study aims to identify factors that affect the adherence to dietary recommendations among patients with type II DM.

Methods: A descriptive study design was carried out at Imam Hussein medical city/Holy Kerbala/Iraq, from the period of October (2015) to June (2021). A non-probability (purposive sample) consists of 100 patients with type II DM, who have at least six months' duration of the disease, and who has attended the outpatient clinic at Imam Hussein medical city. The data were collected by the use of a constructed questionnaire. The data were analyzed through the application of descriptive and inferential statistical analysis procedures by using the statistical package for social science (SPSS) version 24.

Results: The results reveal that more than one half (57.0%) of participants reported they do not know how much of diabetes diet to eat; approximately three quarter (71.0%) of participants documented that it is too hard for them to eat a diabetes diet when they are away from home, and 61.0% of them had economic costs not bear to be their diet separated from their families' food; about two-thirds (63.0%) of patients mentioned that diabetes diet are too unpleasant and they are do not like it; approximately one half (51.0%) of patients stated that there is no need to follow dietary recommendations because they are strictly adherence with diabetes treatment; 70.0% of them documented that a food gathering makes it difficult to follow the dietary recommendations; 64.0% of patients reported that stress conditions caused them to eat unhealthy diet, and 56.0% of them believed that diabetes is out of control whether eating right or not. A significant association was found between these factors and their monthly income, duration of DM, and gender at the p-value of ≤ 0.05 .

Conclusion: Several factors include lack of dietitian's consultation, don't know how much of diabetes diet to eat, economic costs, unpleasant diabetic diet, and unavailability of diabetic diet when it is the time to eat, food gatherings, forgetfulness, the strong desire of hungry, and stress make patients trouble to control of diabetic diet. The study recommends the need to educate patients about dietary self-care management; a booklet should be prepared and given to patients with type II DM as guidance for dietary self-care management.

Keywords: Adherence, Dietary Recommendations, Type II DM.

INTRODUCTION

Type II DM was recognized as one of the main public health problems and the epidemic diseases in the 21st century worldwide, it is considered as the 4th or 5th cause of death in many developed countries [1]. As indicated by the world health organization (WHO) and the International Diabetes Federation, DM has become the primary challenge of health care globally, and a serious public health problem in the Middle East particularly in the Arabian Gulf country [2]. According to the ministry of health (MOH) report/ Iraq in 2017, exposed that DM was determined as the eighth cause of death from the top ten mortality cause in Iraq, and accounting for about 3.79% of the total percent of death in Iraq [3]. Controlling blood glucose levels is the main step in the management of type II DM. This management includes pharmacological and non-pharmacological measures. Pharmacological measures consist of timely and regular intake of medications, non-pharmacological management including dietary recommendations, regular follow-up of blood glucose level, exercising, and daily foot care [4].

Patients' adherence is well known as the level to which patients' behaviors match with their health-related recommendations, it can be measured by the accurateness, consistency, and readiness to comply with the recommended therapy in terms of medications, dietary therapy, and other lifestyle options. Patient non-adherence or sometimes-called non-compliance can take many methods such as misunderstanding of special advice, incorrect application, forgotten, or even being completely ignored [5]. Adherence to dietary recommendations is recognizing to be one of the keystones for the management of patients with type II DM. It is based on the principle of healthy eating in the social situation, psychological and cultural influences on diet choosing. Good diabetes care is a balance between eating a healthy diet, medication, and exercise. The problem, however, is that most patients having difficulties of recognizing the suggested quantity and quality of diet that they have to eat in order to regulate their blood level of glucose [6]. Patients with type II DM are routinely should be counseling to adopt a special dietary modification include changes in their diet

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habits and meal forms for lifelong. However, dietary modification is mainly accompanied by poor compliance, to reaching effective dietary modification for patients with type II DM it is important to realize the factors that affect eating behavior among this group of patients [1].

As indicated by Ebrahim, et al., (2014) that are many influences affecting the adherence to dietary recommendations that are, friends and family, the health care systems, policy, and community [7]. Kassahun, et al., (2016) reported that are many factors affecting adherence to the type II DM dietary plans, that are involved poor awareness, limited time, lack of suitable human power, and most significantly shortage of suitable plans and diabetes teaching for both patients and caregivers [8].

METHODS

Study Design and Setting: A descriptive study design was carried out in the outpatient clinic at Imam Hussein medical city. The study was initiated from 7th October 2015 to 11th June 2021, in order to assess factors affecting non-adherence to dietary recommendations among patients with type II DM.

