Knowledge, attitudes and practices of patients with type 2 Diabetes Mellitus in respect of non-pharmacological treatment in Holy Karbala City\ Iraq in 2019

A thesis

Submitted to the Council of College of medicine- University of Karbala as Partial Fulfilment for the degree of Higher Diploma in Family Medicine.

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سُورَةُ العَلَقِ

بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

اقْرَأْ بِاسْمِ رَبِّكَ الَّذِي خَلَقَ ﴿١﴾ خَلَقَ الْإِنسَانَ مِنْ عَلَقٍ ﴿٢﴾ اقْرَأْ
وَرَبُّكَ الْأَكْرَمُ ﴿٣﴾ الَّذِي عَلَّمَ بِالْقَلَمِ ﴿٤﴾ عَلَّمَ الْإِنسَانَ
مَا لَمْ يَعْلَمْ ﴿٥﴾ كَلَّا إِنَّ الْإِنسَانَ لَيَطْغَىٰ ﴿٦﴾ أَن رَّآهُ اسْتَغْنَىٰ
﴿٧﴾ إِنَّ إِلَىٰ رَبِّكَ الرُّجْعَىٰ ﴿٨﴾

صدق الله العلي العظيم

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DEDICATION

I dedicated this thesis to my parents who instilled in me the love of learning from an early age and encouraged me to be a doctor.

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Abbreviations	Meaning
AHM	Anti-hyperglycemic medication
BMI	Body Mass Index
CVD	Cardio vascular disease
CAD	Coronary artery disease
DM	Diabetes Mellitus
DSME	Diabetes Self -Management Education
FLP	Fasting lipid profile
HKC	Holly Karbala City
HbA1c	Glycated Hemoglobin
KAP	Knowledge, Attitudes, practices
Mg	Milligram
NICE	The National Institute for Health and Care Excellence
PW-T2DM	Patients with Type 2 Diabetes Mellitus
SD	Standard Deviation
T1DM	Type1 Diabetes Mellitus
T2DM	Type2 Diabetes Mellitus
WHO	World Health Organization

ABSTRACT

Background: Type 2 Diabetes Mellitus is common uncommunicable chronic disease. According to world health organization (2020), 1.5 million deaths are directly attributed to Diabetes. the prevalence increases in Iraq dramatically and ranges from 8.5% (IDF-Age adjusted) TO 13.9%. Around 1.4 million of Iraqis have diabetes, (Kharroubi, A, 2015). Thus, it was necessary to conduct a study to test the researcher's questions that the patients with T2DM in HKC community have inadequate knowledge as independent variables in relation to non-pharmacological treatment of this disease which negatively affect their attitudes and practices in this field and as dependent variables. Also to assess the baseline Knowledge, Attitudes and Practices of T2DM, in non-pharmacological treatment, and to study the correlation between scores of Knowledges, Attitudes and Practices and mean of HbA1c level, BMI and duration of the disease, also the association between knowledge score and some socio-demographic characteristics.

Non-pharmacological choices primarily are a life style management in many aspects, the most known are individualized nutritional management and physical activity, the other aspects are self-management skills through self-education of basic understanding of diabetes (Diabetes Canada website, 2020).

Objectives: This study aims for future effective locally relevant public health interventional programs establishment and to enhance future study about its effectiveness

Methods: A randomized selected cross-sectional study of 200 adult patients with type 2 Diabetes mellitus was conducted from 1st of March to 30th of September 2019 in holly Karbala city/Iraq. Data collected by direct interview through multiple choice-questionnaire. Qualitative and quantitate analysis were obtained by SPSS software version 21.

Results: Mean age was 55.19 ± 9.99 SD. female was 46.5%, and male was 53.5%, 77.5% of participants recognize T2DM as a condition of high blood

glucose, 39.0% recognized it as Chronic disease & lifelong- treatment, 41.0% don't know if it resolved without medications, 58.5% recognizes it as progressive condition with time, 36.5% recognized that both life style modification and Anti-hyperglycemic medications needed as treatment. 85.5% recognized blurred vision, dry mouth and frequency of urination as symptoms. 76.5%, 60.5% recognize retinopathy and nephropathy as complications respectively. 27.5%, 19.5% recognized unhealthy lifestyle and obesity as risk factors respectively. T2DM effect on their daily life, cause multiple psychological effects and suffered different negative works sequelae in 79.0%,47.5%, 56.5% of them respectively. HBA1c mean was 10.52± SD 2.33. Their BMI range from 18.13 – 48.89 kg/M² with a Mean ± SD of 30.72 ± 5.05 kg/M² which indicated the obesity was common between participants.The score for knowledge, regular positive attitudes and practices are 44.1%,48.2%, 39.9% respectively. The Pearson correlation between Knowledge and other confounding factors are positive (gender, level of educations, economic status, crowding index, work and smoking) when P-Value was significant, The Pearson Correlations between knowledge score% and BMI, HbAc1, disease duration are -0.212, -0.246, 0.297 respectively (P-value significant).The Pearson Correlation scores between Knowledge score and positive practices, between Knowledge score and positive attitude score, between positive practice and positive attitudes score are 0.9 (positive) but P-value was insignificant

Conclusions: patients with type 2 Diabetes Mellitus in Holly Karbala city demonstrate Inadequate and deficient performance in Knowledge, practices and attitudes. Data analysis deduced that Increase level of Type 2 Diabetes Mellitus awareness will improve HbA1c levels and decrease BMI.

CHAPTER ONE

INTRODUCTION

INTRODUCTION

1.1 - DIABETES MELLITUS

Type 2 Diabetes Mellitus is a chronic, metabolic disease and it's The most common type of diabetes, which develops when the body becomes resistant to insulin or pancreas doesn't produce enough insulin. Although its usually in adults, Recently, type 2 diabetes mellitus has increasingly been reported in children and adolescents, In the past three decades the prevalence of type 2 diabetes mellitus has risen dramatically in countries of all income levels (world health organization,2020). Diabetes is common, costly condition associated with significant morbidity and mortality (Kharroubi, A, 2015). Recent studies have found dramatic increases in diabetes during last decade (International Diabetes Federation ,2013).

1.2- Epidemiology of Type 2 Diabetes Mellitus.

About 422 million people worldwide have diabetes, the majority living in low-and middle-income countries, and 1.5 million deaths are directly attributed to diabetes each year. Both the cases and the prevalence of diabetes have been steadily increasing over the past few decades (World health organization,2020). The number of people with diabetes had elevated from 108 million in 1980 to 422 million in 2014, prevalence has been increasing more rapidly in low- and middle-income country than in high income countries, between 2000 and 2019(world Health Organization,2020). There was 0.3% increase in age-standardized mortality rates from diabetes in lower-middle income countries, the mortality rate due to diabetes increased 13% (world health organization,2020). The Middle East and North Africa (MENA) region has the second highest rate of diabetes and 9.2% prevalence Between 2017 and 2045, it is estimated that diabetes prevalence will increase by 110% in the MENA region and will reach 629 million worldwide in 2045 year (Abusaib M., et tal.,2020). Arab world countries with the highest prevalence of T2DM, the highest prevalence rate was observed in Gulf cooperation council countries (25. 45%). Around 1.4 million of Iraqis

have diabetes. Reported T2DM prevalence in Iraq ranges from 8.5% (age adjusted) to 13.9%., a local study in Basra, southern of Iraq, reported a 19.7% age- adjusted prevalence of diabetes in subjects aged 19-94 years (Mohammed A., et al.,2020).

The increasing prevalence of type 2 Diabetes Mellitus (T2DM) has put a strain on the health of Iraq's citizens as well as a financial strain on the healthcare system. Not only is it one of a leading cause of death, it also severely affects the quality of life of many citizens leading to years of life lost due to disability. Indeed, the prevalence of TY2DM in Iraq has increased from merely 5% in 1973 to 19.7% in 2012, with nearly 48.8% of the population found to have dysglycaemia (Mansour, A. and Al Douri, F. 2015), In fact, the Middle East contains the highest number of adults living with TY2DM (10.9%) in the world (Kharroubi, A.2015), As a result, many scientific articles now view TY2DM as an epidemic that poses a serious threat to the lives of Iraqi people. The prevalence of Type 2 Diabetes Mellitus is growing within Iraq, as citizens are less likely to participate in physical activity and more likely to adopt a western diet of unhealthy fats, oils, and sugars (Mansour, A. & Al Douri, F. 2015). The World Health Organization (WHO) has directly linked the growing trend of obesity with the increased prevalence of TY2DM (World Health organization ,2020), and described it as an epidemic within developing countries (International Diabetes Federation, 2013). This disease mostly affects adults (but there has been an increasing case seen in children) and can present with less obvious symptoms than TY1DM, causing patients to present later when the disease has progressed to irreversible complications (World Health organization ,2020), Due to this, robust screening programs are essential to detect abnormal blood glucose results before complications have arisen (world health organization,2020).

1.3- Knowledge, attitudes and practices definition

Knowledge possessed by target community refers to their understanding of the given topic, knowledge of non-pharmacological management of T2DM

in this case. Attitude refer to their feeling in this subject as well as to any preconceived idea that they may have toward it. Practices refer to the ways in which they demonstrate their knowledge and attitude through the actions, understanding the knowledge, attitude and practice will enable more efficient process of awareness creation as it will allow the available programs to be tailor made according to the needs of the community (Andrade C., Menon V., Ameen S. and Kumar Praharaj S. ,2020).

1.4- Reasons and Objectives of the study

- **Variables in the study**

The study of evaluation of the Knowledge of T2DM of PW-T2DM in HKC as an independent variable will help the researcher to make conclusions about what are the patterns of attitude and practice as outcome or as a dependent variable which are pursuing by them and to determine if they are appropriate scientifically, the better knowledge of this disease clearly it will have influence on the positivity of their attitudes and practicing habits.

- **Reasons for study**

T2DM is chronic non-communicable disease and consider one of the leading causes of death recently, thus it was necessity a study to test the researcher's questions or predictions that the PW-T2DM in HKC community have inadequate to deficient knowledge in relation to non-pharmacological treatment of this disease which negatively affect their attitudes and practices in this field. This prediction was withdrawn from clinical point view of the researcher though the communications with adult patients who had T2DM during the researcher medical practice at Karbala health centers. The second researcher's question was that if the knowledge, regular positive attitudes, regular positive practices and mean HbA1c parameters are closely correlated.

Therefore, in order to examine these questions, it was necessary to collect and analyze data to approve the accuracy of these predictions.

- **Objective of the study**

the objectives of conducting survey about Knowledge, attitudes and practices of participants with T2DM in Holly Karbala city can be summarize as follows:

- To identify the baseline knowledge, myths, misconceptions, beliefs, and behaviors in relation to non-pharmacological treatment of T2DM.
- To study the correlation between scores of Knowledges, positive attitudes, positive practices and mean of HbA1c levels of the PW-T2DM in HKC.
- To find the correlations between knowledge and other cofounding factors e.g. age, gender, education levels and economic status.
- To understand, analyze, communicate about topics or situation of interest in the field e.g socioeconomic status and its effect, the role of family influence in this case, social effect of the disease on personal life and work and the ideas of participants about the cause of the disease.
- To provide information on needs, issues related to the development of effective locally relevant public health interventions (Andrade C., Menon V., Ameen S. and Kumar Praharaj S. ,2020).
- To enhance future study about the effictiveness of public interventional programs after establishment.

1.5- Knowledge of Type 2 Diabetes Mellitus

The knowledge of patents with type2 diabetes mellitus is of significant value in determination of their health outcome, the chronicity of the T2DM made the patient with this disease to practice new habits and adopt different life style to get the disease under control. The reason for choosing DMT2 in this study is because it's a chronic metabolic disturbance represents a heterogeneous group of conditions which needs a wide range of knowledge acquisition by PWT2DM to get the disease under control level (Tallia, A.,

Scherger, J. and Dickey, N., 2017). The knowledge particularly in DM represents a series with multiple rings attached to each other, one broken ring leads to a deformed series. Knowledge rings of DMT2 involve many aspects and it's not just knowledge about modification of lifestyle, but also knowledge about the disease itself in terms what are the symptoms, risk factors, complications, goals of therapy and glycemic target, as more knowledge PWT2DM gain, the best will be their understanding, cooperation in the disease management.

1.5.1-Knowledge of T2Diabtes Mellitus symptoms

Sometimes DMT2 presents with less obvious symptoms than DMT1 and minority of them may present with common known symptoms of DMT2 include blurred vision, dry mouth, polydipsia, poly urea and fatigue (Masharani U, 2015).This may cause denial of the symptoms by some of the ignorant patients and then these patients may present later when the disease has progressed to irreversible complications which is very costly (Sievenpiper J. et al., 20018) (Alastair Innes J. and Maxwell S., 2016).early screening of DMT2 and awareness of the symptoms of DMT2 by multi- level educations and will halt the serious and debilitating complications from occurrence and decrease financial burden on the level of government, family and person (Alastair Innes J. and Maxwell S., 2016). This is a simple example of the importance of assessing the knowledge of this disease among patients of DMT2.

1.5.2- knowledge about the Complications of Type two diabetes mellitus.

Sometimes when the complications of T2DM apparent clinically either due to late diagnosis or poor management, in this case the treatment will be more difficult because most of the patients particularly in developing countries descend from low socio-economic families which suffer financial barriers to the degree it would be difficult to obtain reasonable treatment to these complications, most of complications are debilitating and disabling the patients, consequently, affecting the quality of life negatively and most

importantly will hinder the patient to obtain the same degree of work in comparison to healthy people and may be un able to obtain one at all or maintain the skillful job already had. Example of T2DM complications is acute visual deficiency due to the retinopathy, stroke, Myocardial infarction due to cardiovascular complications, leg burning or/and numbness due to peripheral neuropathy and renal failure (world health organization,2020). The mentioned complications without adequate health resources or appropriate follow up may end up with imminent death, having said this just to reflect the seriousness of the disease that may end up either with disability or death at early age particularly if they were aggravated by person`s financial barriers and ignorance. Gaining knowledge of complications may promote patients to adhere to non-pharmacological treatment to avoid risky health consequences.

1.5.3- Knowledge of risk Factors associated with Type2Diabetes Mellitus.

some of the risk factors for developing diabetes in future also are available as risk factors for deterioration of the disease when it established. Overweight or obesity, metabolic syndrome (HTN, dyslipidemia), sedentary life style and physical inactivity are risk factors for DMT2(Talia A., Scherger J.and Dickey N., 2017). which if accompanied DMT2 after diagnosis will make the health outcome worse. The management of risk factors are shared responsibility by both non pharmacological and pharmacological therapy. The emphasis in this study about non pharmacological treatment which its goal is to establish and maintain glycemic control, control symptom to a satisfactory level at which person can live normal productive life without interference with their everyday function, achieve optimal control of associated risk factors and finally to prevent or minimize the bad consequences of complications (Manssel and arrason ,2014).

1.5.4-Target of adequate Knowledge, attitudes and practices in non-pharmacological treatment

The target of glycemic control which consider HBA1c as a measure index (Nice.org.uk,2013) and an indicator for its success, is different according to the age of patients and duration of the disease, younger T2DM should be targeted to achieve a HB A1c ≤ 7.0%. Intensive glycemic control of HBA1c <6.5% may be targeted in patient with T2DM with shorter duration of DM and no evidence of significant CVD and long-life expectancy, while the target range (7.1-8.5%) in patient with limited life expectancy, higher level of functional dependency, recurrent of sever hypoglycemia, multiple comorbidities or extensive CAD (Ali Imran S. et al., 2018) (Kim j. and makovozor I.,2017). According to the level of HBA1c, the kind of the treatment can be determined, for example, in newly diagnosed patient whose HBA1c is less than 8.5% lifestyle modification can be appropriate as a first step (Maharani u.2015), while if HbA1c more than 8.5% or DM complication, therapeutic treatment including insulin goes hand by hand with life style modification (Manell K.and Aenson T.2014). Nice guidelines regarding T2DM management 2015, recommend first to give knowledge about disease in addition to increase physical activity and monitoring the diet (NICE guideline 2015).

1.6- NON-PHARMACOLOGICAL TREATMENTS

The non- pharmacological management is not only about healthy life style and physical activity, in fact, this kind of treatment has many aspects involves;

1.6.1-Self- education management

This plays very important role in successful treatment of Diabetic patients in making them a full participant in the Diabetes health care delivery team and ensuring that they can effectively and safely manage their diseases. This step is useful for diabetic patients who have any kind or any

level of education through which makes person at least able to understand what they read. The role of primary care physician is to encourage and direct this education by directing the patient to informative website designated to this purpose, Recent research revealed that development of web-based management knowledge has been shown to improve glycemic control (Ralston JD. et al, 2009) or simply providing them with an explanatory brochure of their disease nature and teach them the ways how they can participate effectively in their treatments.

Regarding illiterate patients, their education should be through well-structured educational program by frequent and continuous counselling. The counselling can be directed to educate both the educated and illiterate patients according to their level of education and understanding through multidisciplinary program at which the following topics should be included:

- A basic understanding of Diabetes.
- The role of diet, exercise and medications.
- How and when to self-monitor blood glucose and why it's necessary.
- Managing of sick days.
- Recognition and treatment of hypoglycemia.
- Knowledge of the major side effects of medications and possible medication adjustments in response to change in diet and activity.
- Care of feet.
- Awareness of risk of heart disease and importance of risk factor control including body weight (Mansell K. and Arnason T. 2014).
- Individualized nutritional management Through well-organized program to provide counselling by a registered dietitian aiming to control overweight and glycemic control.
- establish diabetes program for vulnerable persons with diabetes.

In this program also evaluate the presence of barriers to healthy eating e.g. cost of healthy foods and work toward solution to facilitate behavioral changes (Marcy, T., Britton, M. and Harrison, D., 2011).

1.6.2- OVERWEIGHT & OBESITY

Obesity is now reaching epidemic proportions in both developed and developing countries and it becomes the most prevalent nutritional problem in the world eclipsing the undernutrition and infectious disease as the most significant contributor to ill health and mortality (Lau D. *et al.*, 2007)

One of the important key risk factors for DM type 2 is overweight or obesity which its degree and prevalence varies among different racial groups and socioeconomic status (Masharani U.,2015).

Overweight or commonly assessed using BMI, body mass index (BMI) = weight (kg)/height (m)2 = weight (lbs.)/height (in)2 x 703 (Kim, J. and Mukovozov, I. 2017).

the internationally recognized cut-off BMI values for adults between normal and overweight and obesity is 18.5-24.9 (Brauer, P., et al, 2015). obese status is Unlike with the patients of type 1 DM, weight loss is uncommon in these patients, in facts, the majority of patients with type 2 DM are Obese and may have a strong family history of obesity and DM. (Talia A., Scherger J.and Dickey N., 2017). Obese persons generally consume more energy-dense food > 30% fat daily which tends to be highly processed, micronutrient poor, not only high in fats, but also in sugars, or starch. Only 10-15% of population consume <30% fat daily (Kim, J. and Mukovozov, I.). Insulin resistance is a term related to increased free fatty acid level which occurs in obesity and when coexist with other medical disorder termed "metabolic syndrome" includes Central (visceral) obesity, HTN, Dyslipidemia, fatty liver and polycystic ovarian disease (Alastair Innes J. and Maxwell S,2016). also, this condition leads to high blood sugar and may notice sign and symptoms of diabetes (www.mayoclinc.org).

