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Awareness of individuals concerning main causes of diabetes in Kurdistan region

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Abstract--The number of cases of Diabetes Mellitus (DM) has been exponentially increasing with all types of DM among individuals over the past decades around the world. The awareness of individuals about the main cause of DM is an important factor to prevent the major causes and manage the disease regarding the other health issues and risk factors. A cross-sectional study was conducted by using a questionnaire on 22nd-29th April 2021 among the population of the Kurdistan region. The study was aimed to observe the awareness of the individuals in the region with different age groups, education levels, and gender about the main cause of diabetes and regarding the reversibility of DM, the total number of respondents in the questionnaire was (481) participants and consist of two sections. The first section was consist of 3 questions of socio-demographic questions (Age, Gender, Education level) and the second section was composed of the 3 questions (reversibility of DM, the main cause of DM, and knowing anyone with DM). The responses of the main cause of DM that has been obtained was %45.9 (221) Family history, 11.2% (54) Obesity, 10.8% (52) Sweet, 9.8% (47) followed by other factors. In conclusion, about half of the participant's responses about the main cause was family history while based on the studies and evidence that obtained the main cause of most types of diabetes was observed as unhealthy food.

Keywords---Diabetes Mellitus (DM), Awareness, Reversibility of DM, Family History, Unhealthy Diet.

Introduction

Diabetes Mellitus (DM) is recognized as a disorder or a group of metabolic diseases, diabetes mellitus (DM) is derived from the Greek language in which Diabetes means “passing through” or “siphon” and Mellitus means” Sweetened”

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due to the excess glucose level found in the blood along with urine. DM is determined by hyperglycemia resultant of imperfections in insulin secretion and action of insulin or both of them results in hyperglycemia. Hyperglycemia is interrelated to the long-term deflection, failure of numerous organs especially the eyes, nerves, kidney, heart, and blood vessels as well as dysfunction (ADA, 2010).

Many factors are complicated in the development of DM, varied from autoimmune destruction of “pancreatic β – cells” followed by the deficiency of insulin to the abnormal ranges that cause the resistance in the action of insulin of these pancreatic tissues. Lack of insulin action is due to insufficient insulin secretion or weakness of tissues response to the insulin in different points in complex pathways of actions of hormone. The diminished secretion of insulin and frequently occurring imperfections of “insulin action” in the patient (ADA, 2010).

Diabetes mellitus is categorized into four groups Type 1 diabetes, Type 2 diabetes, pregnant diabetes mellitus such as “gestational disease”, as well as diabetes with a specific genetic etiology “monogenic forms” and mainly major burden types of DM are Type 1 and Type 2, Type 2 diabetes properly accounted for the most cases > 85 % of the overall prevalence of diabetes mellitus. Both types of common diabetes may cause multiple system health problems of microcirculatory endpoints, including nephropathy, vision loss, and macrovascular endpoints including ischemic cardiac disorders, strokes, as well as peripheral arterial disease (Forouhi and Wareham, 2019).

The etiology of Type1 is still not fully understood. The understanding of the role of important variables in the cause and etiology of diabetes type 2 makes preventive measures a clear figure for public health (Forouhi and Wareham, 2019). The epidemiological studies have been observed that 422 million people having diabetes mellitus worldwide, 1.6 million people are dying due to diabetes every year, the number of both prevalence and cases as well as death numbers has been increased during the last decades (Lovic et al.,2020).

The increasing burden of diabetes mellitus is a worldwide concern for population health, the studies have been estimated to increase to 629 million people by 2045. These are influenced by the worldwide increase in obesity as well as unhealthy behaviors, such as poor diets or unhealthy and physical inactivity, which, in turn, have been raised by larger societal factors, such as global nutritional variations that can be also the called nutrition modification (Forouhi and Wareham, 2019).

Researches and studies have been represented the data of the study of primary care and dietary recommendations that led to the weight management for reduction of T2MD and the results indicated that nearly half of the participants accomplished therapeutic effect to a non-diabetic state and were no longer taking antidiabetic medications after 12 months. T2MD therapy and reversing is a faithful goal for primary care physicians (Lean et al., 2018).

The study has been shown that the diabetes incidence in high-risk individuals was decreased by both lifestyle modifications and metformin medication.

Metformin is ineffective compared to a change in lifestyle and healthy food consumption (Knowler et al., 2002).

Many studies and evidence have been shown that all plant-based diets such as fruits, vegetables, whole grains, legumes, and nuts, with minimal or no consumption of processed foods as well as animal products, are particularly effective for the prevention and treatment of T2DM (McMacken, 2017). Implementation of both beta-cell and hepatic insulin sensitivity in T2MD has been achieved by restricting dietary energy on its own. It was due to reduced pancreatic and liver triacylglycerol storages. Abnormalities of T2MD seem to be reversible by reducing dietary calorie consumption (Lim et al., 2011).