Population and Sampling: A non-probability (purposive sample) sampling method consists of 100 patients with type II DM, who have at least six months’ duration of the disease, and who have previously received dietary recommendations. Inclusion criteria involve adult clients age over 30 years, those who diagnosed with type II DM, and free from psychiatric problems.

The study instrument and data collection: The researchers developed the study instrument, and then content validity for the instrument was determined through the use of a panel of experts (who have had more than 5 years in the field of experience) to investigate the clarity, relevancy, and adequacy of the questionnaire in order to achieve the study’s objectives. Then the data was collected by the means of interviewing techniques with the subjects who were agreeable to fulfill the questionnaire items. The instrument tools used for data collection in the present study consist of two parts: The first part was used to identify the socio-demographic characteristics of the subjects such as age, gender, marital status, residency, educational level, employment status, and monthly income. It also contains questions about the disease such as duration of DM, family history of DM, smoking status, and body mass index. The second part involved 26 closed-ended questions intended to identify factors affecting non-adherence to dietary regimens among type II diabetic patients. Each item was scored as (1) for disagree, (2) somewhat agree, and (3) for agree responses.

Statistical data analysis: The data were analyzed by using the program of IBM Statistical Package of Social Sciences (SPSS) Version 24. Both descriptive statistical analyses were used to explore various factors affecting non-adherence to dietary recommendations among type II diabetic patients and inferential statistical analysis approaches were used in order to investigate or predicts the relationships between variables. A p-value of ≤ 0.05 was considered statistically significant.

RESULT

Table 1: Distribution of type II DM by their socio-demographic and medical information (n=100)

Socio-demographic characteristics	Frequency (F)	Percentage (%)	Cumulative Percentage %
Age Groups	30-39	3	3.0
	40-49	26	29.0
	50-59	34	63.0
	≥ 60	37	100.0

Gender	Female	57	57.0	57.0
	Male	43	43.0	100.0
Marital Status	Single	2	2.0	2.0
	Widowed	20	20.0	22.0
	Married	78	78.0	100.0
Residency	Rural	11	11.0	11.0
	Urban	89	89.0	100.0
Monthly income	Sufficient	27	27.0	27.0
	Barely enough	47	47.0	74.0
	Insufficient	26	26.0	100.0
Education level	Illiterate	24	24.0	24.0
	Read & Write	17	17.0	41.0
	Primary school	26	26.0	67.0
	Secondary school	19	19.0	86.0
	College graduate	14	14.0	100.0
	Occupation	Farmer	3	3.0
Gainer		20	20.0	23.0
Student		1	1.0	24.0
Housewife		50	50.0	74.0
Employee		14	14.0	88.0
Retired		12	12.0	100.0
Duration of DM		< 5	22	22.0
	5-10	45	45.0	67.0
	> 10	33	33.0	100.0
Family history of DM	Positive	55	55.0	55.0
	Negative	45	45.0	100.0

This table indicates that most (37%) of participants were within the age group of (≥60) years, 57.0 %, 78.0%, and 50.0% of them were female, married, and housewife respectively. In addition to that, most (47%) of them were monthly income barely enough, the majority (78%) of them had diabetes duration for more than five years, and 55% of them have had a family history of DM.

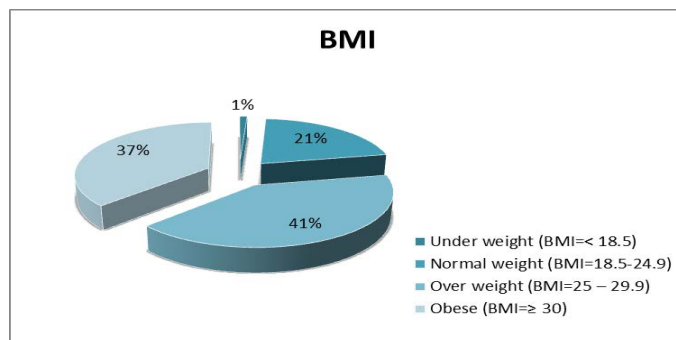


Figure 1. Distribution of participant according to BMI

Figure (1) indicates that most of the sample (41%), (37.0%) having body mass index (BMI) of overweight, and obese respectively, and only (21.0%) of them within normal BMI.

The result in a table (2) indicates a high severity level of many factors affecting non-adherence to dietary recommendations among type II DM enrolled in this study.

This table exposed a significant association was found between factors affecting non-adherence to dietary recommendations with their monthly income, duration of DM, and gender at the p-value of (0.01), (0.01), (0.04) respectively.