1.6.3- Healthy life style modification

- **Weight loss**

Weight loss of >5% is clinically significant for reducing many cardiovascular risk factors (e.g. elevated blood pressure, glucose and lipids) (Stevens J., Trusedale KP., Mclain JE., Cai J., 2006). Behavioral interventions for Overweight and obesity require long term commitment to change diet and physical activity habit (Stevens J., Trusedale KP., Mclain JE., Cai J., 2006) and should be offered or arranged greater than 12 months' duration by group and individual sessions particularly for individuals whose BMI >25 through diabetic educational program (Kim, J. and Mukovozov, I. 2017). Additionally, this program direction is to adequately glycemic control as possible and avoiding hypoglycemia at the same time.

- **Diet**

Information on nutrients from all basic food groups help the patients to understand the important role of healthy diet in controlling the weight and blood glucose level, this comes through counselling provision by a registered dietitian on a regular basis. Patients' attendance to nutritional counselling will enable them to understand what kinds of food are suitable for their disease and will clear their confusion that most of the patients have regarding this aspect of treatment. It also familiarizes them how to tailor the distribution of calories and healthy foods intake into meals and snack according to their individual preference, life style and anti-diabetic-medications.

Example of patient's knowledge in nutritional control in diabetes is the understanding the concepts of high index glycemic food.

- **Physical activity**

Sedentary people are more Insulin-resistance than active people with same degree of obesity (Alastair Innes J.and Maxwell S.,2016). Exercise will

improve cardiovascular function, enhance insulin sensitivity and lower blood pressure and lipid level, also helps improve glycemic control in people with T2DM (Kim, J. and Mukovozov, I. 2017).

1.6.5 - FOOT EXAMINATION

A special foot care program for T2DM should be established, which mainly involves;

-Educate of patients how to care about their feet by continuous self-examination looking for injury, ulcers, callus and teach them how to cut their nails with precautions and keep drying feet after each path. Counselling the patient about the neuropathy complication of DM such as loss of sensation and risk of exposing to trauma, the healing speed in any feet injury or ulcer may be less than normal which may expose them to complicated infections like cellulitis, gangrene that most of time end up with amputation.

-podiatric care for careful debridement of corns and calluses that might predispose individuals to foot ulcers. (Talia A., Scherger J. and Dickey N.,2017).

1.6.6 - EYE EXAMINATION

tight glycemic control and hypertension treatment are cornerstone of good eye care. (Talia A., Scherger J. and Dickey N., 2017).

Education of the patients about retinopathy complication as a result of uncontrolled DM, education also include the timing of eye examination by ophthalmologist and optometrist which should be at the time of diagnosis and then each 1-2 years if initially normal (Mansell K.and Arnason T., 2014).

1.6.7 - BLOOD PRESSURE

Education about the recommended target for people with T2DM which should be less than 130/80 mmHg (Clinical Canadian Practice guidelines, 2018).

1.6.8 - SELF MONITORING OF BLOOD GLUCOSE

The importance and the frequency of monitoring blood glucose by using SMBG in T2DM are varies according to the type of therapy. In patients treated with insulin SMBG is especially important and need to be taken both pre and post prandial a minimum of 3 blood sugar measurements per day especially in patient with intensive insulin therapy (Mansell K., Arnason T. 2014). In large non-randomized study of individuals with stable type 2 diabetes using insulin, testing at least 3 times a day was associated with improved glycemic control (Sheppard, P., Bending, J. and Huber, J.,2005), more frequent testing, including pre-prandial and 2-hour postprandial BG (Sheppard, P., Bending, J. and Huber, J. 2005) (Murata, G., et al 2003) and occasional overnight BG measurement are often required to provide the information needed to reduce hypoglycemia risk, including unrecognized nocturnal hypoglycemia (Jones TW, et al., 1998). In contrast, the benefits and optimal timing and frequency of SMBG are debatable for those who are being managed on oral anti-hyperglycemic medications and or life style management, in this case the effectiveness and frequency of monitoring BG in improving glycemic control is less clear (Karter AJ., et al., 2001) (Karter AJ. et al,2006) (Boutati, E. and Raptis, S., 2009) (Farmer A, et al., 2007) and according to national institute for health research (2018) which supports the current guideline recommendations that self-monitoring is not routinely used for people with type 2 diabetes controlled on diet or tablets. The frequency and duration of blood glucose monitoring in patients on oral therapy must be individualized (Mansell K., Arnason T. 2014)., and should be based on factors such as;

- type of oral anti-hyperglycemic agent.

-risk of hypoglycemia.

-presence of concurrent illness.

-to evaluate the new medication.

- to evaluate the dosage change.

Therefore, in stable patient receiving metformin alone and who are at low risk of hypoglycemia and meeting their glycemic targets, routine SMBG may not be necessary. While for medication that curries a high risk of hypoglycemia (e.g. Glyburide or Insulin) or in patient with high risk factors for hypoglycemia (advanced age, renal dysfunction, multiple comorbidities, hypoglycemia un awareness) frequent glucometer readings are necessary (Mansell K., Arnason T. 2014).

To show the effect of SBGM on reduction of HbA1c a series of recent meta-analysis using different methodology and different inclusion criteria, have generally shown a small benefit to reducing A1C in those individuals performing SMBG compared to those who did not (Allemann, S., Houriet, C., Diem, P. and Stettler, C.,2009) (Canadian Agency for Drugs and Technologies in Health,2010) the magnitude of the benefit is small with absolute A1C reductions ranging from0.2% to 0.5%, these analyses demonstrated greater A1C reductions in those performing SMBG when the baseline A1C was >8% (Polonsky W., et al., 2011) (Skeie s., Kristensen G., Carlsen S., Sandberg S., 2009).. SMBG has been demonstrated to be most effective in person with T2DM within 6 months after diagnosis (Malanda UL, Welschen LM, Riphagen 1, et al., 2012), Also of significance, there is no evidence that SMBG affects one's satisfaction, general well-being or general health-related quality of life (Malanda UL, Welschen LM, Riphagen 1, et al., 2012).

Monitoring BG is most effective when combined with an educational program that incorporates instruction for people with diabetes on healthy behavior changes in response to BG values and for health care providers on how to adjust anti-hyperglycemic medications in response to BG readings (Polonsky W., et al., 2011) (Parkin, C. and Davidson, J., 2009).

while recent, well designed randomized controlled trial have demonstration reduction in A1C in the" structured testing program trial" (0.3% P=0.04) (Polonsky W. et al. 2011),(Franciosi M. et al. 2011)(Duran A. et al. 2010)), in

this well-structured testing program people receive intensive education in the role of self-monitoring program and a treatment change recommendation according to it , also in other trial shows that people with type 2 diabetes noninsulin treatment who receive intensive education in the role of self-glucose monitoring of blood glucose and how to modify health behaviors according to SMBG, after 6 months there were significantly greater reductions in mean A1C(-0.5%,p=0.04) and body weight(-4.0 kg, p=0.02) are observed in the SMBG group compared with usual care group (Franciosi M. et al. 2011), another recent evidences demonstrate that SMBG results were used as both an educational tool to promote adherence to healthy behavior modifications as well as a therapeutic tool for adjustment of anti-hyperglycemic pharmacological therapy(Duran A, et al 2010) (Diabetes Canada Clinical Practice guidelines, 2018) (Parkin C. and Davidson J.2009).

1.6.9 - Self management of hypoglycemia

Hypoglycemic reaction is mainly due to medications used by diabetic patients, the most common diabetic medications are insulin and Sulphonylurea. Hypoglycemia is more common in elderly diabetic patients who are on antidiabetic medications and have another comorbidity like renal failure, autonomic neuropathy (Masharani U.,2015).

Symptoms of hypoglycemia started when blood glucose level falls to around 54 mg/DL (3mmol/L) when both sympathetic (tachycardia, palpitation, sweating, tremulousness) and parasympathetic (nausea, hunger) symptoms appear, and when the blood glucose level further drop (to around 50 mg/DL= 2.8 mmol/L) neuroglycopenic symptoms appear, including irritability, confusion, blurred vision, tiredness, headache and difficulty speaking. A further decline in blood glucose level can lead to loss of consciousness and even seizure which require the assistance of other individuals. with repeated episodes of it, Hypoglycemic unawareness may occur which may lead directly to loss of consciousness and seizer (Masharani U.2015). not all symptoms will

be present and some individuals may have other or no symptoms. Frequency and severity of hypoglycemia negatively impact on quality of life (Alvarez-Guisasola F. et al., 2010) and promote fear of future hypoglycemia (Andorra T. et al., A2010). this fear is associated with reduced self-care and poor glucose control (Barnard K. et al., 2010) (Haugstvedt, A., Wentzel-Larsen, T., Graue, M., Søvik, O. et al., 2009) The negative social and emotional impact of hypoglycemia may make individuals reluctant to treatment or to intensify it. As such it's important to prevent, recognize and treat hypoglycemic episodes secondary to the use of insulin and insulin secretagogues. (diabetes Canadawebsite,2020).

Prevention and treatment of hypoglycemia are mostly by non-pharmacological methods through education the patient and his family about the causes and symptoms of hypoglycemia and how to avoid it and manage an emergency cases of hypoglycemia for e.g. holding glucose tablet or parenteral glucagon emergency kit 1 mg and by giving them the proper instructions (Masharani U.2015).Also bring the patients and their family for the importance of wearing an identification medical alert such as bracelet, necklace or carry a card in his or her wallet(www.medicalalert.ca,2020) and this is an example how the non-pharmacological treatment is important in health lives of patients living with T2DM.

1.6.10-Self-management program of patients with Type two diabetes mellitus.

Good Self-management of diabetes can prevent or reduce the risk of diabetic complications (Ghannadi S, Amouzegar A, Amiri P, Karbalaeifar R, 2016) ,The use of Self-management program in chronic disease relatively well known and some of these programs are begin to show success(Chodosh J., Morton S. C., Mojica W., et al. 2005) (Ghannadi S, Amouzegar A, Amiri P, Karbalaeifar R, 2016) , through this program Diabetic patients will taught about non pharmacological therapy which should goes hand by hand with pharmacological therapy, the success index of these both management was

studied by using measurement of HBA1c, lipids, KAP and self-efficacy (Ghannadi S., et al. 2016).while, in Iraq very few study were conducted to evaluate self-management programs among patient with T2DM and variables that effect their Knowledge, practice attitude scores.

1.6.11- Quality of health care in non-pharmacological management of Type 2 Diabetes Mellitus.

The pathogenesis of this chronic disease is progressive worsening insulin resistance and insulin deficiency resulting with time more prominent hyperglycemia which is the most common presentation of T2DM (Masharani U, 2015). The deterioration of chronic process of this disease can be managed and prevented by co-operation between patient and care provider in its early stage. The health care provider' role is to work together with patient to promote the diabetic control by choosing the skillful communications methods in patient-doctor interview or patient-health alliance interview to deliver the best quality care. The type of the quality care given by health care providers is the foundation of self-management support and has been shown to influence treatment outcome in terms of following patient-centered approach through which addressing somatic illness and psychological issues related to this disease itself with the patient (Jones A., et al ,2016), although at the end the successful management of T2DM is contingent upon the person positive direction towards the disease and ability to achieve glycemic control through adhering to a demanding daily treatment regimen consisting of taking medications, blood glucose test by dietary and exercise behavior , loss excessive weight , strict diet and so on (Jones A,, et al ,2016).

1.6.12- Follow up the laboratory works

Conducting the needed laboratory work is an integral part of good non pharmacological management practices because it is a mirror reflects the diabetes mellitus status and detect any change in this status with time. It also

reflects the bodily function e.g. liver, kidney. HbA1c is the most important Laboratory work that needed to monitor both the disease progression and the quality of treatment (NICE guideline 2015).

1.6.13- socio-economic status

it was clear that patients from a lower socioeconomic status, with limited education background, and less access to medical information were more likely to suffer from complications caused by TY2DM as opposed to patients who come from a higher socioeconomic status, were highly educated, and had access relevant knowledge (GOV.UK.2019). The WHO guidelines, (2019) describe the major impact patient's determinants have on their health. These determinants include: the patient's socioeconomic status usually influenced by income and education opportunities; their access to clean water, sanitation, and healthcare; social support networks, family and community; and factors that cannot be controlled such as gender and genetics (World health Organization,2019). The Determinants of Health are essential to think about a chronic disease such as TY2DM.

CHAPTER TWO METHODS

Methods

2.1- STUDY DESIGN

Cross sectional study.

2.2-STUDY SETTING AND DURATION

The data was collected by researcher at the city of Imam Hussein teaching hospital/ Diabetic center and primary Health center in Abassia garbia, Holly Karbala city which is a governorate located in the middle of Iraq. it took Seven months from the baseline from First of March/2019 until the 30th of September/2019.

2.3- SAMPLE SIZE

200 Diabetic type 2 patients were selected by randomized selected sample.

According to Mansor A., et al., (2008), in the cross-sectional study for Diabetes screening in the Basrah, Iraq, the result was concluded that the prevalence of Diabetes Mellitus type 2 in Iraq in adults above 20 years was 7.43%, therefore this Iraqi prevalence (7.43%) was used in calculating Sample size in this study by using the following Simple formula:

$$N = \frac{Z^2 \times P(1-P)}{e^2}$$

n=sample size, Z=Z-score for 95% confidence intervals which is (1.96), e=margin of error (5%), P= expected prevalence obtained from previous similar study (7,43%) (Pourhoseingholi M., Vahedi M. and Rahimzadeh M., (2013).

The total number of patients calculated according to the above equation are 105, but 200 subjects were selected in convenient way to be enrolled in the current study to ensure the sample size is neither small nor large to avoid errors of both cases.

2.4- **A PILOT STUDY:** The main goal of the piolet study was to assess the validity of the idea of the research whether patients with T2DM in HKC truly needed assessment of their knowledge in T2DM and its attitudes and practices in regards of non-pharmacological treatment and in case the idea was accurate whether this study may be needed more ideas to implement or vice Vera then the concept of this study may need to be terminated.

The hypothesis of this study that T2DM patients in HKC had inadequate or deficient knowledge practice attitude in non-pharmacological treatment, I derived this concept from my daily clinical practice in Karbala city health centers, this promoted me to do a pilot study. Pilot study was effective in encouraging me to proceed and accomplish this study to encourage the people in authority to find out a solution for this problem.

The other goal of pilot study is to study the extent of worth pursuing and the quality of asked information in the questionnaire whether it's realistic, or needed further iteration.

Engaging the participants with T2DM to assess both the concept of this study and the quality of the questionnaire help me to get useful feedback from them that I incorporated in the questionnaire form. Within the interview process, I noticed the great influence of family surroundings on PW-T2DM during Pilot study and how it plays a role in the quality of received anti-diabetic management for both therapeutic and non-therapeutic. The family role involves financial support, encouragement, cooperation and sharing decisions about different aspects of Diabetic management particularly the non-pharmacological treatment as it is our concern in this study. Therefore, I added some questions about effect and role of family in the questionnaire.

The duration of the pilot study was 5 days 2 cases every day, the total was 10 cases. 10 cases were conducted in order to ascertain which changes need to be implemented in order to achieve a more robust and varied data pool, these changes are as follows: many patient's economic and psychosocial

needs were unmet due to T2DM, patients with T2DM in HKC couldn't separate their daily suffering of socio economic subjects from their clinical disease as a result, supplementary questions were added to further explore these points, some of the original phrases were rearranged to make it clearer for the patients during the interview process. General demographic information was also collected from each patient to curb any confounding factors that may have arisen due to socioeconomic class, gender, or age. The pilot samples were excluded from the study group.

2.5- ETHICAL CONSIDERATION

Ethical permission was guaranteed from

1- scientific research Committee at the Faculity of Family Medicine and Community / University of Karbala.

2-research Ethical committee at Karbala health directorate.

3- The city of Imam Hussein teaching hospital/ Diabetic center and primary Health center in Abassia Garbia.

4-verbal consent was obtained from each participant; the questionnaire was conducted in private environment as much as possible to ensure their privacy.

2.6- QUESTIONNAIRE FORM

After preparing the questions of the survey which some of them adapted (Fezeu L., *et al* 2010), it should then be validated. The validation should be aimed at assessing their ease of comprehension, uncomplicated, relevant to the internal topics, productive in providing useful information and examine the degree to which the questions are interpreted and understood by different individuals. The domain subjects to assess in the questionnaire was to explore the extent of knowledge of T2DM more specifically the knowledge about non-pharmacological treatment, attitudes and practices of randomly selected populations (k. Kaliyaperumal, 2004). Some questions were added

by research to adapt the nature and habits of Iraqi PW-T2DM, the added questions were about mostly socio-economic status, family support and the effect of T2DM on the work and social life and increase the scope of KAP questions.

The participants asked to indicate the extent to which they agree with those statement on a pre-determined scale by Yes, No, Sometimes The Questionnaire designed to evaluate PW-T2DM in identifying the nature and course of DM, symptoms, complications, risk factors and in assessing different ways of non-pharmacological treatment and the implications of their knowledge in their daily life as practices and attitudes. These include: diet, physical activity, glucometer reading, blood pressure reading, follow-up post laboratory test, prevention of complication, BMI. It also designated to gauge the prevailing attitude, believes and misconception in the population (k. Kaliyaperumal, 2004).The idea, feeling, expectation and effect were all used as assessment tools as well in this questionnaire according to the recent evidence of patient centered medical management, it contains Demographic information, Diabetic history and 54 multiple choices questions in basic diabetic knowledge and 49 multiple choice questions in attitudes and practices (Fezeu L., *et al* 2010). The multiple choices included mostly Yes, No, Some Time answers.

Statements were provided to the Patients and were given by researcher through direct interview to fill out in a face-to-face interview. This method was preferred as most of the patients were found to be unlikely to fill in the questionnaire independently, and needed to be prompted to do so. These interviews were conducted in both official and common Arabic language on Iraqi patients with TY2DM. The researcher estimated the magnitude of effort and time necessary for the implantation of Knowledge, attitudes and practices survey. The findings were compared to internationally set guidelines from medical literature collected from well-regarded journals such as PubMed, NCBI, Medline, and Medscape.

The purpose of questionnaire is to evaluate the baseline of patient's knowledge and the type of undertaken attitude and practice of TY2DM at target population. The results of the survey are then will be used to provide the inputs needed for the design of an effective programs as well as the baseline data for the future evaluation of the success of these programs, this survey may be needed after the implementing of the planned interventional programs to gauge its success. A copy of questionnaire is enclosed with this research.