The nutritional modification study has been conducted to examine the impact of the designed program of nutrition education that is based on each regular energy requirement and system of food exchange unit by using the “Diabetes Mellitus Food Exchange System” at a community of health center. a nutrition training program has been organized with 4 weeks of nutrition training, including two times personal meal as nutritional modification, the 4 weeks nutrition training program has been focused on daily energy recommended and food exchange units by the implementation of the system of food exchange for diabetes mellitus patients that focused on improving the complications of diabetes mellitus in the community health center (Oh and Kim, 2010).

The purpose of the conducted study of the cross-sectional questionnaire was to observe the awareness of the Kurdish population in the Kurdistan region regarding the main causes of Diabetes and the awareness of the respondents about the irreversibility of diabetes, representing the evidence and studies that have been done around the world.

Materials and Methods

Study design and respondents

The cross-sectional study designed in the form of a questionnaire was entitled “what is the main cause of diabetes?” to obtain the data about the first cause that comes in the population's mind about the main cause of diabetes without determination of the type by using Google form, conducted from 22nd to 29th April 2021 by using several platforms such as email, social media, Viber groups among the Kurdistan region population. no exclusion area was available, except for the illiterate respondents that had been helped to fill the form.

Design of the conducted questionnaire

The questionnaire was consisting of 6 questions, the socio-demographic characteristic questions included the sex, age, and educational stage of respondents. The other 3 questions were to know the critical thinking of individuals about the main cause of diabetes? with only one choice and open to additional choice, do they know anyone with diabetes? with multiple choice, and do they think that diabetes is reversible? with yes, no, and maybe options. the

collected data was studied then analyzed by using a Statistical Package of the Social Sciences (SPSS) version 22.

Results

The data were coded then analyzed statistically, the total number of respondents was 481, the questions were divided into 2 sections, the first section was about socio-demographic, the second section was about the main cause of diabetes and other data that related to the general idea of respondents about the disease.

Section 1: Socio-demographic characteristics of the respondents

Regarding gender 71.1% (342) females and 28.9% (139) male, most respondent age groups were between 18-27 that was 63.4% (305) respondents followed by the age group between 28-37 that was 13.5% (65). Regarding education, most respondents belonged to the university or institution with 60.3% (295) respondents followed by Higher education with 22.9% (110) as represented in [Table 1].

Table 1
Socio-demographic characteristics of Participants in Questionnaire

Variables	NO. (%)
Age Groups	
18-27	305 (63.4)
28-37	65 (13.5)
38-47	46 (9.6)
48-57	34 (7.1)
58-67	16 (3.3)
68-77	12 (2.5)
78-87	2 (0.4)
88-97	1 (0.2)
Gender	
Female	342 (71.1)
Male	139 (28.9)
Education	
Illiterate	23 (4.8)
Primary	13 (2.7)
Secondary	14 (2.9)
High School	31 (6.4)
University or Institution	290 (60.3)
Higher Education	110 (22.9)

Results of the second section of the respondents

The results of the second section were shown in [Table 2], the responses of the respondents about the reversibility of diabetes diseases were analyzed among the individuals as most 42.8% (206) think like maybe can be reversed, followed by 25.8% (124) sure about the reversibility and 31.4% (151) no can't be reversed.

Concerning the main cause of diabetes. Most of the responses of the main cause were 45.9% (221) think it is family history followed by 11.2%(54) due to obesity, 10.8%(52) sweet, 9.8% (47) was depression, 7.3% (35) sedentary lifestyle, 6% (29) pancreas, 4.6% (22) fear, 0.6% (3) destiny, 0.6% (3) environment.

About added options by respondents regarding the main cause, 0.2% (1) depends on which type of diabetes that the patient has, 0.2% (1) sweet and fear, and 1% (5) added option as most of the mentioned causes considered as the main causes of diabetes.

The result of do you know anyone with diabetes was like the most responses were Friend with 17.7% (85) followed by 17.2% (83) knowing more than one people with diabetes, and with knowing no one with diabetes was 16.4%(79), followed by 14.1%(68) grandma, 13.5% (65) father, 13.5% (65) mother, 4%(19) grandpa, and 3.5% (17) relatives as shown in the [Table 2].