Table 2. Statistical result about factors affecting non-adherence to dietary regimen among type II DM (n=100)

No.	Factors	Responses						M.S.	Level
		Agree		Somewhat agree		Disagree			
		F	%	F	%	F	%		
	Not have sufficient knowledge about what dietary plan should be follow to regulate blood sugar.	34	34.0	10	10.0	56	56.0	1.7	M
	Do not know how much diabetes diet to eat.	57	57.0	11	11.0	32	32.0	2.2	H
	Diabetes diet plan are too complicated to understand.	39	39.0	10	10.0	51	51.0	1.8	M
	Lack of dietitian's consultation.	60	60.0	16	16.0	24	24.0	2.3	H
	Not have enough time to prepare diabetes diet at home.	49	49.0	7	7.0	44	44.0	2.0	H
	Not able to prepare special kinds of diabetes diet at home.	53	53.0	4	4.0	43	43.0	2.1	H
	No one help in preparing special kinds of diabetes diet.	42	42.0	4	4.0	54	54.0	1.8	M
	It is too hard to eat diabetes diet when I am away from home.	71	71.0	9	9.0	20	20.0	2.5	H
	Economic costs not bear to be my diet separated from my family food.	61	61.0	7	7.0	32	32.0	2.2	H
	A diabetes diet is too unpleasant, do not like it.	63	63.0	10	10.0	27	27.0	2.3	H
	There is no need to follow dietary recommendations because I am strictly adherence to diabetes treatment.	51	51.0	5	5.0	44	44.0	2.0	H
	I do not think that choosing a diabetes diet is important.	26	26.0	7	7.0	67	67.0	1.5	M
	My family does not think diabetes diets are needed.	14	14.0	14	14.0	73	73.0	1.4	L
	My friends make it hard to follow dietary recommendations.	52	52.0	15	15.0	33	33.0	2.1	H
	Food gathering with family and friends affects my diet and makes it difficult to follow dietary recommendations.	70	70.0	11	11.0	19	19.0	2.5	H
	Stress causes me to eat too much diet.	42	42.0	12	12.0	46	46.0	1.9	M
	Stress causes me to eat an unhealthy diet.	64	64.0	12	12.0	24	24.0	2.4	H
	I believe diabetes is out of my control, whether I eat right or not.	56	56.0	13	13.0	31	31.0	2.2	H
	The strong desire to be hungry makes me have trouble controlling what I eat.	58	58.0	8	8.0	34	34.0	2.2	H
	Feel thirsty forced to drink juices or soft drinks.	43	43.0	10	10.0	47	47.0	1.9	M
	Eat too much because feel pleasure to eating.	40	40.0	15	15.0	45	45.0	1.9	M
	I have too many diseases to take special diet recommendations.	39	39.0	4	4.0	57	57.0	1.8	M
	Sometimes forget to take my diabetes diet.	50	50.0	14	14.0	36	36.0	2.1	H
	I feel physically sicker when I take a diabetes diet.	58	58.0	11	11.0	31	31.0	2.2	H
	Diabetes diets are often not available when it is time for me to eat.	61	61.0	15	15.0	24	24.0	2.3	H
	When my blood sugar is under control, sometimes stop taking my dietary plan.	66	66.0	11	11.0	23	23.0	2.4	H

M.S.=Mean of score; H=High severity factor (M.S. ≥ 2); M= Moderate severity factor (M.S. 1.5-<2); L=Low severity factor (M.S.< 1.5); F=Frequency; %=Percentage.

Table 3. Association between factors affecting non-adherence to dietary regimen and socio-demographic factors of the study sample (n=100).

Socio-demographic factors	Factors affecting non-adherence to dietary regimen	
	P-value	Level of Significant
Age groups	1.0	NS
Gender	0.04	S
Residency	0.09	NS
Educational level	0.1	NS
Occupation	0.1	NS
Monthly income	0.01	S
Duration of DM	0.01	S
BMI	0.08	NS

S = Significant (p-value ≤0.05), NS = non-Significant (p-value >0.05).

DISCUSSION

Controlling of DM is significantly depending on the patient's adherence to medical management; assuredly, the adherence of diabetic patients to dietary recommendations is a very complex issue and need a special attention. A total of (100) patient diagnosed with type II DM was involved in this study in order to evaluate factors affecting non-adherence to dietary recommendations among this type of patients.