2.7-Inclusion & Exclusion criteria

The Inclusion criteria included;

- Adult T2DM above 18 years of age.
- Participants who live in Holly Karbala city rural and urban area.
- Male and female T2DM.
- outpatients

The exclusion Criteria included;

- Patients in Emergency room and Critical care unite.
- Participants with T2DM who live outside Karbala.

2.8- Statistical Analysis

Collected data were entered into an excel sheet then transformed into the statistical package for social science program (SPSS software version 21) for further analysis. Descriptive statistics were used to analyze different variables in this study involves analyzing and summarizing data using measures such as mean, median, range, standard deviation and frequency distribution to understand the basic characteristic data sets. Qualitative data were expressed as numbers (Frequency or N) and percentages (%).

The 95% confidence intervals (95% CI) of the mean score were calculated Correlation analysis also was involved to examine the relationship between different variables to make prediction about the future outcome. The

Pearson correlation analysis was performed for analysis correlation of knowledge score with different variables including confounding variables (age, economic status, gender and education level), also determine the extent of the correlation analysis between different categorical and continuous variables. A probability (P value) of less than 0.05 was considered as statistically significant.

2.9- Scoring system of participants' knowledge

The questionnaire was later scored by identifying the percent of PW-T2DM who responded correctly to each multiple choice's question in T2DM knowledge and in its attitudes and practices. Then this percent subdivided into categories of Excellent knowledge, adequate knowledge, Inadequate knowledge and deficiency knowledge. Therefore, cutoff between pass and fail should be assigned and 60% of PW-T2DM was chosen, so if ≥ 60% answered correctly to each question of knowledge, attitude and practice then it will be considered as adequate percent of them have correct answer in the related information and < 60% of PW-T2DM answered correctly to each question, then it will be considered this percent as Inadequate percent of PW-T2DM having correct answer in related information.

Below 60% subdivided to 0.0%-29% of PW-T2DM as deficient P-T2DM who had correct answer and from 30%-59% of PW-T2DM as inadequate PW-T2DM who had adequate answer for each question. Above 60% also subdivided to 60%-79% of PW-T2DM as adequate percent who responded correctly to each answer and 80%-90% of PW-T2DM who responded correctly to each answer as excellent.

The 60% of PW-T2DM as cutoff was chosen gained by more than half of population in order to be adequate otherwise 50% of diabetic patients would have suffer of ignorance if 50% of PW-T2DM would have chosen. Its well understood that cutoff score is a matter of passing and failing an examination. Many resources consider cutoff scores are informed

judgmental based either on individual or collective opinion in other words, cutoff scores are professional judgments that fall somewhere on a continuum between art and science, subjective and objective and arbitrary and reasons (The Glossary of Education Reform,2014). Cutoff scores can vary widely between different schools. The consideration of the cutoff score depends on many determinations: if the test was closed ended question then the guess rate will be high, the difficulty level of the test, weight of the test and what is the examiner expectation of the pass rate (www.optimimassessment.com).The criteria of this qualitative-quantitate assessment that it will provide us with clear idea what kind of medical information is exactly missing and needs to be upgraded or corrected by different strategies.

2.10-Level of knowledge, Attitudes and practices in T2DM.

Level of knowledge, Attitudes and practices in T2DM classified into: 60-79% of them who answered correctly to each multiple choice- question will have adequate knowledge in that answer.

-80%-99% of them with correct answers to each multiple choice- question will have excellent knowledge in that answer,

-While from 30%-59% of them with correct answer to each multiple choice-question will be considered as having inadequate information in that answer, which means there is Inadequate concept of the asked answer.

-0%-29% of them with correct answers to each multiple choice-question will be tabled as sever deficiency in knowledge of that answer. The evaluation is both quantitative and qualitative in nature, by this enable us to identify what kind of diabetes mellitus knowledge exactly that participants have deficiency in it, accordingly, any new management's plan or recommendation should be planned. Sometimes I merged many questions in one topic as seen in the

evaluation table 3.34. The following Figure (2.1) will further explain the idea of Knowledge, practices and attitudes assessment.

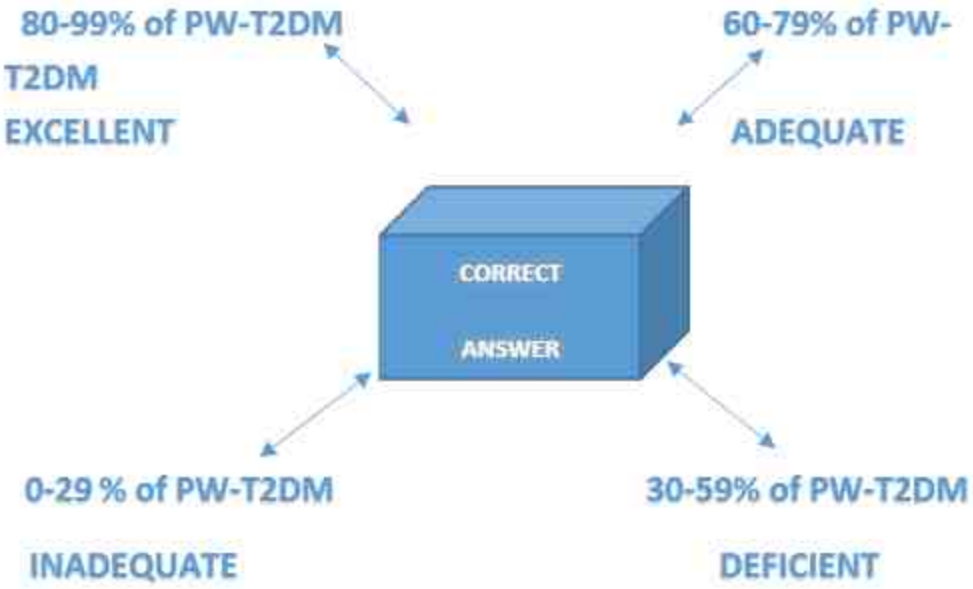

Figure 2.1: show how the method of knowledge, practices and attitude assessment was applied in this study.

2.11- Laboratory works in this study

Most of the laboratory works were collected from patient's charts available at diabetic center and Abbasia garbia health center, including HbA1c%, FBG, RBG, FLP, Retinal screening. RBG results most of the time carried by a piece of paper by PW-T2DM plus its available at the medical charts. HbA1c% and other results some time done at private laboratory and I founded with patients. The date of HbA1c results were done within 3 months of interview meeting time. Same for retinal screening although mostly available at the medical charts but some patients preferred to have it privately and I have to follow up the results with them. Incase if the test was unavailable at the medical charts and the patient admitted he didn't have the test I recorded as not done.

2.12- Notes During Interview when Collecting the Data.

During the interview process, most patients were aware that TY2DM was an uncommunicable disease, that it was progressive, irreversible, and could clearly converse about the chronic nature of the disease. It was noticeable that patients from a low and medium socioeconomic class were less likely to receive their information about TY2Dm from reputable sources such as scientific literature, medically-approved websites and healthcare workers and more likely to draw on their own experiences with the disease. As well, many patients with long-standing TY2DM were only knowledgeable of the consequences that they have already experienced for themselves, and were unaware of other complications that has not affected them yet. These patients may score high on the questionnaire, despite receiving their knowledge only from experience rather than from respected medical literature.

In addition, many patients were unable to give accurate information about the number of episodes of hyperglycemia they experienced and the level of the blood glucose at that time.

The duration of face-to-face interview was different and determined by the educational level of the PW-T2DM, duration of the disease, degree of complications and collaboration to volunteer disease history. Consequently, the interview time between 10 minutes for patient who was knowledgeable with short medical history to one hour in cases where patients have long history of diabetes, Hyperglycemic episodes and complications or in case patients who like to expand about different issues related to diabetes and socio-economic status.

2.13-Difficulties of the study

Some difficulties were faced during collecting of data;

- a few patients unwilling to provide correct demographic information considering it is breakage to the privacy in spite of emphasis of

confidentiality, sometimes names founded different from patient provided than in the charts who submitted later, usually I ignored the incorrect questionnaire and exclude them.

- It was a noticeable trend that a few patients were more willing to give vague answers than admit they do not know the answer to the question. Therefore, these types of patients are also less likely to seek clarification, or ask for help from medical staff, as they are afraid of appearing ignorant.

-Microalbuminuria test was first included in the questionnaire then removed due to difficulty in obtain the result which need 2 specialist approval and during specific time in the noon, most patients unwilling to do it.

-For laboratory works in diabetic center, patients asked to receive the result at noon in summer time, a few of them unwilling to wait, second day they receive the test without submitting it to the center. I have to call them to have the results or to follow up the charts many times. Some patients have their blood tests done at different laboratories ready with them. RBG test is mainly used to assess the glycemic status by patients in diabetic center while specialist in the same center preferred to follow up HbA1c, FBG plus RBG.

-Since the study was cross sectional, the temporal relationship cannot be firmly established because of time limitation and small sample size.

2.14-Study limitation

It was important to ask about demographic information in order to prevent any confounding factors that may contribute to the results. An error that may have arisen in patients filling out the information about socio-economic class within the questionnaire. It was shown that some patients from a higher socioeconomic class were more likely to be vague when answering questions pertaining to their economic status, which can cause misunderstanding between the examiner and the patient. Another error that may have arisen is that some patients may feel unsafe to give information about their lives in regards to demographic information, and may choose to

respond inaccurately. As well, response bias may have been introduced into this study as a few patients may try give false information as they feel pressured by the interviewer to answer a certain way. The way of asking question was open ended questions but at the end the answers have to be yes, No, sometimes clearly. There was also a noticeable language barrier when conducting these interviews, as some patients were unable to understand the official Arabic language and terms, and the questions had to be changed for the common language during the interview.

CHAPTER THREE RESULTS

RESULTS

Sociodemographic information

This research involves adult patient both female and male, their educations, occupations, Marital status, economic status, smocking, and social supports.

The number of participants is 200 adults above 18 years of age and from different age groups the youngest age recorded was 27-year-old and the eldest was 96-year-old, the mean age was 55.19 ± 9.99 SD.
The percent of female was 53.5% and 46.5% for male participants.
Education is an important factor to consider in this research since its strongly associated with self-education in diabetes management that patients with T2DM can obtain through familiarizing their selves through literature or electronic media. 68.5% of the participants are educated, which divides in turn into 3 groups; 29.0% obtained primary degree, 23.5% obtained secondary degree and those participants who obtained university degree are only 16.0%. the Illiterate people withT2DM are 31.5% (Table 3.1).
85.0% of participants are married and most of them have a large family, widows are 13.5% and divorce% is 1.5% (table3. 1).

42.0% of participants were poor as they identified themselves, Intermediate incomes were 58.0%, this was obtained by asking the patients to identify themselves as poor, intermediate or rich. crowing index is another parameter used to assess the economic status of the participants and its figures approximately close the above mentioned, crowing index illustrates poor people percent 44.5%, intermediate people 49% and good 6.9%. American crowding index; measuring the number of persons per room and it considered its crowded if > one person per room, severely crowded if its more than 1.5 person per room (WHO house and Health Guidelines 2018).

Table 3.1; sociodemographic information of patient with type 2 Diabetes Mellitus in the study group.

Variable		Frequency	Percent
Age\ years	18 - ≤ 45	33	16.5
	46-60	112	56.0
	> 60	55	27.5
Gender	Male	93	46.5
	Female	107	53.5
Education	Illiterate	63	31.5
	Primary	58	29.0
	Secondary	47	23.5
	University	32	16.0
Marital Status	Married	170	85.0
	Widow	27	13.5
	Divorced	3	1.5
	single	0	0
Occupation	wage earners\ Free work	73	36.5
	House keeper	89	44.5
	Employee	25	12.5
	Retired	8	4.0
	Handicapped/ Jobless	5	2.5

Continue table 3.1			
Economic status	poor	84	42.0
	Intermediate	116	58.0
Crowding index (person/room)	≤1 good(uncrowded)	13	6.5
	>1 intermediate(crowded)	98	49.0
	>1.5 poor (severely crowded)	89	44.5
Total		200	100.0

Social and economic factors apparently have their direct effect not only on the level and kind of received health care but also on the ability of the patient to follow up the required management's plan. Social support in terms of family is helpful and essential for both psychological and economic assistances for poor patients, nevertheless, people with good economic income needs encouragement, care, some advices and attention of their families.

Age divided in to different categories, the first category was chosen adult to older adult which was age 18 -≤ 45 years due to their less concern about healthy life style modification as usual at this age group or because their disease is in its early course, also other sociodemographic factors like education, works, economy level are vary in this age sector than the older patients whose categories were 46-60 years and older. The researcher concept that at age category of 46-60 years the PW-T2DM may start seriously to adopt healthy style life and modify their usual health habits due to duration of the disease and its complications. At age category of > 60 years the complications of the disease may already started, patients may be disabled accordingly, the life style modification may be already started at this

age. Social and work effects of the disease are more apparent at this age category.

Table 3.2; Family support and Decision makers of patient with type 2 Diabetes mellitus in the study group in respect of non-pharmacological treatment.

Family supporters and decision makers.		Frequency	Percent
Financial and social Family support	Self	83	41.5
	Husband	39	19.5
	Son	44	22.0
	Son & Husband	28	14.0
	Others	6	3.0
	Father	0	0.0
	Mother	0	0.0
	Brother	0	0.0
	Sister	0	0.0
Decision maker	Self	99	49.5
	Husband	47	23.5
	Son	44	22.0
	Shared	10	5.0
Total		200	100.0

Most of people with T2DM in HKC are dependent financially on other member's income in the family (58.5%) and most of them

supported by their sons plus 50.5% of them are unable to make their decisions regarding the ways and cost of their treatments. 23.5% of them considered husbands as the main decision's makers, sons in 22.0%. 5.0% shared decision when diabetic patients involved partially in making decision (table 3. 2). Many issues were highlighted by PW-T2DM during the interview and their focus was mainly on difficult socioeconomic status, the psychosocial impact of the disease and unavailability of an educational programs to upgrade their knowledge. Many patients have admitted that experiencing TY2DM has caused them great financial disruption, and patients from a lower socioeconomic status were less likely to be able to afford medication, glucometers, and strip for glucometers. These patients also felt that it was too expensive to maintain the adequate low glycemic diet necessary for TY2DM, and were more likely to partake in unplanned meals with their family.

Another barrier to self-management that patients spoke about is the lack of knowledge on how to use the glucometers. These patients felt that they were not adequately taught by the doctors, and had to receive their information from the nurses.

Table 3.3; Role of family and economy on type 2 diabetic patient's practices

Questions regarding family support of life style modifications and economic status		Frequency	Percent
Are your family supportive for your treatment's needs?	Yes	96	48.0
	No	63	31.5
	Sometimes	41	20.5
Are your family help in preparing a healthy food for you?	Yes	71	35.5
	No	69	34.5
	Sometimes	60	30.0
Are your family encouraging you for exercising?	Yes	35	17.5
	No	161	80.5
	Sometimes	4	2.0
Are your family encouraging you quit smoking?	Yes	20	10.0
	No	175	87.5
	Sometimes	5	2.5
Does your economic status allow you to buy special foods low in carbs and fat?	Yes	85	42.5
	No	25	12.5
	Sometimes	90	45.0
Total		200	100.0

An assessment was made for the methods of therapeutic choices were used by participants. in the following Pie chart (figure 3.1) which demonstrate whether the patients were on monotherapy or multiple therapies and if insulin included in treatment or they were on life style

modification therapy, this chart will not refer to the names or dosages of medications. The pie chart shows that the percent of PW-T2DM who were using multiple medication therapy or drugs with Insulin are 48.0%,28.0% respectively which indicates although uncontrolled glycemic levels were arranged by multiple medications, their HbA1c levels still were out of target for most of them due to deficiency in practicing life style modifications (only 1.5% of PW-T2DM practicing life style modifications).

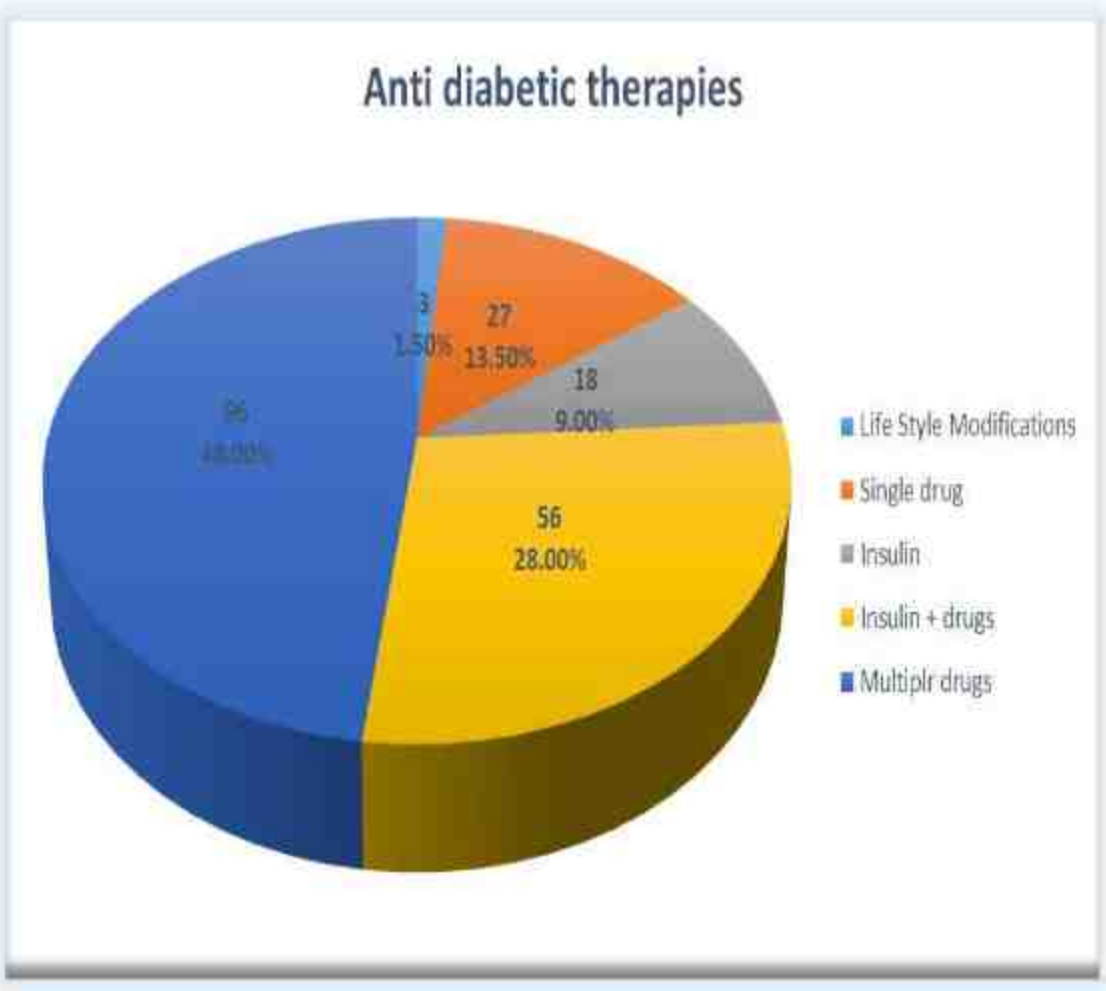

Figure 3.1; The distribution of different methods of therapeutic choices in patient with type 2 Diabetes Mellitus in the study group.