Table 2
Answer of respondents about the main cause of Diabetes and other variables

Variables	NO. (%)
Reversible	
Maybe	206 (42.8)
No	151 (31.4)
Yes	124 (25.8)
Main Cause of Diabetes	
Age	7 (1.5)
Depends on which Type	1 (0.2)
Depression	47 (9.8)
Destiny	3 (0.6)
Environment	3 (0.6)
Family History	221 (45.9)
Fear	22 (4.6)
Fear and Sweet	1 (0.2)
Meat	1 (0.2)
Most of Them	5 (1)
Obesity	54 (11.2)
Pancreas	29 (6)
Sedentary Lifestyle	35 (7.3)
Sweet	52 (10.8)
Anyone with Diabetes	
No	79 (16.4)
Father	65 (13.5)
Friend	85 (17.7)
Grandma	68 (14.1)
Grandpa	19 (4)
Mother	65 (13.5)
Relatives	17 (3.5)
more than one	83 (17.3)
Total NO.	481

Discussion

The data has been showing that most of the individuals' awareness and knowledge in the Kurdistan region about the reversibility of diabetes is a lack in confidence because maybe option has been chosen the most. Followed by the no option and about one-fourth sure that can be reversed actually, there are many studies and evidence about the reversibility and management of diabetes, especially for T2DM conditions.

Type 1 diabetes is an insulin-deficient and consequently hyperglycemic autoimmune disorder. In the last 25 years, awareness of diabetes type 1 has grown rapidly, leading to a wide understanding of several aspects of the disease, such as their genetic factors, epidemiology, innate immunity and β -cell genetic markers, and prevalence of diseases. Treatments to preserve β cells were tested and many methodologies to improve the efficiency of clinical diseases were

evaluated. still understanding of type 1 diabetes or our potential to standardize healthcare services and solutions to problems and burdens associated with T1DM even now remains (DiMeglio,2018).

Type 2 Mellitus diabetes (T2DM) is an increasing global health concern strongly linked with the obesity epidemic. Type 2 diabetes mellitus is described by carbohydrate, lipid, and protein metabolism dysregulation and abnormalities as well as outcomes in defects in insulin secretion, due to insulin resistance, or a combination of these two (DeFronzo et al., 2015).

Gestational diabetes mellitus (GDM) is characterized by multi-degree hyperglycemia, initially identified during pregnancy. GDM is observed by screening pregnant women for risk factors and testing unusual, but not inevitably moderate and asymptomatic, insulin resistance among at-risk women. GDM resulted from the same variety of physiological and hereditary abnormalities beyond the pregnancy. Evidently, women with GDM are also at large risk for diabetes even when they are not pregnant (Buchanan and Xiang, 2005).

GDM pregnancy nutrition recommendations, which include gestation yield, intake of calories, and composition and consumption of macronutrients, are focused on inadequate science on the impacts on maternal glycemic control as well as perinatal effectiveness. Several other evidence from observational studies claims to support the guideline and recommendations that obese women have medium calorie limitations, although consequences on pregnancy outcome are unknown (Gunderson, 2004).

Assessment and non-randomized statistics indicate that maternal glycemia is continued to improve by lower intakes of carbohydrates, but there is little scientific proof. The studies are generally known about the impact of different GDM healthy eating treatments on pregnancy complications and long-term maternal health e.g. T2DM risk including preservation of postpartum weight (Gunderson, 2004).

Obese adults contribute 1.7 billion adults worldwide, across over 300 million, and are scientifically classified as obese. A body mass index (BMI) is used to define obesity. Obesity has been associated with chronic conditions such as sleep apnea syndrome, hypertension, as well as type 2 diabetes mellitus T2DM (Gill et al., 2010).

These have been developed that in obese people, the failure of β -cells to secrete sufficient amounts of insulin to recompense for insulin sensitivity in peripheral tissues, resulting in type 2 diabetes. Obesity, as well as type 2 diabetes both, increase the risk of coronary heart diseases such as cardiovascular disease and eventual mortality (Gill et al., 2010).

In accordance with the non-randomized clinical trial study conducted in Erbil City about the influence of the Nutrition program on reduction of HbA1c and BMI and reversing T2DM that has been observed that reducing HbA1c as well as decreasing BMI, the T2DM could be reversed and controlled by nutrition education programs (Saadi and Omer,2020).

Concerning the main cause of diabetes, there were different ideas and points of view about the main cause. but most of them think as family history is the main factor and cause of diabetes. the family history is a factor but not the main cause but people with a family history will be more likely to develop diabetes as well as prediabetes. followed by obesity, Sweet, depression, sedentary lifestyle as well as pancreas.

Regarding the studies that have been done about diabetes and risk factors with main causes. the quality of food consumption is the most important point that should be considered because unhealthy food is the main cause of developing diabetes even if you have a family history, individuals with diabetes can reverse their diseases by choosing healthy foods and make a healthy diet as a lifestyle. The options of the question were single choice with add option to observe and evaluate the awareness of the Kurdish population about the main cause that can be the most risk factor to cause diabetes.

The most interested and participant age groups were 18-27 age groups, most of the educational level of respondents was from universities and institutions. Many educational seminars and symposiums can be organized to aware the community and Kurdish people about the risk factors and main causes of diabetes as well as how to manage and reverse the condition, how to chose the best types of food for diabetes patients.