Concerning the socio-demographic characteristics of the study participants as shown in table (1), the result indicates that approximately one third (37.0%), and (34.0%) of them were within the age group of ≥ 60 , and 50-59 years old respectively, and about one-quarter of the subject were between the age of 40-49 years old. The female represents more than one-half and the male 43.0% of the study sample. The majority of subjects were from urban residency and was married. In terms of participants' occupation, the result represents that one-half of them were housewives. Regarding the education levels, the results exposed that is 26.0% of them had primary school level and the other 24.0%, 19.0%, 17.0%, and 14.0% were illiterate, secondary school level, read and write, and college graduate respectively. Shamsi, et.al., (2013) conducted a descriptive study to investigate factors affecting dietary management among type II diabetic patients, reported that are out of 400 participants 174 (43.5%) from the age group of 50-59, 52.0% were female, 89.0% were married, 41.0% were housewives, and 31.0% have had primary school level of education [9].

Among patients with type II DM, the result exposed that are most (47.0%), and 26.0% of participants were barely enough and had insufficient monthly income respectively. Taha et al, (2011) reported that are about two-thirds of patients have had sufficient income, and these findings disagree with the findings of our study. According to the result of the present study, the majority of patients confirmed that they have had economic barriers that are preventing them to manage their DM [10].

Furthermore, regarding the clinical characteristics of the study subjects, the results reveal that the majority of patients have diabetes for more than five years' duration, and approximately one-half of them having a family history of DM. Worku et al, (2015) stated the majority of the sample in their study have more than five years of diabetic duration [11]. Shamsi et al, (2013) indicated that are the majority of diabetic patients have had more than five years of diabetic duration [9]. Kassahun, et al. (2016) revealed that about one-quarter of patients have a family history of DM [8].

Regarding the BMI of the study sample as shown in figure (1), the results exposed that are most of the study sample (41%), (37.0%) were overweight, and obese respectively. This result comes along with the findings of a cross-sectional study which was done by Parajuli et al, (2014) to assess factors associated with non-compliance to dietary and physical activity among Nepalese type II diabetes patients, reported that the majority of respondents 48% were obese, and 16% of them were overweight, and (33%) were in normal BMI [12]. A cross-sectional study that was done by Worku et al, (2015) to identify the associated factors of dietary practice among type II diabetic patients in Ethiopia, reported that are 46.4% of the participants were obese and overweight [11].

The results in table (3) indicate a high severity level of factors affecting non-adherence to dietary recommendations among type II diabetes patients enrolled. It is shown that most (57.0%) of patients reported that they do not know how much diabetes diet to eat, approximately two-thirds (61.0%) of them stated that the lack of dietitian's consultation affecting their adherence to their diet. This finding was corresponding

with the results of the study of Kapur et al, (2008) revealed that the majority of patients did not have sufficient knowledge regarding the diets that should be eating and they attribute it to a lack of dietary consultants at the diabetes clinics [13]. A cross-sectional study that was done by Ayele et al, (2018) to evaluate the level of dietary adherence and it is difficulties among type II diabetes patients in the north-west of Ethiopia, mentioned that the majority of patients had insufficient knowledge about their disease and its management, inadequate education about diabetes diet, and lack of awareness regarding the benefits of dietary recommendations [14].

Among diabetes patients involved in this study, the result exposed that about one-half (49.0%) of them do not have enough time to prepare their diabetes diet at home, and most (53.0%) patients do not able to prepare special kinds of diabetes diet at home. Kapur et al, (2008) demonstrated that the majority of diabetes patients reported that they do not have sufficient time to prepare their diabetes foods [13]. From the total patients enrolled in the present study, the majority (71.0%) of participants reported that it is too hard to eat a diabetes diet when they are away from their home, and about two-third (61.0%) of them stated that are having economic costs not bear to be their diet separated from their family food. In addition to that, the result exposed that is 63.0% of patients reported that the diabetes diet is too unpleasant, and they are do not like it. Shamsi et al, (2013) reported that are 31.8% of patients do not like diabetic dietary regimens, and the cost of eating a special diet affects their adherence to recommended dietary plans [9].

Moreover, most (51.0%) of patients stated there is no need to follow dietary recommendations because they were strictly in adherence to diabetes treatment. On the other hand, most (52.0%) of them reported that the patient's friends make it hard to follow a diabetes diet, and the majority (70.0%) of participants documented that food gatherings with family and friends affect their diet and makes it difficult to follow dietary recommendations. Maisharah et al, (2011) reported that are many factors such as social gathering to be a factor influencing the adherence with dietary recommendations among type II diabetic patients [15].