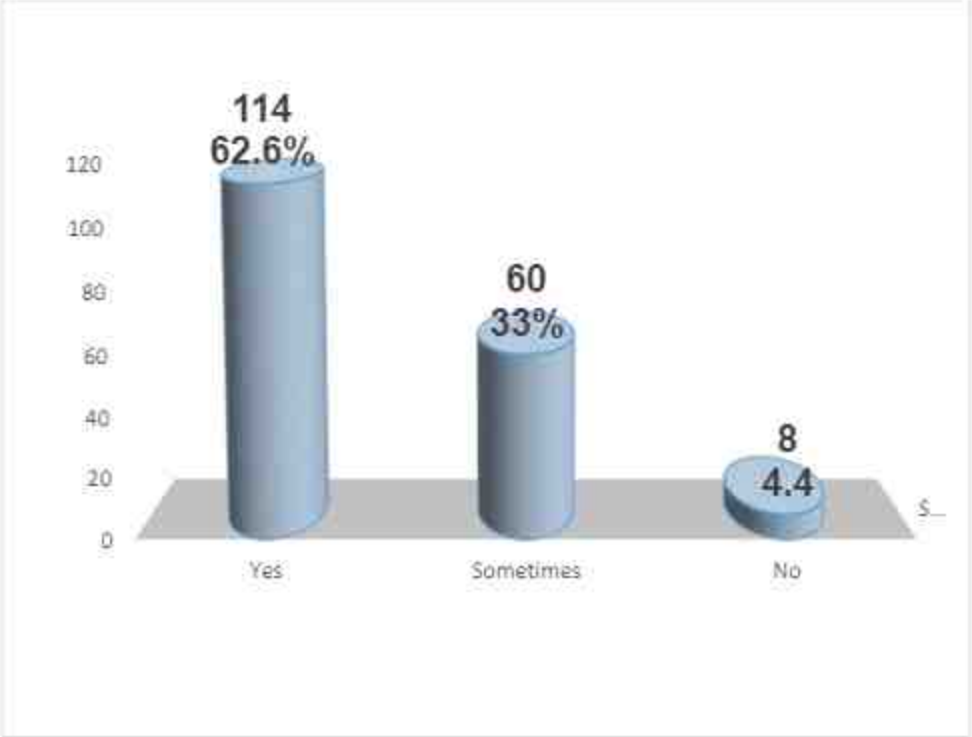

Figure 3.2; Administrational pattern of Anti-diabetic medications in patients with type 2 Diabetes mellitus in study group.

This figure reflects practices of PW-T2DM in terms their commitment to intake of Anti-diabetic medications .33.0% were taken it irregularly and 4.40% no medications intake, this could be explained to many reasons as shown in different table. One of the reasons is their disappointment due to misunderstanding of chronicity of the disease thinking wrongly one course of medications should recover the disease forever, other reasons are due to expensive medications or using alternative therapy (herbal therapy).

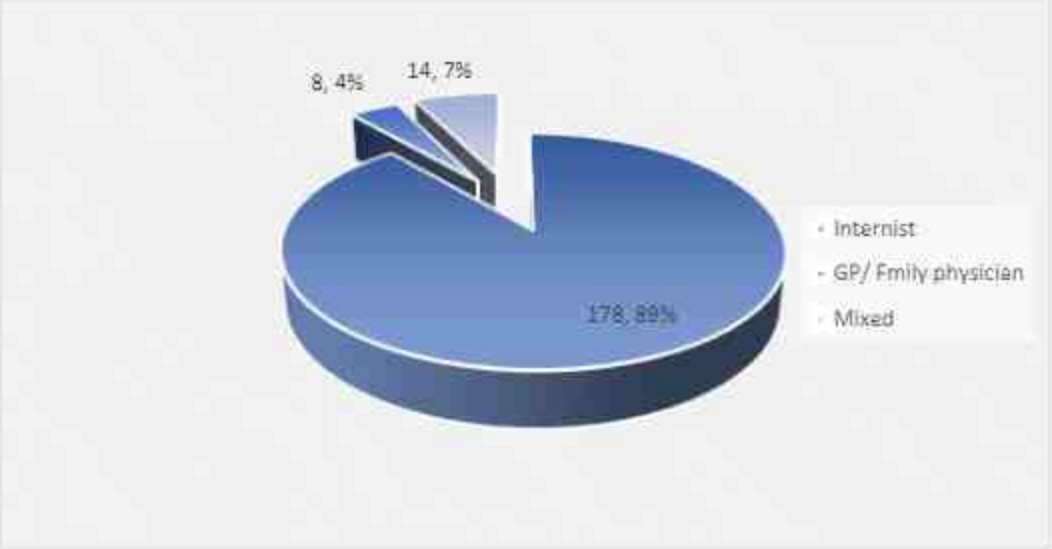

Figure 3.3; The types of medical consultations done by patients with type 2 Diabetes mellitus in the study group.

Internists have the largest share in the percentage of diabetic medical consultations by most of people with T2DM (89.0%). whereas only 8.4% attended primary health care for consultation. This figure points out to the decrease competency of Family doctors (GP) in advanced medicine like endocrinology diseases including DM and patients perceived this fact, therefore PW-T2DM preferred costly internist specialist consultation than unsatisfied cheaper Family doctors (GP) visits in different HKC health center's locations.

Diabetes Mellitus type 2 is common in obese people, the PW-T2DM of this research were mostly either overweight or obese, the obesity is 54.0%, the overweight is 36.5%. According to the statistical analysis in this study for PW-T2DM the BMI range from 18.13 – 48.89 kg/M² with a Mean ± SD of 30.72 ± 5.05 kg/M²). The World Health Organization (WHO) has directly linked the growing trend of obesity with the increased prevalence of TY2DM (World Health Organization, 2020).

Table 3.4; Frequency distribution of Body Mass Index in patients with type 2 Diabetes Mellitus in study group.

Body mass index	Types	Frequency	Percent
BMI Kg/M^2	Underweight	1	0.5
	Normal Weight	18	9.0
	Overweight	73	36.5
	Obesity	108	54.0
Total		200	100.0

Table 3.5; smocking status in of patients with type 2 Diabetes Mellitus in the study group.

	Status	Frequency	Percent
Smoking	Yes	53	26.5
	No	147	73.5
	Total	200	100%

Table 3.6; Attitudes and practices of people with Type 2 Diabetes mellitus towards smoking.

Attitudes, Practices		Frequency	Percent
Cessation thoughts	Yes	33	16.50
	No	20	10.00
Total		**53**	**26.50**
Smoking cessation for previous smokers	Yes	24	12.00
	No (still smokers)	29	14.50
Total		**53**	**26.50**

Smocking is a risk factor for HTN which also worsen nephropathy, one of macro vascular complication of T2DM (World health organization, 2019), the percent of participant who were smoking is 26.5% and nonsmoker is 73.5%. The attitudes of 26.5% of smokers varies between individuals who are heavy smokers for long duration and have difficulties to quit smoking due to dependency and life stress as they had mentioned. some of them had thoughts of cessation but needs encouragement and follow up by smoking cessation program.

Table 3.7; The frequency distribution of patients with T2DM in the study group regarding basic T2DM knowledge evaluation.

Questions		Frequency	Percent
A condition of high blood glucose	Yes	155	77.5
	Don't Know	45	22.5
	No	0	0
Insulin deficiency	Yes	53	26.5
	No	2	1.0
	Don't Know	145	72.5
Insulin resistance	Yes	20	10.0
	No	3	1.5
	Don't Know	177	88.5
kidney failure as etiology	Yes	9	4.5
	No	68	34.0
	Don't Know	123	61.5
Chronic disease & lifelong-treatment	Yes	78	39.0
	No	8	4.0
	Don't Know	114	57.0
Short term diseases	Yes	39	19.5
	No	74	37.0
	Don't Know	85	42.5
Resolved without medication	Yes	42	21.0
	No	74	37.0
	Don't Know	82	41.0
progressive condition with time	Yes	117	58.5
	No	16	8.0
	Don't Know	67	33.5

A short course of medication may resolve the condition forever.	Yes	78	39.0
	No	45	22.5
	Don't Know	77	38.5
Insulin treatment may be needed	Yes	75	37.5
	No	8	4.0
	Don't Know	117	58.5
Both life style modification and Anti-hyperglycemic medication as treatment	Yes	73	36.5
	No	46	23.0
	Don't Know	81	40.5
Type 2 Diabetes Mellitus is a communicable disease	Yes	1	0.5
	No	166	83.0
	Don't Know	33	16.5
Total		200	100

77.5% of people with T2DM in HKC identified Diabetes as a condition of high blood glucose but the percent was low in regard to the pathophysiology of the disease. 26.5%, 10.0% of them had correct answer for insulin deficiency and insulin resistance respectively as causes for development of diabetes. The correct answers for the question to recognize diabetes as a chronic that needs treatment for life long was marked by 39.0% of people with T2DM in HKC. 58.5% of people think diabetes is a progressive disease while the rest either don't know (33.5%) or disagree (8.0%), the rest of the results are shown in the table and discussed further in discussion subject

In table 3.8, 87.0% had correct answers for Blurred Vision and 87.5% had correct answer for frequent thirsty too. 75.5% of them were correct for feeling tired and irritable as symptoms of diabetes, approximately 62.5% of them recognized pain or tingling in the lower legs or feet are consequence of having diabetes. While uncommon presentation like feeling hungry despite have eaten or have cuts, sores, ulcers that heal slowly are rarely known for them (the percent of PW-T2DM IN HKC got

correct answers are 21.0%, 25.0% respectively), there are areas where their knowledge are inadequate such as 41.5% of them recognize there might be weight changes in the course of the disease and deficient when 41.5% think that possibly PW-T2DM may have all the mentioned symptoms as diabetes effects.

Table 3.8; Frequency distribution in regards to knowledge of patients with Type 2 Diabetes Mellitus about evaluation of common symptoms of disease.

Type 2 Diabetes Mellitus symptoms		Frequency	Percent
Blurred vision	Yes	174	87.0
	No	2	1.0
	Don't Know	24	12.0
Frequent thirst	Yes	175	87.5
	No	1	0.5
	Don't Know	24	12.0
Dry mouth	Yes	175	87.5
	No	1	0.5
	Don't Know	24	12.0
Feeling tired, irritable	Yes	151	75.5
	No	2	1.0
	Don't Know	47	23.5
Constant feeling hungry despite having eaten	Yes	42	21.0
	No	11	5.5
	Don't Know	147	73.5
Slowly healing cuts, sores or ulcers	Yes	50	25.0
	No	4	2.0
	Don't Know	146	73.0
Pain, tingling in the lower extremity	Yes	125	62.5
	No	1	0.5
	Don't Know	74	37.0
weight changes-commonly	Yes	83	41.5
	No	3	1.5
	Don't Know	114	57.0

All symptoms mentioned above	Yes	83	41.5
	No	4	2.0
	Don't Know	113	56.5
	Total	200	100.0

Table 3.9; Frequency distribution of knowledge evaluation of patients in the study group in regards to complications of type 2 Diabetes mellitus

Complications		Frequency	Percent
Blindness (Retinopathy)	Yes	153	76.5
	Don't Know	47	23.5
kidney diseases (Nephropathy)	Yes	121	60.5
	Don't Know	79	39.5
heart diseases (Macrovascular complication)	Yes	69	34.5
	No	2	1.0
	Don't Know	129	64.5
nerve diseases (Neuropathy)	Yes	83	41.5
	Don't Know	117	58.5
Stroke (CVA)	Yes	67	33.5
	No	1	.5
	Don't Know	132	66.0
loss of limb (Amputation)	Yes	47	23.5
	No	2	1.0
	Don't Know	151	75.5
No complications	Yes	38	19.0
	No	74	37.0
	Don't Know	88	44.0
Total		200	100.0

Most people with T2DM recognize only 2 complications of diabetes, 76.5% recognize Blindness and 60.5% recognize chronic renal failure.

Table 3.10; Evaluation of T2DM knowledge in regards to its risk factors of patients with T2DM in the study group.

Risk factors		Frequency	Percent
Family history of DM	Yes	98	49.0
	No	1	0.5
	Don't Know	101	50.5
Unhealthy lifestyle (smoking, unhealthy meals, physical inactivity)	Yes	55	27.5
	No	3	1.5
	Don't Know	142	71.0
Hypertension	Yes	25	12.5
	No	1	0.5
	Don't Know	174	87.0
Obesity	Yes	39	19.5
	No	1	0.5
	Don't Know	160	80.0
Total		200	100.0

The highest percent of people with T2DM who answered correctly to the risk factors questions in Diabetes- Questionnaire are as follow; 49.0% agree having one or more of family members with diabetes as a risk factor, 27.5% understood practicing un healthy lifestyle (unhealthy eating pattern, sedentary life without physical exercise, smoking) is a risk factor for developing T2DM. (table 3.10).

Table 3.11; Evaluation of glucometer monitoring benefits of patients with type 2 Diabetes mellitus in the study group.

Glucometer benefits		Frequency	Percent
Low blood glucose recognition	Yes	178	89.0
	No	1	.5
	Don't Know	21	10.5
High blood glucose recognition	Yes	181	90.5
	Don't Know	19	9.5
Follow up uncontrolled DM	Yes	151	75.5
	Don't Know	49	24.5
provide immediate feedback about the effect of medication	Yes	140	70.0
	Don't Know	60	30.0
provide immediate feedback about the effect of certain kind of food	Yes	138	69.0
	Don't Know	62	31.0
	Total	200	100.0

The highest achieved percent was in question related to the benefit of glucometer usage in recognition Hyperglycemia and it was 90.5%, next was 89.0% for recognition of hypoglycemia. Their answers either yes or don't know and only one patient gave wrong answer by "No" to low blood recognition by glucometer. Other reading in this table is also encouraging and this reflects that people with type 2 diabetes in Holy Karbala city have adequate knowledge about the importance of glucometer follows up and usage.

PW-T2DM IN HKC were tested for four common symptoms of hypoglycemia; tremor and fear, sweating and palpitation, fainting, seizure (lega c., et al, 2018) (Tallia, A., Scherger, J. and Dickey, N.,2017), Inadequate percent of them responded correctly to the first three and deficient knowledge for seizure as shown in Table3.12.

Table 3.12; knowledge in regards to hypoglycemic symptoms in Patients with type 2 Diabetes Mellitus in the study group.

Hypoglycemic symptoms		Frequency	Percent
tremor and fear	Yes	91	45.5
	Don't Know	109	54.5
sweating and palpitation	Yes	104	52.0
	Don't Know	96	48.0
Fainting	Yes	78	39.0
	No	4	2.0
	Don't Know	118	59.0
Seizure	Yes	14	7.0
	No	8	4.0
	Don't Know	178	89.0
	Total	200	100.0

Table 3.13; knowledge of Anti-hyperglycemic medication's side effects in Patients with type 2 Diabetes Mellitus in study group.

Anti-hyperglycemic medication side effect		**Frequency**	**Percent**
Hypoglycemia	Yes	136	68.0
	No	1	.5
	Don't Know	63	31.5
Gastric Upset	Yes	71	35.5
	No	8	4.0
	Don't Know	121	60.5
Change in the body weight	Yes	65	32.5
	No	6	3.0
	Don't Know	129	64.5
	Total	200	100.0

from the survey in table 3.13, it looks Hypoglycemia is known to them (68.0% of people with T2DM correctly marked hypoglycemia), while the last two were unfamiliar to most of them (35.5% of them answered correctly for gastric upset and 32.5% respond correctly for change in body weight.

Table 3.14; Diabetic knowledge in regards to healthy life style, eye exam, foot exam and its complications among patients in the study group.

Questions		Frequency	Percent
distinguish between low and high glycemic and unhealthy fatty food items	Yes	103	51.5
	No	93	46.5
	Don't Know	4	2.0
Regular intake of fruits and vegetables	Yes	31	15.5
	No	2	1.0
	Don't Know	167	83.5
Regular meals	Yes	134	67.0
	Don't Know	66	33.0
Smoking is a risk factor	Yes	64	32.0
	Don't Know	136	68.0
Exercise	Yes	62	31.0
	Don't Know	138	69.0
Ophthalmological consultation	Yes	98	49.0
	No	1	.5
	Don't Know	101	50.5
Foot care	Yes	43	21.5
	Don't Know	157	78.5
Foot ulcer	Yes	40	20.0
	Don't Know	160	80.0
Gangrene as a complication of foot infection in Diabetic patient	Yes	36	18.0
	Don't Know	164	82.0
Importance of special diabetic socks and shoes	Yes	16	8.0
	Don't Know	184	92.0
Total		200	100.0

Healthy life style referred to Diet, exercise, weight control and behavioral therapy (NICE guidelines 2015).

The ability of PW-T2DM to differentiate high carbs or fatty food are only 51.5% of them. The remaining less than half people with T2DM still wondering what kind of food is suitable for them. Noticing the table 3.14 and table 3.20, 15.5% of PW- T2DM know that regularity of administration of a healthy food is must and 18.5% of them involve 3-5 of vegetable servings in their meals and 16.0% of them administer 3-5 fruit servings daily. in fact, the amount recommended in T2DM according to recent studies have shown that higher intake of vegetables (>5 servings /day) and fruit alone (> 4 servings/day) is associated with a decreased risk of cardio-vascular disease and all-cause mortality in diabetic patients (Wang X, Ouyang Y, Liu J, et al.2014), however, 67.0% support the commitment to regular pattern of healthy meals in spite healthy meals meaning is unclear for them. 31.0% of them consider regular exercise is an important lifestyle modification towards adequate glycemic control. Consequently, Only 22.5% of people with T2DM exercise. 49.0% of people with T2DM know that they should examine their eyes by ophthalmologist immediately after have been diagnosed with DM, , for foot self-examination 21.5% got right answer, identification a black line as a gangrene infection 18.0% of them got correct answer,8.0% know that diabetic patients need special diabetic socks and or shoes.

Table 3.15; Frequency distribution of source of educations in the study sample.

EDUCATIONAL RESOURCES	Frequency	Percent
FAMILY & FRIENDS	141	77
SPECIALIST	120	60
ELECTRONIC MEDIA	77	38.5
PRIMARY CARE	67	33.5
PHARMACIST	6	0.03
DIETITIAN	0	0.0
MULTIPLE RESOURCES	138	69.0
SELF-MANAGEMENT EDUCATION	15	13.5
STRUCTURED DIABETIC PROGRAM	0.0	0.0

Most of PW-T2DM had multiple resource of educations (69.0%), in this table the source of education subdivided as many single parameters to see which one is the most effective educational resource in the study group, therefore, the total number will not be sample size 200 due to the repetitions of some resources.