Epidemiological studies have been determined the economic status and cost of diabetes Mellitus appeared to be increased in the developed and undeveloped countries. The average age of patients with diabetes is around 42.5 years and it is due to the high-calorie unhealthy diet, high sugar intake, lack of physical activities, some genetic factors including lifestyle (Tao et al., 2015). The worldwide cost of diabetes has been considered as 1.31 trillion \$ US dollars (Bommer et al.,2017).

The country of Kuwaiti has been recognized as a higher prevalence of diabetes mellitus regarding the study that determined the 20% of the population in Kuwaiti have diabetes (Alhyas et al.,2012). Besides the complications that are related to the significant mortality, many other diabetes-associated morbidities will be a risk factor among the patients. The complications have caused a heavy financial concern among communities due to the significant rate of morbidity and mortality (Alwan et al.,1995).

The awareness of the population worldwide is the most important way to prevent and manage diabetes because diabetes is known as a silent disease many patients became aware of after the appearance of one or more complications including life-threatening. The early detection of diabetes and management of the disease can be improved and accomplished by raising the awareness and knowledge of the individuals (Channanath et al., 2013).

Public awareness programs and empowerment of the patients can have an important role in reversing diabetes and detection of the groups that the priorities should be considered. Public awareness can be achieved by setting programs and assign of health workers, social workers including physicians' assistants that they

can be prepared and trained to determine the high-risk groups of diabetes in the population, the introduction of the education programs by using communicational strategies of attitude and behavior change. Public awareness should be played by all health teams due to the vital role to inspire and motivate patients for change in behavior and awareness of individuals. These programs can reduce the cost expenditure of health care as well as the indirect cost concerning the loss of productivity (Preethikaa and Brundha, 2018).

Concerning the World Health Organization (WHO) report about the training of patients with the program of Therapeutic Patient Education "TPE" to obtain and continuing all required skills that they want for their daily living self-managing of long term and chronic diseases, such as particular diabetes filed. Education has been identified as the systemic plan of intervention participating of the active patients in the making of decisions and self-controlling including monitoring. The Diabetes self-management Education "DSME" involves all the steps that promote the skills, ability, and knowledge of self-care for diabetes patients (Jones et al., 2013).

The Glycemic index (IG) has been defined as the rate of increase of blood sugar after consumption of the food. The concept of the glycemic index has been established at the beginning of the 80s. The studies have been determined the low glycemic index diets can be used as a concept to control and manage diabetes. The most important parameters that have been used to manage and control glycemic index are fasting diet and postprandial blood glucose level (Rahelić et al., 2011).

Conclusion and Recommendations

An overview of diabetes mellitus DM and types of DM has been determined with the importance of the nutrition education program in raising population awareness to prevent developing of the DM and the importance of Diet therapy in management and reversing of the DM especially T2DM has been represented.

The study has been observed that about half of respondents' responses about the main cause of diabetes was family history which most of the people think that the main cause is related to the genetic and family history. The research studies and evidence about the main cause of DM have been represented that DM is related to an unhealthy diet which is a factor of improving and causing DM, while nutrition education programs and clinical trials have been observed to reverse DM.

Most of the participants were not sure about reversing diabetes disease and not aware of it. The nutrition education programs are required to aware people that are suffering from diabetes or have the risk factors to recommend them with healthy diet programs and nutrition modification programs to avoid unhealthy food consumption.

The nutrition program that has been performed Regarding the non-randomized clinical trial study conducted in Erbil city (Saadi and Omer, 2020) to reverse and manage diabetes disease and reduce the blood glucose level among patients, the types of food intake was like: the main part of the meal was consist of the salad

with the different types of the nuts, beans considered as the essential part of the dish of the meal, processed and refined foods has been restricted such as “ rice, bread.

Cheese, biscuits including cakes, the red meat has been recommended to be restricted to one in a month, poultry and fish foods have been recommended to once in a week, and the fruits has been recommended as 3 pieces in a day. The recommended program has been performed for 3 months, by explaining the program for the patients and they have been followed and every detail and changes in their health status have been obtained. The response of the patients to the nutrition program has been associated with the change in the medication status of the patients.

Such nutrition program has been held in the Kurdistan Region, and many other educational and nutritional programs like that required to be performed in the Kurdistan region to raise and improve the knowledge and awareness of the individuals among the Kurdish population to decrease the and reverse the case of diabetes diseases that is a factor to decrease the morbidity mortality rate in the region.

The alteration of the public health nutrition and controlling of the food consumption will lead to an increase in the community health especially the restriction of unhealthy food in the schools to improve the health of kids and organizing educational programs among parents to control the health of new generations in the Kurdistan region.

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