Stress is to be one of the most important factors affecting non-adherence with dietary recommendations among patients diagnosed with type II DM. The results of the present study shown that are the majority (64.0%) of patients reported that stress conditions affect their compliance with dietary recommendations and caused them to eat an unhealthy diet, and most (56.0%) of them believed that diabetes is out of control whether they eating right or not. This result corresponding with the findings of the study of Marcy et al, (2011) reported that psychological conditions such as stress causing patients to eat unhealthy diets and most patients believe that the DM is out of control if they follow the recommended dietary recommendations or not [16]. Didarloo et al, (2014) revealed that is the majority of patients reported that the cost to afford a healthy diet affects their adherence with dietary recommendations, and most of the patients do not believe that the diet can control blood glucose levels, and more than one-half of patients do not remember the recommended dietary plan [1]. Furthermore, the results exposed that most (58.0%) of patients reported that the strong desire to hungry make them trouble to control what they eat, and one-half of them stated that are sometimes forget to take their diabetes diet, also most of them reveal that they feel physically sicker when taking diabetic diet, therefore, do not comply with dietary recommendations. Likewise, the present study clearly exposed that the majority of patients reported that diabetes diets are often not available when it is time for eating and therefore eating every diet accessible or sometimes stop to comply with a dietary plan when their blood sugar level is under control. Worku et al, (2015) revealed that most (42.2%) of type II diabetic patients sometimes stop following

their dietary plan when they feel their blood sugar level under control, and (14.4%) of them stated that are the non-availability of diabetes diet such as vegetables and fruits causing a barrier to them for following the dietary plan [11]. El-Abbassy (2015) conducted a descriptive study to detect the rate of non-compliance to recommended plan among (150) patients diagnosed with type II DM, exposed that more than 33.0% of the subjects involved in the study were not following the healthy dietary plan and the financial barriers, reduced self-control, and the home situation being a reason for non-adherence to dietary recommendations [17]. Akumiah et al, (2017) conducted a cross-sectional study to evaluate the barriers to adherence with dietary recommendations among type II DM patients. This study showed that the main factors affecting adherence to recommended diet among this group of patients were eating outside the home such as in restaurants, or in funerals, and lack of ability to control oneself, in addition to the situation at home [18]. Financial problem also may affect care that are providing by mothers for their children with diabetes [19].

Finally, regarding the association between factors affecting non-adherence to dietary plan and their socio-demographic characteristics, the results revealed a significant association between these factors with their monthly income, duration of DM, and gender at a p-value of (0.01), (0.01), (0.04) respectively, in contrast, there is no significant association between factors affecting non-adherence to dietary recommendations with the other patient's characteristics. AlAbedi and Naji (2020) reported that older adult people who are mentally and physically active can observe to have healthier activities, superior health and quality of life [20]. Individuals must be attentive to their current behavior forms about the importance of managing a disease itself, and related medical problem [21].

LIMITATION OF THE STUDY

The main limitation of the study was that patients self-reported of factors that's affecting their adherence to dietary recommendation, the study is carried out by using purposive sampling methods, thus, the generalization of study result to the different patients in other setting was difficult.

CONCLUSION

Lack of dietitians' consultation, don't know how much of diabetes diet to eat, don't have enough time and don't able to prepare special diabetes diet at home, being away from home, economic costs, unpleasant diabetic diet, and unavailability of diabetic diet when it is the time to eat are the most common factors affecting non-adherence with dietary recommendation among type II diabetic patients. Other factors include food gatherings with family and friends make it difficult to follow dietary recommendations, forgetfulness, strong desire to hungry, and stress make patients trouble controlling their diabetic diet. There is a significant association between these factors with their monthly income, duration of DM, and gender. The study recommends the need to educate patients about dietary self-care management, a booklet should be prepared and given to patients with type II DM as guidance for dietary self-care management. In addition to that, a multidisciplinary practice should be implementing to controlling of DM; and tasks should be dividing into all health care professionals including physicians, diabetic nurses, dieticians/nutritionist, health educator, patients, and their families.

Authorship Contribution: All authors share equal effort contribution towards (1) substantial contributions to conception and design,

acquisition, analysis and interpretation of data; (2) drafting the article and revising it critically for important intellectual content; and (3) final approval of the manuscript version to be published. Yes

Ethical consideration: Approval was achieved from the Scientific Research Ethical Committee at the University of Kerbala/ Nursing College on 14 September 2015 with reference number 1706.98. Likewise, official permission was obtained from the Kerbala Health Directorate/Department of Training and Development in order to perform the data collecting procedure. A consent was attained from each patient who participated in this study, as well as each participant is have the right to be withdrawn from the study at any time.

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Potential Conflicts of Interest: None

Competing Interest: None

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