13.5% of People with T2DM in HKC had tried self-management education, without doubt this percent covers well- educated individuals. 0.0% people have attended any structured diabetic program, table 3.15. The highest percent of participants received their disease's instruction and education from their families and friends (77.0%),60% by specialist instructions. The role of primary care limited to 33.5%. this study reveals the fact that high significant role of family and friends impacts on kind of given educations to the PW-T2DM and its consequences on diabetic individual's ideas, feelings and then their practices and attitudes.

58.5% of PW-T2DM know how to monitor BGL using glucometer devices (table 3.16). 18.0% record measurement of BGL before meal, and 17.5% measure BGL after meal, 48.5% check their blood glucose before and after meals. 16.0% don't have a clear strategy.

Table 3.16; Frequency distribution of the attitude and practice of the patients in the study group.

Attitudes & practices status		Frequency	Percent
Self-management education	Yes	27	13.5
	No	103	51.5
	Sometimes	70	35.0
Attendance of well-structured program about DM	Yes	0	.0
	No	200	100
Knowledge in self-monitor of blood glucose by glucometer	Yes	117	58.5
	No	83	41.5
Timing of glucometer use with meals	Non applicable	32	16.0
	Before meal	36	18.0
	After meal	35	17.5
	Before and after	97	48.5
Regular follow up of glucometer readings	Yes	77	38.5
	No	62	31.0
	Sometimes	61	30.5
Total		200	100.0

Table 3.17; Blood pressure instrument owners in the study group.

	Status	Frequency	Percent
blood pressure instrument owner	Yes	53	26.5
	No	147	73.5
Total		200	100

Only 26.5% of PW-T2DM IN HKC have their own blood pressure devices while 73.5% of them don't have it, those who don't have it measure their blood pressure at nearby health facilities or using some clinics run by nurses.

Table 3.18; Hypoglycemic and Hyperglycemic episodes faced previously by patients with Type 2 Diabetes mellitus in the study group.

		Frequency	Percent
Previous Hypoglycemic episodes	Yes	64	32.0
	No	136	68.0
Total		200	100.0
Previous hyperglycemic episodes	Yes	145	72.5
	No	55	27.5
Total		200	100.0

the high carbohydrate content of Iraqi meals makes hypoglycemia less common than other countries, 32.0% of PW-T2DM IN HKC had faced hypoglycemia previously.

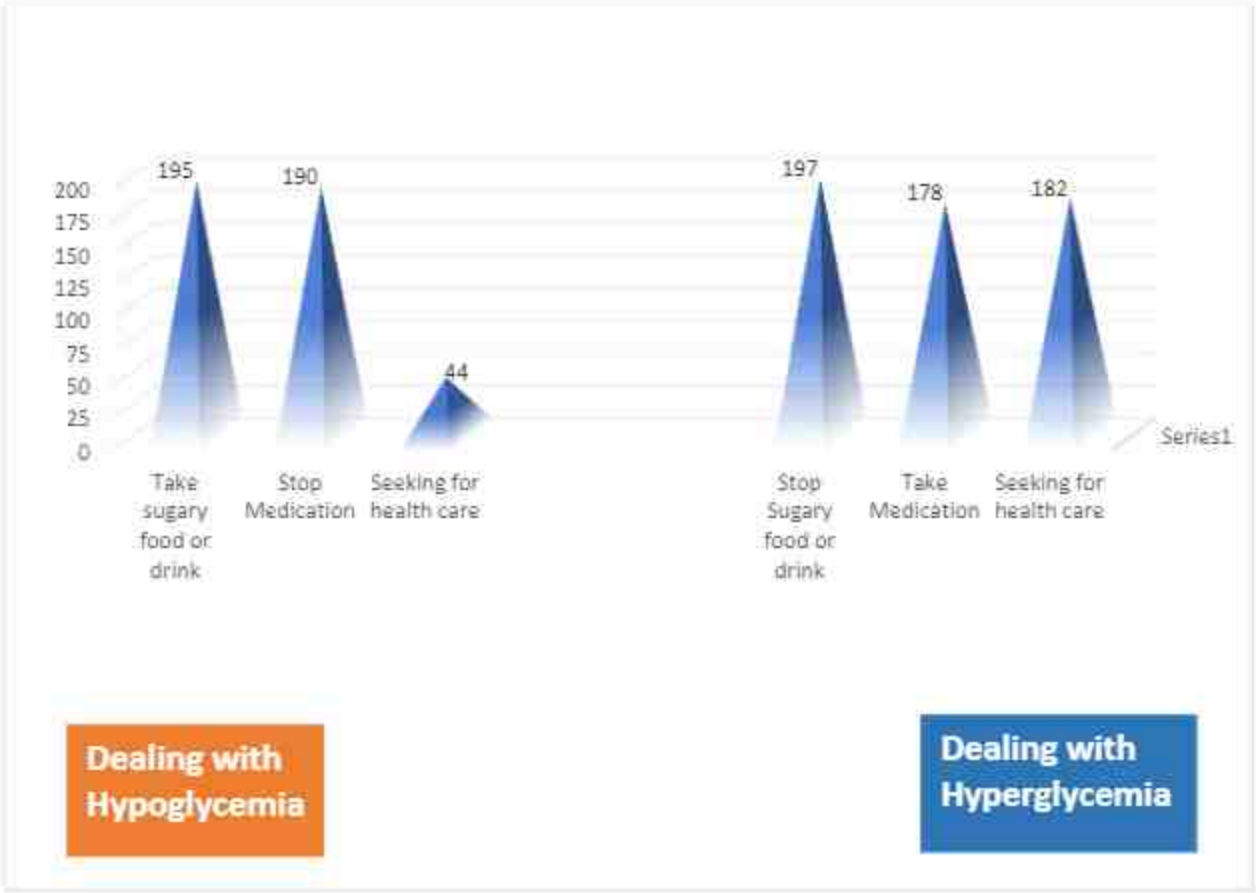

Figure 3.4: practices of patients with type 2 Diabetes Mellitus in the study group in case hypoglycemic or hyperglycemic episodes.

The number of PW-T2DM seeking health care in hypoglycemia (44) is less than the one for hyperglycemia (182) is due to high carbohydrate content of Iraqi foods which ends hypoglycemia in its early stage and easy to deal with hypoglycemia than the hyperglycemia gaining the experiences from long duration of the disease.

Table 3.19: Healthy life style Practices and medical consultation among patients with type 2 Diabetes mellitus in the study group.

Practice		Frequency	Percent
Trying weight control	Yes	47	23.5
	No	153	77.5
Immediate medical consultation when symptoms and complications of DM develop	Immediately	123	61.5
	Within month	67	33.5
	Within year	10	5.0
Exercise practicing	Yes	45	22.5
	No	152	76.0
	Sometimes	3	1.5
Total		200	100.0

Un knowing of overweight or obesity as a risk factor in Diabetes Mellitus, only 23.5% of people with diabetes tried to lose weight while 77.5% didn't. the most mode to control their body weight, was through exercising (14.0%), second to it was by herbal therapy (11.5%), calorie count was 11.0%, 10.5% through medical consultation and 6.5% for using multiple methods. Their BMI range from 18.13 - 48.89 Kg/m2 with a mean ± SD of 30.72 ± 5.05 Kg/m2. Notably the percent of overweight is 36.5% and obesity is 54.0% according to Body Mass Index.

43.5% of people with T2DM are considering their eating pattern healthy. 63.0% of them usually daily vegetable intake is 1-2 serving, 18.5% have 3-5 vegetable serving each day. Herbal medicine is so popular in HKC that clearly 61.5% are using it as alternative therapy, (Table 3.20)

Table 3.20; Practices in regards to pattern of healthy meals and attitudes for alternative treatment among patients with Type 2 Diabetes mellitus in the study group.

Practices & Attitudes		Frequency	Percent
Are you considering you're eating pattern healthy	Yes	87	43.5
	No	40	20.0
	Somewhat	73	36.5
how many serving of vegetables per day	0	37	18.5
	1-2	126	63.0
	3-5	37	18.5
how many serving of fruits per day?	0	53	26.5
	1-2	115	37.5
	3-5	32	16.0
Involvement of multigrain bread in meals	Yes	46	23.0
	No	93	46.5
	Some times	61	30.5
Do you avoid fatty food or fast processed food?	Yes	74	37.0
	No	51	25.5
	Sometimes	75	37.5
Do you avoid high carbohydrate food?	Yes	117	58.5
	No	29	14.5
	Sometimes	54	27.0
Do you count your Calorie input?	Yes	3	1.5
	No	193	96.5
	Sometimes	4	2.0
Are you considering alternative treatment for DM	Yes	123	61.5
	No	76	38.0
	Sometimes	1	.5
Total		200	100.0

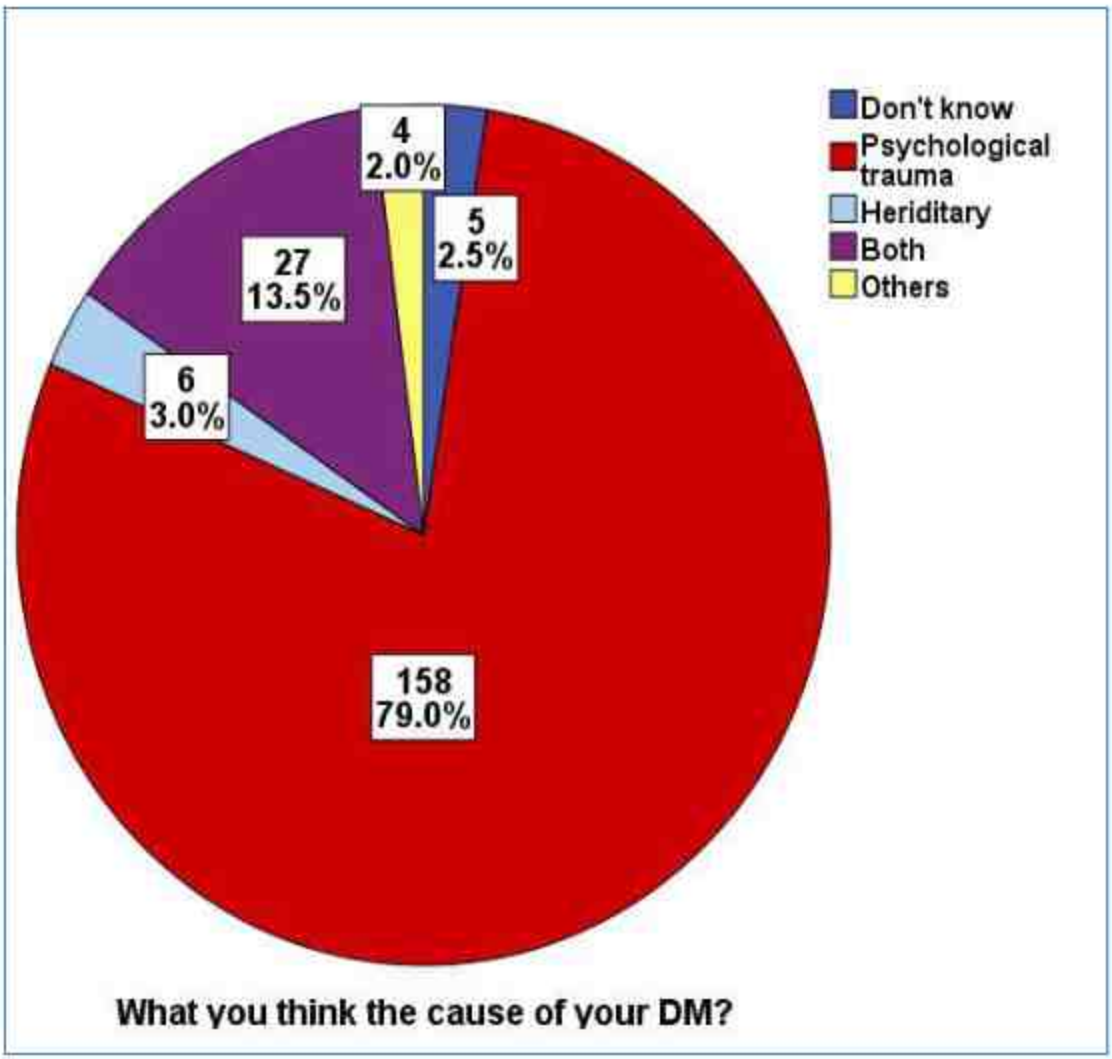

Figure 3.5: Frequency distribution of the Idea of Patients with type 2 Diabetes Mellitus about the etiology of the disease.

79.0% of PW-T2DM IN HKC thought that the etiology of the Diabetes Mellitus is due to psychological trauma solely, in other wards they explained by suddenly getting diabetes symptoms and then had been diagnosed of having it immediately after exposure to psychological trauma particularly the severe one. 3.0% of them think its hereditary due to the availability of other family members having Diabetes. Some joined between the family history of diabetes and their exposure to hard social circumstances as a contributor to their effecting with Diabetes and those are 13.5%. .People from a strong

educational background were more likely to understand that the disease was caused by a persistent state of hyperglycemia.

Highest percentage of PW-T2DM were admitted due to multiple complications of diabetes, the rest of participants (55.5%) have no admissions to hospitals although they are suffering different complications including retinopathy 13.0%, foot ulcers, frequent fungal skin infection or frequent UTI, chronic flue, dyslipidemia, and depression.

Table 3.21; Frequencies distribution of f Hospital admissions and the causes of admissions among participants of Type 2 Diabetes Mellitus.

		Frequency	Percent
Hospital Admission	Yes	89	44.5
	No	111	55.5
Total		200	100.0
Reason	Hyperglycemia	57	28.5
	Coronary heart Disease	10	5.0
	Stroke	4	2.0
	Hypoglycemia	3	1.5
	multiple causes	15	7.5
Total		89	44.50

Table 3.22; Some complications of type 2 Diabetes Mellitus of T2DM patients of the study group.

Complications of type 2 Diabetes Mellitus		Frequency	Percent
Urinary tract infection	Yes	23	11.5
	No	177	88.5
Chronic flue	Yes	4	2.0
	No	196	98.0
Fungal infection	Yes	6	3.0
	No	194	97.0
Foot ulcer	Yes	7	3.5
	No	193	96.5
Other	Yes	18	9.0
	No	182	91.0

Table 3.23; Accomplished laboratory work of HbA1c, RBG, FBG done by patients with Type 2 diabetes Mellitus in the study group.

Blood test	Number	Minimum	Maximum	Mean	SD
HbA1c	147	5.90	19.39	10.52	2.33
Random blood sugar	167	61	535	297.64	86.21
Fasting blood sugar	99	120	435	242.98	69.93

In this study 73.50% their HbA1c is out of target. The available HbA1c% lab works of PW-T2DM IN HKC demonstrate that the mean of their HbA1c% is 10.52 ±2.33 SD.

Figure 3.6: Frequency distribution of HbA1c% in the study group.

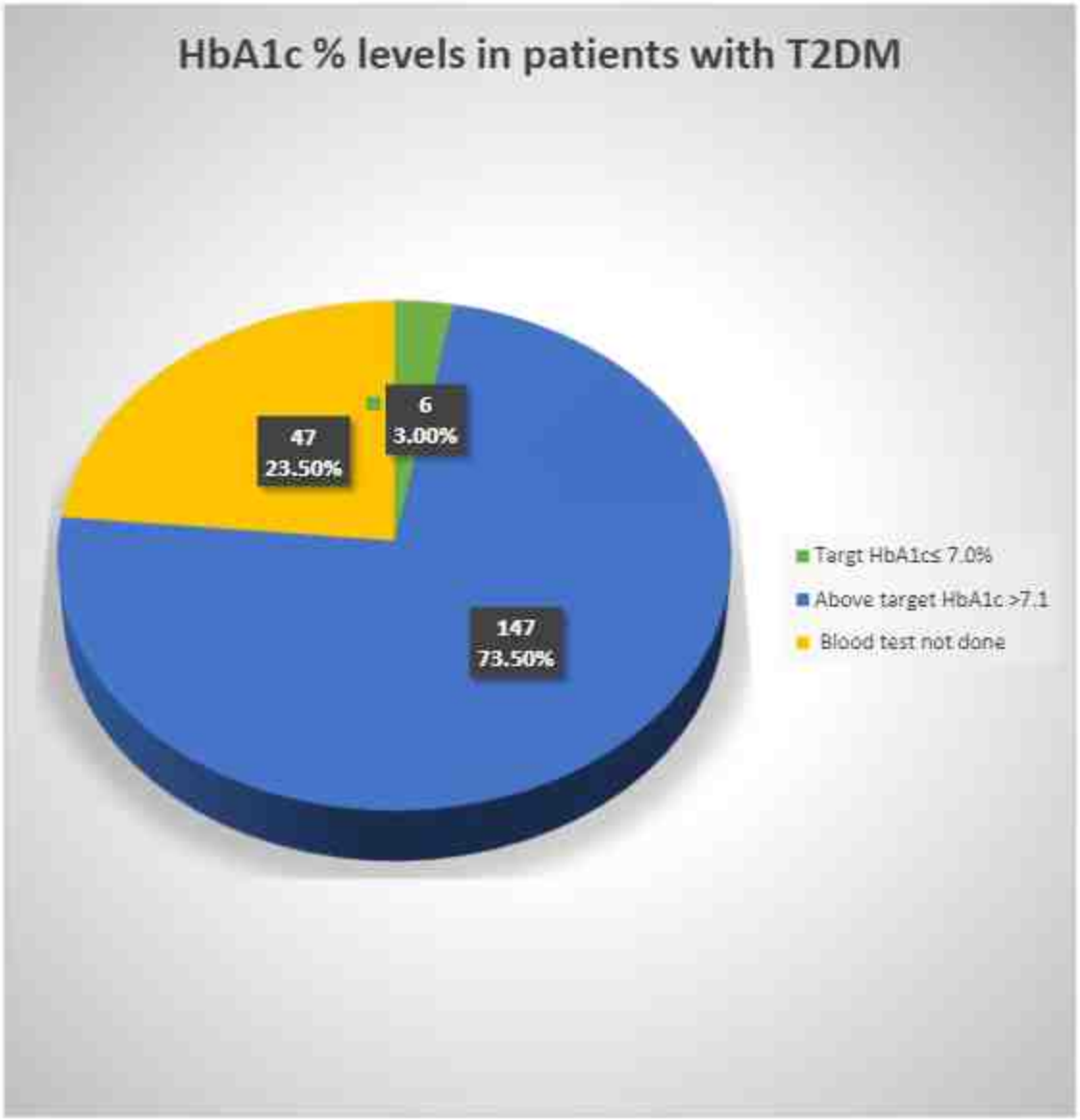

Table 3. 24: the correlation between education, gender, expensive medications, seeking health care and economic status among patients with Type 2 Diabetes Mellitus in the study group.

		Education				P value
		Illiterate N%	Primary N%	Secondary N%	University N%	
Gender	Male	8	32	32	21	< 0.001
		8.6%	34.4%	34.4%	22.6%	
	Female	55	26	15	11	
		51.4%	24.3%	14.0%	10.3%	
Total		63	58	47	32	
		31.5%	29.0%	23.5%	16.0%	
Expensive medications	Yes	46	40	24	11	0.001
		38.0%	33.1%	19.8%	9.1%	
	No	17	18	23	21	
		21.5%	22.8%	29.1%	26.6%	
Total		63	58	47	32	
		31.5%	29.0%	23.5%	16.0%	
Seeking for health cares	Yes	61	55	37	29	0.057
		33.5%	30.2%	20.3%	15.9%	
	No	0	0	2	0	
		0.0%	0.0%	100.0%	0.0%	
Total		61	55	39	29	
		33.2%	29.9%	21.2%	15.8%	
Do your economic status afford you to by special foods low in fat & carbs	Yes	13	21	25	26	< 0.001
		15.3%	24.7%	29.4%	30.6%	
	No	12	7	3	2	
		50.0%	29.2%	12.5%	8.3%	
	Sometimes	38	30	18	4	
		42.2%	33.3%	20.0%	4.4%	
Total		63	58	46	32	
		31.7%	29.1%	23.1%	16.1%	

This table demonstrates that illiteracy is higher in women than men and the percent of advanced education is doubled in men than women when p-value is statistically significant. The effect of the educational degree is clear on the ability of PW-T2DM to afford expensive medication and special

diabetic foods than PW-T2DM who are illiterate or less educated, for e.g. 35.5% of illiterate both men and women are unable to afford expensive medications, same for their ability to buy special foods low in fat and carbs when P-Value is statistically significant.

Table 3.25: Knowledge and attitudes towards Anti- hyperglycemic medications among patients with type 2 Diabetes mellitus in the study group.

Knowledge and attitudes towards anti hyperglycemic medications		Frequency	Percent
Side effects	Yes	62	31.0
	No	138	69.0
Expensive medications	Yes	121	60.5
	No	79	39.5
Diabetes Mellitus is treatable and not serious	Yes	18	9.0
	No	133	66.5
	Sometimes	49	24.5
Diabetes Mellitus can be treated with herbs without anti-hyperglycemic medications	Yes	29	14.5
	No	110	55.0
	Sometimes	61	30.5
Family discouragement for anti-hyperglycemic medications intake	Yes	44	22.0
	No	156	78.0
Addiction fear to anti-hyperglycemic medications	Yes	68	34.0
	No	132	66.0
Anti-hyperglycemic medications interfere with fasting	Yes	39	19.5
	No	161	80.5
Knowledge in changing anti-hyperglycemic medications dosage with diet and personal activity	Yes	29	14.5
	No	171	85.5
Total		200	100.0

31.0% of people with T2DM mentioned troublesome of medication's adverse effects and 34.0% have fear of being addicted to medications as well

as 19.5% of them consider anti-hyperglycemic medications interfere with their fasting.

Table 3.26: Ophthalmological visit after T2DM diagnosis of the patients in the study group.

Question	Status	Frequency	Percent
Did you examine your eyes by ophthalmologist after you have been diagnosed with Diabetes mellitus	Yes	154	77.0
	No	46	23.0
Total		200	100%

Table 3.27; frequency distribution of timing of eye examinations among patients with type 2 Diabetes mellitus in the study group.

Timing of eye exam	Frequency	Percent
Within 10 Years	50	25.0%
Within 5 years	106	53.0%
None	44	22.0%
Total	200	100

Table 3.28; Retinal screening result among patient with type 2 Diabetes Mellitus in the study group.

Result of retinal screening	Frequency	Percent
Normal	126	64.5%
Abnormal	26	13.0%
No screening	47	23.5%
Blindness	1	0.5%
Total	200	100

Table 3.29; Frequency distribution ofFasting lipid profile results among patient with type 2 Diabetes Mellitus in the study group.

Fasting lipid profile result	N	%
Normal	99	49.5
Abnormal	63	31.5
Not done	38	19.0
Total	200	100

19.0% of PW-T2DM didn't measure lipid profile, although the percent is small but significant since dyslipidemia and DM are Important risk factors for CVD.

Table 3.30; Frequency distribution of T2DM effect on daily life among patient in study group.

		Frequency	Percent
Does Diabetes Mellitus effect on your daily life	Yes	160	80.0
	Sometimes	33	16.5
	No	7	3.5
Total		200	100.0

The long term disease has its impacts on individual's life, apparent impacts were associated with social life, psychological disturbance and work. 80.0% of PW-T2DM IN HKC stated the disease has influences on their lives.

Table 3.31; frequency distribution of psychological effects of Type 2 Diabetes Mellitus among patients in study group.

Psychological effect on T2DM patients	Sadness	Depression	Worries	Denial	Multiple effects	Total
Frequency	20	12	56	17	95	200
Percent	10	6	28	8.5	47.5	100

The psychological sequel could be depression, sadness, worries, denial or it could be multiple effects involve more than one conditions (e.g. worries and sadness). The assessment of depression was based on the number of symptoms, duration of symptoms, functional and or social disturbance or disability and the suicidal ideation or trial. When PW-T2DM feels low mode but not meet the criteria for depression, the researcher considered it as sadness which mainly not lead to social/work disturbance or negative

impacts. The highest percent was for patients who suffer multiple effects of psychological impacts. Some patients have also highlighted the severe social disadvantages of living with T2DM. They feel their disease has caused them social isolation, less opportunity to participate in their hobbies, increase rates of depression, and anxiety on the progression of their disease. One patient confessed to suicidal ideation due to the increase economic burden of having the disease and being the main breadwinner.

Table 3.32; Different work consequences of patients with type 2 Diabetes Mellitus because of the disease.

Patients with type Diabetes Mellitus	Earlier retirement	Forced to leave work	Decrease in work's hours	Disturbance in work	No effect on work	Total
Frequency	9	10	6	62	113	200
Percent	4.5	5	3	31	56.5	100

The work effects of T2DM was studied in this research too, 31.0% of PW-T2DM has suffered work disturbances due to the symptoms of the disease or its complications. Other work effects were early retirements, decreasing working hours, and some has forced to leave the work. It is a known fact that chronic disease does not only affect a patient biologically, it also affects every other facet of a patient's life. It can severely lower a patient's quality of life, can cause disability, and can cause both felt and enacted stigma. Many patients who were interviewed felt that their psychosocial needs were unmet due to the disease, and that they have been experiencing a lower quality of life since being diagnosed.

Patients feel that the disease has had a major negative impact on work. Many have said that the side effects of the disease have caused them to be unable to complete the tasks as effectively as they did before developing the disease. Some patients have reported a lack of employment opportunities, and employers unwilling to cater to their disability. Some patients have confessed to being forced to undergo early retirement. This can have spiraling consequences that can cause an increase drain on personal resources, as well as severe inequalities in health.

Some patients have also highlighted the severe social disadvantages of living with T2DM. They feel as if their disease has caused them social isolation, less opportunity to participate in their hobbies, increase rates of depression, and anxiety on the progression of their disease. One patient confessed to suicidal ideation due to the increase economic burden of having the disease and being the main breadwinner.

% of people with T2DM in study group	Kind of information that has been responded correctly in DM questionnaire					
80-99% (EXCELLENT)	Recognition diabetes as non-communicable disease	Blurred Vision as a symptom of T2DM	Dry mouth as a symptom of T2DM	Frequent thirsty as a symptom of T2DM	Glucometer use to recognize low blood glucose	Glucometer use to recognize high blood glucose
60%-79% (ADEQUATE)	Identification Diabetes as a condition of high blood glucose	Feeling tired, irritable as symptoms of T2DM	Blindness as a complication Of T2DM	Pain or tingling as symptoms of T2DM	Renal failure as a complication Of T2DM	Hypoglycemia as adverse effect of ADM
	Regular meals as a healthy life style	T2DM associated with complications	T2DM is not serious and treatable	Glucometer use to provide immediate feedback of food effect	Glucometer use to provide immediate feedback of AHM effect	
30%-59% (INADEQUATE)	Diabetes is a chronic disease, needs life-long treatment	Diabetes is progressive disease overtime	The need of Lifestyle therapy in T2DM	insulin as option in treatment of T2DM	Weight change in T2DM	May have all mentioned symptoms in T2DM
	Heart disease as a T2DM complication	Believe no complications in T2DM	Hereditary as a risk factor	Un healthy life style as a risk factor	Stoke as a complication of T2DM	Gastric upset as adverse effect of ADM
	Change in body weight as adverse effect of ADM	Differentiate high carbs or fat content in foods	Regular exercise as a healthy life style	Loss of limb as a complication	Neuropathy as a complication	Timing of the eye exam
	Can be treated by Herbs.	Tremor & fear as symptom of hypoglycemia	Sweating & palpitation as symptom of hypoglycemia	Fainting as a symptom of hypoglycemia		
0%-29% (DEFICIENCY)	Diabetes due to lack of insulin	Short course of medication may cure Diabetes	T2DM due to Insulin resistance	Role & amount of vegetable & fruits	Obesity as a risk factor	HTN as a risk factor
	Foot-self examination	Identification black line as gangrene	The need for immediate Ophthalmological consultation	Seizure as a hypoglycemic symptoms	The need for special Diabetic shoes & socks	Vegetables and fruits as important healthy nutrient in T2DM

Figure 3.7; The percent of patients in the study group who responded correctly to multiple choices questions.

Table 3.33; knowledge score of patients with Type 2 Diabetes Mellitus in Holly Karbala city.

	N	Range	Mean	SD	95% Confidence interval of the mean
Knowledge score	200	0 - 48	23.38	10.56	21.91 – 24.97
Knowledge score %	200	0 - 90.57	44.1	19.92	41.34 – 47.11

The **Knowledge score** was **44.1% ± 19.92 SD with 95 % Confidence Interval 41.34 % - 47.11 %** which point out that it is **In-adequate score** according to KAP score categories of this study.

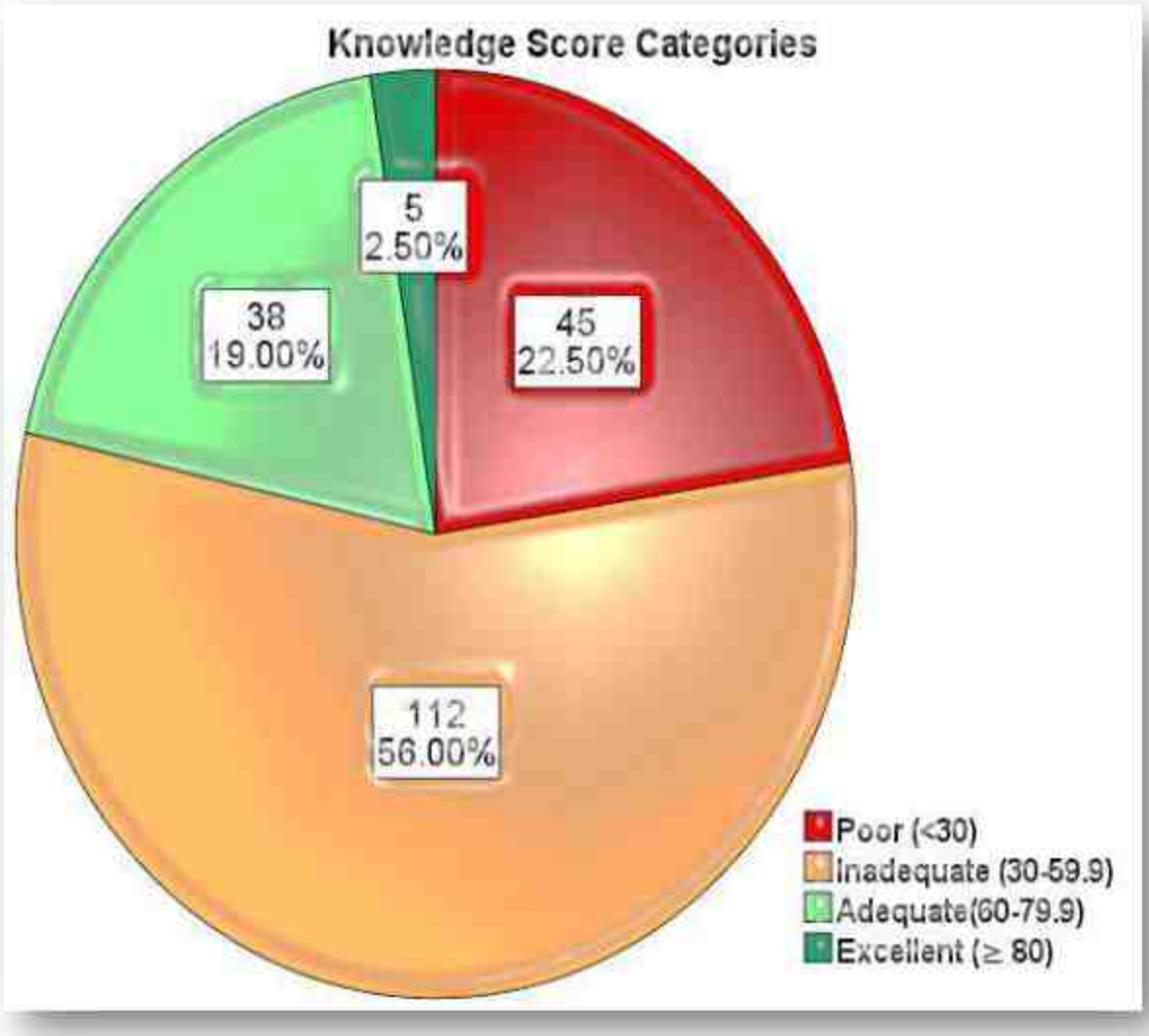

Figure 3.8; Knowledge score Categories in percent of patients with Type 2 Diabetes Mellitus in Holly Karbala city.

The highest categories is for In-adequate knowledge 56.00%, the least is for Excellent knowledge category 19.00%, this highest percent is related to high educated with good income patients as its shown from the table of association of Knowledge status with demographic factors.

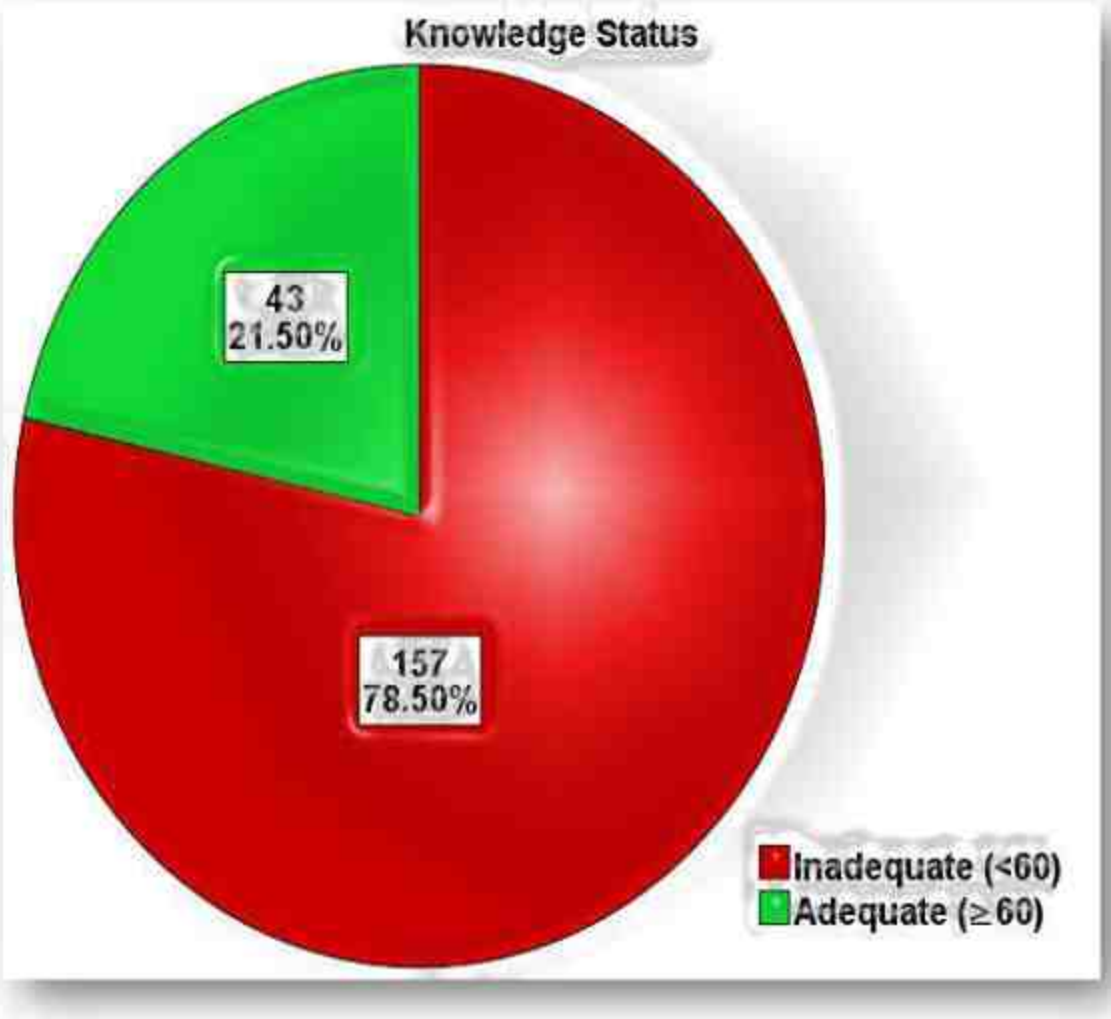

Figure 3.9; knowledge status of patients with Type 2 Diabetes Mellitus in Holly Karbala city considering 60% as cut off point of passage.

78.50% PW-T2DM have **In-adequate** knowledge in identified basic diabetes facts. This high percent brings the attention for a massive effort to upgrade the learning tools about this disease.

Table 3.34: The association between knowledge status and some socio-demographic characteristics.

Variable		Knowledge status		Total N (%)	P value
		Inadequate N (%)	Adequate N (%)		
Gender	Male	66 (71.0%)	27 (29.0%)	93 (100.0%)	**0.016**
	Female	91 (85.0%)	16 (15.0%)	107 (100.0%)	
Age Group	<=45	29 (87.9%)	4 (12.1%)	33 (100.0%)	0.944
	46-60	82 (73.2%)	30 (26.8%)	112 (100.0%)	
	>60	46 (83.6%)	9 (16.4%)	55 (100.0%)	
Marital Status	Married	132 (77.6%)	38 (22.4%)	170 (100.0%)	0.595
	Widow	22 (81.5%)	5 (18.5%)	27 (100.0%)	
	Divorced	3 (100.0%)	0 (0.0%)	3 (100.0%)	
Education	Illiterate	57 (90.5%)	6 (9.5%)	63 (100.0%)	**< 0.001**
	Primary	49 (84.5%)	9 (15.5%)	58 (100.0%)	
	Secondary	38 (80.9%)	9 (19.1%)	47 (100.0%)	
	University	13 (40.6%)	19 (59.4%)	32 (100.0%)	
Work	wage earner	56 (81.2%)	13 (18.8%)	69 (100.0%)	**0.027**
	Housewife	76 (85.4%)	13 (14.6%)	89 (100.0%)	
	Employee	14 (56.0%)	11 (44.0%)	25 (100.0%)	
	Retired	5 (62.5%)	3 (37.5%)	8 (100.0%)	
	Handicapped	2 (66.7%)	1 (33.3%)	3 (100.0%)	
	Jobless	2 (100.0%)	0 (0.0%)	2 (100.0%)	
	Free work	2 (50.0%)	2 (50.0%)	4 (100.0%)	
Economic Status	Weak, poor	72 (85.7%)	12 (14.3%)	84 (100.0%)	**0.035**
	Intermediate	85 (73.3%)	31 (26.7%)	116 (100.0%)	
Crowding index 2	<1 (Good)	8 (61.5%)	5 (38.5%)	13 (100.0%)	**< 0.001**
	1-2.99 (Intermediate)	68 (69.4%)	30 (30.6%)	98 (100.0%)	
	≥3 (Poor)	81 (91.0%)	8 (9.0%)	89 (100.0%)	
Smoking	Yes	35 (66.0%)	18 (34.0%)	53 (100.0%)	**0.010**
	No	122 (83.0%)	25 (17.0%)	147 (100.0%)	
Total		157 (78.5%)	43 (21.5%)	200 (100.0%)	

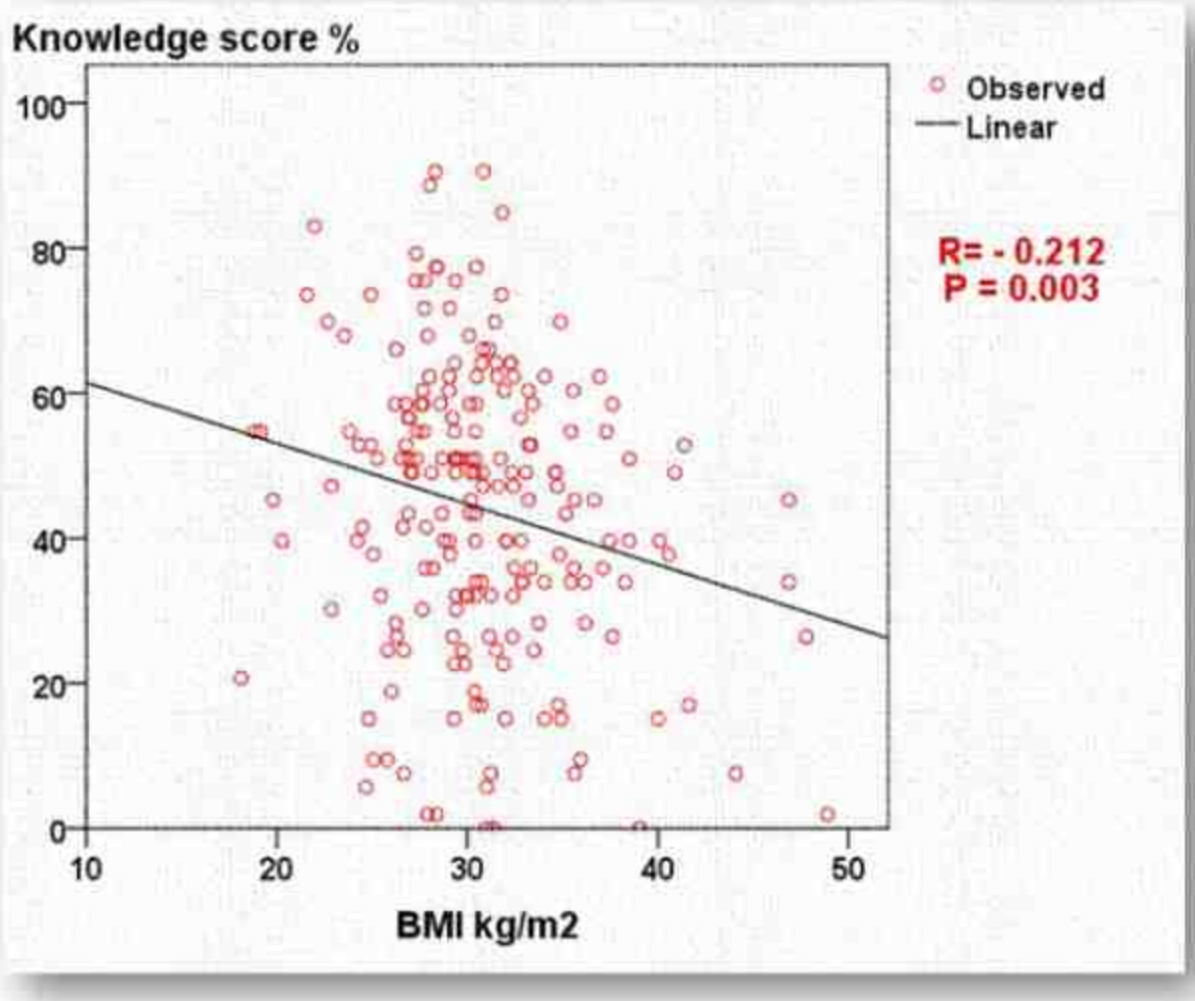

Figure 3.10. Correlation between Knowledge score% and BMI of patients with type 2 Diabetes mellitus in the study group.

There is negative correlation between Knowledge score% and BMI of patients with type 2 Diabetes mellitus in the study group. (correlation coefficient is negative) when P-Value is statistically significant, which means improving knowledge leads to decrease of BMI. If PW-T2DM know well about healthy life style modification (control weight, healthy diet, exercise), it will reflect positively in decreasing BMI. BMI mean score indicated overweight and obesity were common among patients. As shown from the study results

that there was deficiency or In-adequate of their information about the disease, consequently, ended up with this unhealthy figures of BMI.

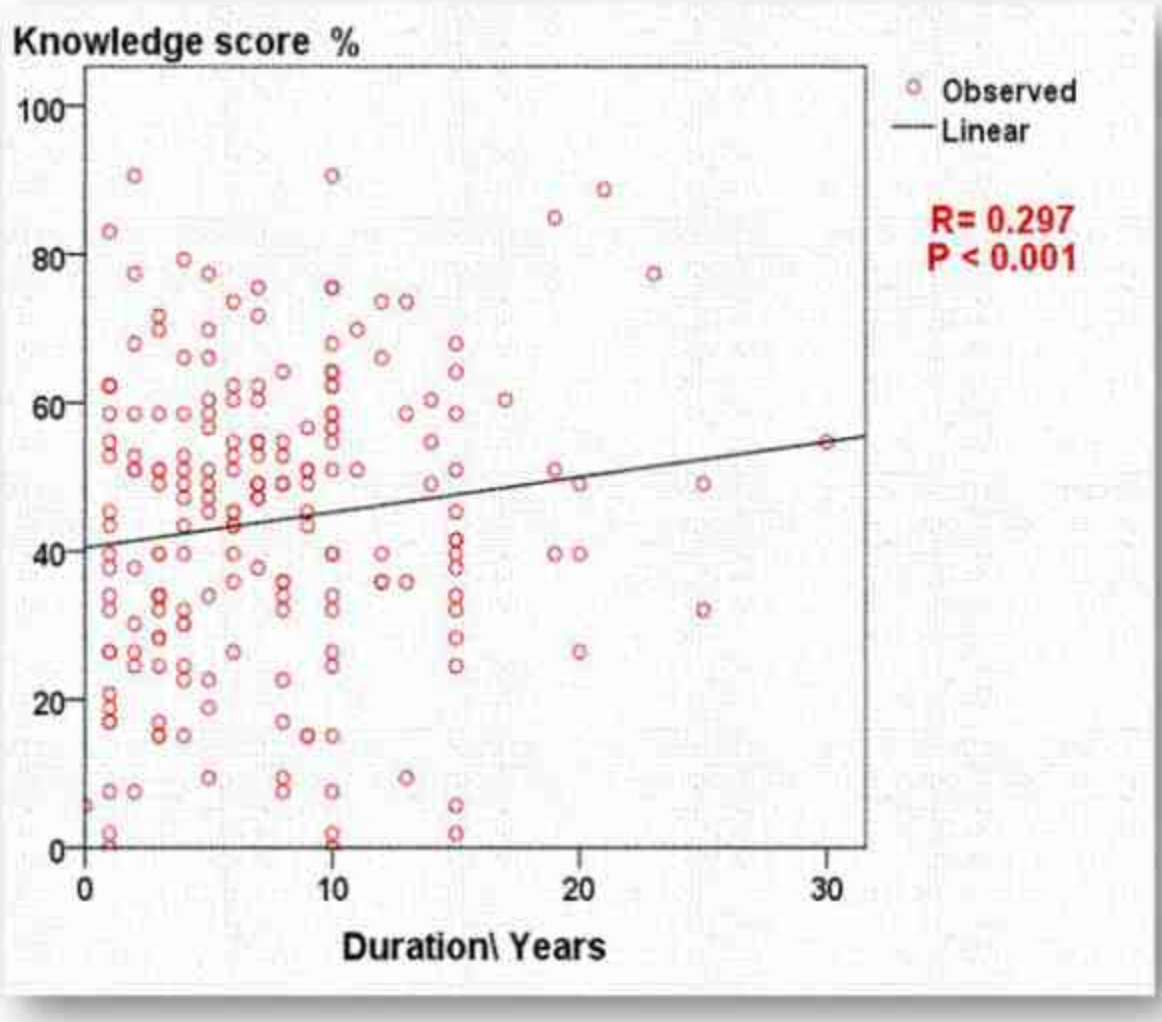

Figure 3.11; Correlation between Knowledge score% and duration of disease of patients with Diabetes Mellitus in the study group.

there is a positive correlation between knowledge and disease duration (correlation coefficient is positive) when P-Value is statistically significant. This means the longer is the duration of the disease, more knowledge patients will get from their own experience with the disease, in other words Patients with long-standing disease were noticed more knowledgeable than

patients with newly diagnosed T2DM. During the long time of the disease patients may also increase their knowledge acquaintances from different educational resources mostly from family and surrounding friends as mentioned in previous table of educational resources. Serious complications of T2DM can be prevented when basic scientific facts of disease and healthy life style modification concepts must be given to PW-T2DM as early as possible in the course of the disease by an educational program.

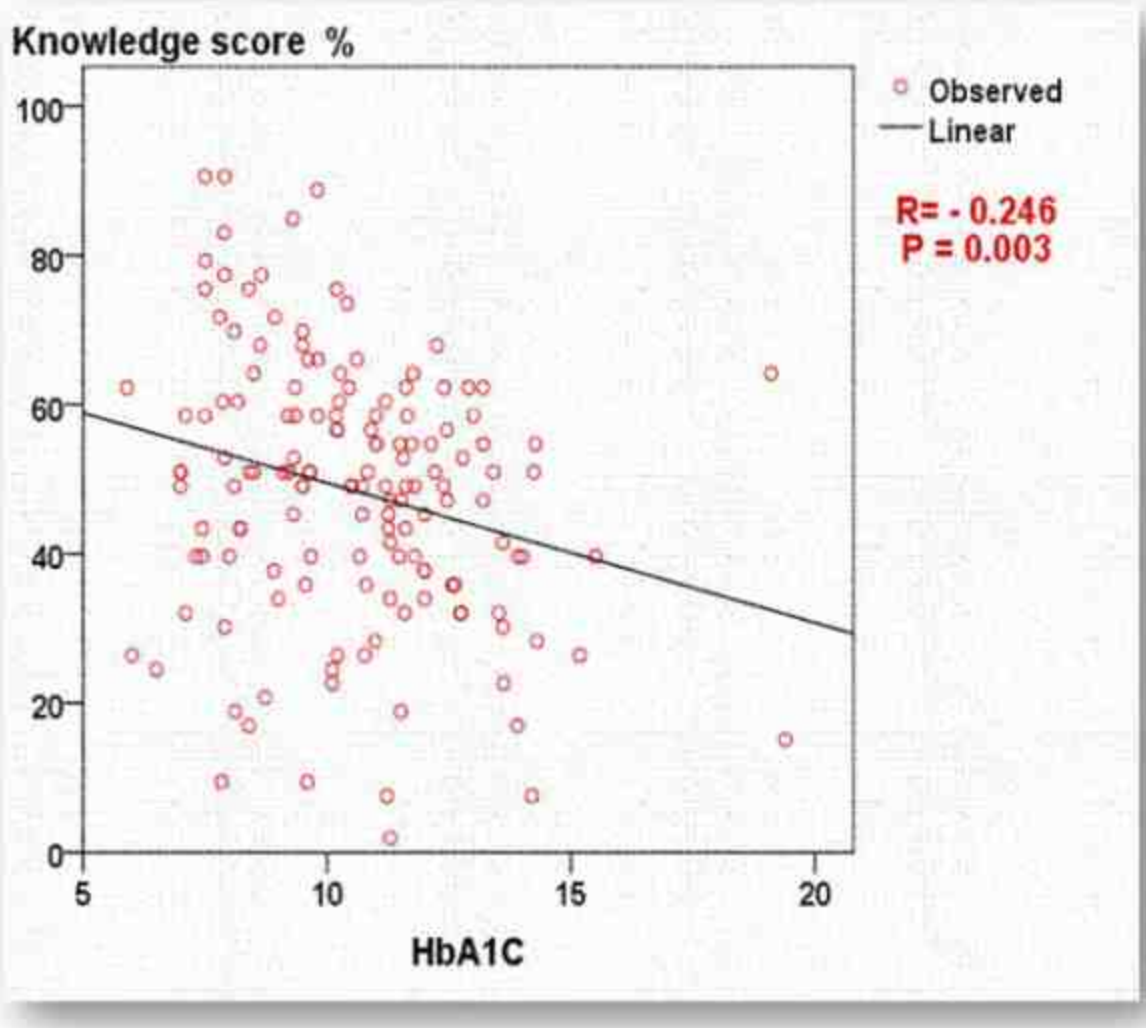

Figure 3.12; Correlation between Knowledge score% and HbA1C of patients with Type 2 Diabetes Mellitus in the study group.

There is a negative correlation between knowledge and HbA1C (correlation coefficient is negative) when P-value is statistically significant. All scientific resources including Nice guidelines ,2019 which was updated at 2023, emphasized the fact that provision T2DM knowledge through counselling is the first step in its management, HbA1c is the main target of this management. The result of this figure emphasize this fact when it has shown increasing diabetic knowledge means improving HbA1c level.

Table 3.35: Regular positive practices of patients with T2DM in the study group.

Regular Positive Practices	Sum	Mean	SD	Mean percentage
Exercise	45	0.235	± 0.425	23.5%
healthy meals	87	0.435	±0.497	43.5%
3-5 serving of vegetable per day	37	0.185	± 0.389	18.5%
3-5 serving of fruit per day	32	0.16	± 0.367	16%
Multigrain bread intake	46	0.23	± 0.421	23.0%
Avoiding fat food or fast processed food	74	0.37	± 0.484	37%
Avoid carbohydrate food	117	0.585	± 0.493	58.5%
Calorie input Counting	3	0.015	± 0.121	1.5%
Weight control	47	0.235	±0.425	23.5%
Self-management education	27	0.135	±0.342	13.5%
Attending educational Course	0	0	0	0.0
glucometer use	117	0.59	±0.493	59.0%
glucometer follow up	78	0.391	±0.489	39.1%
Blood pressure machine owners	53	0.265	±0.442	26.5%
Immediate doctor consultation	123	0.615	±0.487	48.7%

Continue table 3.35				
Eye exam by ophthalmologist	153	0.235	±0.425	23.5%
Smoking cessation	24	0.12	± 0.325	12.0%
*Dealing with Hyperglycemia with 3 steps	165	0.825	± 0.380	82.5%
*Dealing with hypoglycemia with 2 steps	191	0.955	± 0.207	95.5%
Regular intake of anti-hyperglycemic medications	114	0.57	± 0.496	57.0%
Completed laboratory work;				
1-HbA1c	147	0.735	±0.442	73.5%
2-FBG	99	0.495	±0.501	49.5%
2-RBG	167	0.835	±0.372	83.5%

*Positive practices in both hypo and hyperglycemia are considered when PW-T2DM were involving 3 steps of non-pharmacological management together as illustrated in figure 3.4. Regular positive practices referred to answer yes in the questionnaire while answer to sometimes fields considered irregular practices.

Total average for all regular positive practices is **0.399 ± SD 0.2536 (39.9% ± SD 25.3%,95% confidence interval of mean 0.4544 - 0.3990, range 0.94)** , which is categorized as **In- adequate**.

The **first Rank** for regular positive practices was for dealing with hypoglycemia in three steps (Mean 0. 0.955 ± SD 0.207), the **second Rank** was for dealing with hyperglycemia in three steps (mean 0.825± SD 0.380)

and the **third rank** was for completeness of HBA1c Laboratory work (mean 0.735 ± SD0.442).

Table 3.36: Regular positive attitudes of patients with T2DM in Karbala city in the study group.

Regular positive Attitudes with T2DM	N	Mean	± SD	Mean%
No effect on work	**113**	**0.567**	**±0.496**	**56,7%**
No effect on daily life	**7**	**0.035**	**±0.184**	**3.5%**
Hereditary as etiology	**6**	**0.03**	**±0.171**	**3.0%**
Not considering alternative Treatment	**76**	**0.38**	**±0.486**	**38.0%**
No side effect of Anti-diabetic medications	**138**	**0.69**	**±0.463**	**69.0%**
Anti- diabetic medications are unexpansive	**79**	**0.395**	**±0.490**	**39.5%**
Anti-diabetic medications are un addictive	**132**	**0.66**	**±0.474**	**66.0%**
Change anti-diabetic medication' doses in Change anti-diabetic	**29**	**0.145**	**±0.352**	14.5%

Continue table 3. 36				
T2DM un treatable with herbs only	**110**	**0.55**	**±0.498**	**55.0%**
T2DM is chronic & not serious disease	**133**	**0.665**	**±0.473**	**66.5%**
Internal specialist consultation	**178**	**0.89**	**±0.313**	**89.0%**
Thoughts of smoking cessation	**33**	**0.165**	**±0.372**	**16.5%**
Change medication doses in relation to diet & personal activities	**29**	**0.145**	**±0.352**	**14.5%**
Receiving family encouragement in regards to medications intake	**156**	**0.78**	**±0.415**	**78.0%**

Total average for regular positive attitudes was **0.482 ± SD 0.2929 (48.2% ± SD 29.2%,95% confidence interval of mean 0.5232 - 0.4420, range 0.94)**, **which** is categorized as **in-adequate** too.

The **First Rank was** for regular positive attitudes is Internal specialist consultation (mean 0.89 ± SD 0.313), the **second Rank** was for Anti-diabetic medication' doses not interfere with fasting (0.805 ± SD 0.397) and the **third Rank** was for No side effect of Anti-diabetic medications (0.69 ± SD 0.463).

66.5% of PW-T2DM consider the disease as chronic and not serious disease. Their good attitudes to the medications as its not interfering with their fasting which is the most common religious practice related to medication's intake, no side effects of medications and 66.0% considering the anti-diabetic medications as un addictive are all encouraging. Their regular intake of medications was 57.0% (as shown in table of regular positive practices) was In-adequate in spite of positive attitudes, this could be explained by their wrong attitudes towards the disease as 66.5% of them think the disease is treatable and they think one course of single or multiple medications should resolve the disease same as in case of chest or gastro intestinal infections as the same percent of them recognized it as not serious disease. Consequently, their disappointment with unrecovered symptoms with anti-diabetic medication my result in irregularity of its usage, neglect the medication or change its type. As results, many serious consequences for these wrong attitudes will appear one of the most important is inability to prevent morbidity and mortality of diabetic disease, secondly, the huge governmental and private financial loss due to discarded un liked medications by patients frequently. Lastly, the frequent visits to public health centers or private clinics which are time consuming for both patients and physicians. This financial and time loss should be invested in establishment of education centers in both diabetic centers and health centers and the educations efforts in these centers should be watched effectively and seriously.

Table 3.37; Correlation of knowledge score, regular positive attitudes score and regular positive practices with HbA1c.

Variable	Knowledge score (Mean)	Regular Positive Attitudes Score (Mean)	Regular Positive Practices Score(Mean)
HbA1c Mean	R= - 0.246 (negative) P=0.003	R= 0.998 (positive) P=0.612	R= 0.990 (positive) P= 0.590

Table 3.38; Correlation of regular positive attitudes score and regular positive practices score with Knowledge score.

Variable	Regular Positive Attitudes Score (Mean)	Regular Positive Practices Score(Mean)
Knowledge score (Mean)	R= 0.993 (positive) P=0.846	R= 0.990 (positive) P= 0.818

Table 3.39; Correlation of regular positive attitudes score with regular positive practices score.

Variable	Regular Positive Attitudes Score (Mean)
Regular Positive Practices Score (Mean)	R= 0.999 (positive) P=0.977

R= Pearson coefficient correlation, P= P-Value.

The Pearson Correlation measures the strength of the linear relationship between two variables, it has a value between -1 to 1, with value of -1 meaning a total negative linear correlation being no correlation and +1 meaning a total positive correlation(Williams B. and Cremaschi S., 2020) (Faizi N. and Alvi Y. in .,2023) Since the Pearson Correlation scores between Knowledge score and positive practices, between Knowledge score and positive attitude score, between positive practice and positive attitudes score are 0.9 which all are close to 1. This explained their positive correlation as seen in table 3.37, in other words, if one variable increase the other one also increase like a parallel line, this could explain the assuming the influence of one Variable on the other but the P-value is above 0.05 which means it's not statistically significant. Also the fact of causality (the cause effect between two variables) can't be approved in this study since its cross sectional study and small sample size.

While it was initially the researcher considered Knowledge of T2DM as Independent Variable and its attitudes and practices particularly positive regular ones as dependent variables, the result of this table may not assure this association due to P-Value. The Bias and confounding factors could play role in the results as shown in previous table (the association between knowledge status and socio demographic factors). The result has shown that there is significant effect of gender when male more educated than female, education's factor when even university graduated showed In-adequate knowledge plus economic effects when the education was less in poor people. Therefore, the regular positive attitudes and practices in this study could be explained due to the experiences patients got from long duration of the disease in additions to acquaintances of their education from family surrounding and friends who may or may not have same disease

CHAPTER FOUR

DISCUSSIONS

DISCUSSION

4.1- Social support and economic status.

In HKC the social bonds are excellent since 85.0% of participants are married and most of them have a large family, what matters is that although a large family is supportive but in hardness of financial limitation it would be a heavy burden on adult patient with diabetes who is responsible for living expenses plus expenses of his treatment while he is suffering all the pain of Diabetes.

The social support is of a great significance in determining the ways of non-pharmacological treatments will be, social support effect will have different aspects for instance 58.5% of people with T2DM in HKC are dependent financially on other family member's income and whose main financial providers will determine the type of health care these patients will receive whether would be by nearby health center, or far away hospital, costly specialist consultations or less costly primary care consultation. Sometimes because of the financial difficulties the diabetic patients forced to treat their diabetes by illegal nurse clinics. Financial family supporters will also control the ability of decisions making in the manner of how diabetic patients will receive their both non-pharmacological and pharmacological treatments. The research displays that 50.5% of them are, unable to make their decisions regarding the ways and cost of their treatments, this 50.5% are considerable percent and needs more authority's attention. This figure is approximately similar to the one related to who is the decision-maker in correlation with different management-choices of diabetic patients in this research.

The percent of individuals with T2DM who are financially independents is 41.5% and who are able to direct the decisions is 49.5%, these percent of participants in this research although they are financially independent but most of them are poor, since this research demonstrates that 42.0% of total participants are poor, in addition, 18.2% of them have another family

member having Diabetes Mellitus who is living with them. The above mentioned figures illustrates that people with T2DM are suffering heavy financial load which necessitate special governmental diabetic allowance on Monthly basis to cover costly diabetic treatments. Also the above mentioned figures exhibit the importance of family role in controlling diabetic patient's disease, this known fact should be addressed partially by continues provision of family counselling together with the patient's counselling to direct any obstacles that can be found in the ways of proper managements.

The correlation between the knowledge of Diabetes Mellitus and the crowding index 2 shows the higher percent of Knowledge inadequacy is between poor people 91.0% (p value=0.001). When looking at the correlation between inadequacy of knowledge and economic status, will notice that poor and intermediate economic status also have a high level of inadequacy in knowledge (85.7%, 73.3% respectively, p value= 0.035).

The correlation between inadequate knowledge and gender revealed that women had a higher percent of inadequacy than men (85.0%, 71.0% respectively, p value=0.016)

Non pharmacological management involving diet, exercise, smoking cessation, follow up glucometer readings, follow up medical appointments need family involvement and encouragement. 33.0% of participants mentioned they didn't receive family support through their illness.

The percent of PW-T2DM who are using multiple medication therapy is 51.5%, the percent of PW-T2DM who are using insulin whether alone or in combination with other medications is 14.0%. 32.0% of them are using single anti-hyperglycemic medications mostly metformin which is recommended in many literatures as a first therapeutic choice, Metformin is available in almost all health facilities in HKC in a very convenient price, financial problems face people with T2DM who found their blood glucose uncontrolled with Metformin and sometimes need to buy additional antidiabetic medications which are very costly to help them achieve glycemic

control. Insulin is available only and occasionally in diabetic center. Only 3.0% of Patients with T2DM used life style modification as therapy and by those who are newly diagnosed or who successfully achieved glycemic target by this way. In this study 75.5% of PW-T2DM suffered hyperglycemia weather once or several times, hence, most people who are on mono or multiple therapy depend mainly on medications to fight hyperglycemia, they may or may not accompany partial life style modification with the medications previously, and this is because either they are unfamiliar with what means by life style modification or they disappointed with it thinking wrongly diabetes should be cured by it , 9% think diabetes can be cured, 24.5% think sometimes can be cured by life style modification. Additionally, lifestyle modification needs time, efforts and money, probably PW-T2DM need a way to treat their disease forever and that should be fast and cheap. Most diabetic patients think that when they administer an anti-hyperglycemic medication, it should be like magic in curing the disease, therefore, failure rate is high with monotherapy because of disappointment with medication not understanding the chronic nature of the disease, then with time they started to understand the chronic nature of Diabetes mellitus and that it has no permanent resolution of it after they have tried multiple medications but this unfortunately when their diseases have advanced to complicated stages. As a result, the need for self-education management and Diabetic medical counselling are of great importance.

Internists have the largest share in the percentage of diabetic medical consultations by most of the PW- T2DM, 89.0% of them considered their diseases management should be directed by specialists since they hold highest scientific degrees, whereas only 4% attended primary health care for consultation, 7.0% are using mixed consultations. This figure explains the fact that although 42.0% of people are poor who's their financial difficulties are unable them to cover the costly specialist visits, nevertheless, the cheaper primary care consultations are lower than the one for specialists. Usually patients consult doctors who they trust and believe in their ways to manage

their diseases, although this trust may cost them money, people with T2DM IN HKC don't have enough trust in primary care physicians either because the GPs didn't display enough competency in this field of medicine or because the limited facilities GPs have within their health care centers to offer a competent medical services for diabetic patients to reach their satisfactions, for instances, unavailability of required laboratory works, shortage or un availability of required anti-hyperglycemic medications at the health center-pharmacies, lack of trained diabetic nurses and allied health team in health centers. All these factors assist in decreasing the quality of care that could offer to diabetic patients in primary health care settings to reach their satisfaction. Similar study done in South Africa also concluded the need to ensure that healthcare providers are continuously trained and provided with the essentials in order to comprehensively care for diabetic patients, furthermore, continuous evaluations should be performed on regular basis (Celesta-Harris s. and Maryniuk M.,2006).

4.2-EVALUATION OF THE KNOWLEDGE

The interview process and the result of this study has highlighted an obvious gap of knowledge between men and women. There are many reasons for this discrepancy: firstly, men are given more opportunities for education; secondly, men may have greater layman knowledge as they have more social chances to gather and speak about their disease; thirdly, women from a lower socioeconomic status are more likely to be socially isolated and must rely on their husbands/fathers/sons to gather information for them. Basically, most participant recognize T2DM as a condition of high blood glucose while their knowledge about the scientific etiology and course of the disease was inadequate.

Another question was regarding if the diabetes can be resolved by short course of medication, this question reflects their idea about the prognosis of the disease, 39.0% agreed its resolved with short course of medications

probably those who are newly diagnosed with T2DM, while 38.5% of them didn't know what would be the health outcome if a short term pharmacological therapy had been used in T2DM. Only 22.5% got the correct answer and they thought its chronic disease not resolved by short course of anti-hyperglycemic medications. Accordingly, PW-T2DM have deficiency in knowledge related to the prognosis of the disease.

T2DM may progress with time in severity that may presents with uncontrolled hyperglycemia when multiple anti-hyperglycemic choices as well as insulin may be the treatment's options, a question was asked to test PW- T2DM IN HKC about their acceptance if insulin may be one of their treatment options in present or in future, 37.5% agreed insulin might be needed, 58.5% don't know about insulin treatment, 4.0% disagree with insulin requirement. As a result, PW-T2DM have inadequate knowledge regarding insulin therapy as a choice.

Regarding life style modification as a choice of treatment, 36.5% support the life style modification as a treatment' choice in T2DM, 40.5% don't know and 23.0% disagree with this method of treatment. PW-T2DM have inadequate information regarding life style modification as a mode of diabetic therapy.

As result of t assessment PW-T2DM IN HKC have inadequate knowledge related to course of the disease, life style modification and insulin as treatment options, and deficiency in knowledge regarding T2DM prognosis while have adequate knowledge in identification T2DM as high blood glucose.

4.2.1-SYMPTOMS OF DIABETES

Most PW-T2DM IN HKC responded correctly to the multiple choice-questions related to the most common symptoms in T2DM, According to the mentioned figures most PW-T2DM IN HKC are familiar with the most

common symptoms of diabetes, their knowledge is due to their life experiences with the disease.

As a result of this estimation, PW-T2DM IN HKC have excellent knowledge in diabetic symptoms related to blurred vision and thirsty. Adequate knowledge in feeling tired, irritable and pain or tingling in lower leg. Deficient knowledge related to weight changes in diabetes and in possibly having all mentioned symptoms at the same time.

If a regular counselling or structured diabetic program have been attended, then they would have been able to recognize even the less common symptoms or symptoms they didn't experience during their disease.

4.2.2-COMPLICATIONS OF T2DM

As a result of this study, PW-T2DM IN HKC have adequate knowledge in recognizing blindness and renal failure as complications of T2DM and in believing T2DM is associated with complications.

Inadequate knowledge in recognizing neuropathy, heart disease, stroke, loss of limb as complications of T2DM.

understanding the prognosis and the nature of complications in diabetes help them to adhere to non-pharmacological and pharmacological therapy, seeking medical attention and in psychological acceptance for any kind of complication if it occurs.

4.2.3-T2DM RISK FACTORS

The diabetes risk factors which mentioned in Diabetes questionnaire are; family member with diabetes, leading unhealthy life style, Hypertension and obesity. All these demonstrates that there is severe deficiency of knowledge in this area.

As a result of this study and estimation, PW-T2DM IN HKC have inadequate knowledge of hereditary as a risk factor, deficient knowledge of unhealthy life style, HTN, obesity as risk factors for developing T2DM.

4.2.4-GLUCOMETER READING

Most people with diabetes benefit from monitoring BG for a variety of reasons Monitoring BG is the best way to confirm and appropriately treat hypoglycemia (Karter AJ. et al, 2001) (Karter AJ. et al, 2006). It can provide feedback on the results of healthy behavior interventions and the effect of anti-hyperglycemic medications. It can increase adherence to treatment, it can also provide information to both to the diabetic patient and their diabetes health-care provider to facilitate longer-treatment modification and titration of medications as well as shorter-term treatment decisions such as insulin dosing in T2DM, (Diabetes Canada Website, 2020). these points were addressed in the knowledge assessment of the benefits of frequent glucometer readings in PW-T2DM in the research questionnaire. PW-T2DM IN HKC were tested for the significance of using glucometer, their responses were excellent in understanding its use to recognize both high and low blood glucose, adequate response in knowing of its immediate feedback of blood glucose after using AHM or after food intake, the figures are demonstrated in (Table 3.11).

their knowledge was acquired from either direct care from supervised physicians weather specialist or primary doctor, or from general information gained from families and friends, sometimes from literature or media. Additionally, the information may be gained from personal experience of long term disease since there are diseased people who are illiterate, poor who can't follow up scientific instruction by all means and neither can attended health care facilities due to their low incomes, more importantly, there are no structured diabetic programs that can provide them with required information in their suffering with bitterness of disease chronicity.

4.2.5-HYPOGLYCEMIC SYMPTOMS

During the interview with the participants it was noticed that each individual had his own experience with hypoglycemia by having different

kinds of symptoms for example, some recognize having hypoglycemia by feeling headache, or dizziness, sometimes feeling hunger or irritable. In spite of this differences in symptoms, most PW-T2DM IN HKC are dealing with hypoglycemia by sweet ingestion and stopping AHM for a while, barely with the need for medical consultation, one of the reason for low percent of hypoglycemia in PW-T2DM IN HKC is the usual high carbs meals and sweet drinks in Iraq that abort hypoglycemia in its primary stages without getting to the seriousness of fainting and seizure. This may explain the low percent (39.0%) of PW-T2DM faced hypoglycemic attach previously (table 3.18) and low percent (1.5%) of their admission to hospitals because of hypoglycemia. The only one way to deal with hypoglycemia beside sweet ingestion in PW-T2DM IN HKC was stopping intake AHM rather than changing the doses of medications, in this study 190 of PW-T2DM stop their medication in initial hypoglycemic attach instead of knowing how to adjust the AHM according to diet or personal activities, which means participants may stop their AHM for a long time after feeling hypoglycemia instead of adjusting the doses, consequently, hyperglycemia will appear probably with high levels of blood glucose. Hypoglycemia should be an important subject to explain in each medical counselling and follow up appointment.

4.2.6-ADVERSE EFFECT OF AHM

Three multiple choices questions in this study questionnaire were about the side effect of anti-hyperglycemic medications and its most common adverse effects which are Hypoglycemia, gastric upset and weight gain, these should be known by most of people with T2DM by a brief explanation either by specialist, primary health care or pharmacist at the time when medications have prescribed, the reason for emphasizing on this point of adverse effectivities is that gastric upset and increase or decrease body weight may make patients either dislike the medications or they will think the medications are not working probably, as a result they will discontinue the medications or un adhere to them on regular basis. The

appropriate medical counselling in organized time interval will come out now as must.

As result of this study and estimations, PW-T2DM IN HKC have adequate information in knowing adverse effect of AHM related to hypoglycemia but inadequate information in relation to gastric upset, weight change as side effect of AHM

4.2.7-HEALTHY LIFE STYLE

Another question in the assessment was the ability of participants to distinguish between low or high carbohydrate food and unhealthy fatty food items or fast processed foods, the knowledge in this field is one important step in lifestyle modification of their non-pharmacological treatments. Education about different groups of foods, essential nutrients, some examples of diabetic recipes can be provided by dietitian, thus Dietitian availability in diabetic center should be one of the absolutely necessary to resolute patient's confusion in this matter. The approach to healthy life styles has many ways, beside regular healthy low carbs and fat foods, structured regular exercise is another demand.

According to WHO, unhealthy dietary habits and excessive energy intake are part of most important modifiable risk factors for non-communicable disease (World Health organization and World Economic Forum ,20019).

As a result of this study and estimations, PW-T2DM IN HKC have inadequate knowledge in healthy life style including the ability to recognize the percent and the kinds of fats and carbs in foods, and the importance of exercise in controlling blood glucose level, deficiency in knowing vegetables and fruit as healthy nutrient in T2DM, adequate information in the importance of regular meals (table 3.20).

4.2.8-EYE EXAM

As a result of this estimation, PW-T2DM IN HKC have inadequate information regarding the need and timing of eye exam. Education about eye health in T2DM is important.

4.2.9-FOOT CARE

This research includes people knowledge about foot care in terms of daily foot self-examination, searching for cuts, sores, ulcers, infections, understanding the initial stage of gangrene as the appearance of black line on the infection site, also awareness that most of time gangrene will end up with an amputation of the effected limb. PW-T2DM IN HKC show poor response to those questions.

As a result of this study and estimations, PW-T2DM IN HKC have sever deficiency in knowledge related to foot-care in T2DM. Therefore, foot care center should be available as part of diabetic center to act as teaching tool plus podiatrist availability who is expertise in primary care in foot health treatment.

PRACTICE & ATTITUDE AFTER HA BEEN DIAGNOSED WITH DIABETES MELLITUS.

4.3.1-SELF EDUCATION

Self-education is the corner stone of diabetes treatment which can open the door for diabetic knowledge to PW-T2DM IN HKC and by it they will follow the right path for appropriate non pharmacological therapy by understanding the nature of the disease and the goal of the treatment. Diabetes self-management education(DSME), the process of teaching individuals to manage their diabetes (National standards for diabetes self-management education program ,1995). has been considered an important part of the clinical management of individuals with diabetes since the 1930 (Bartlett, E.,1986). The result and conclusion that was met by Meta-analysis study to evaluate the efficacy of self-management education on HbA1c in adults with type 2 diabetes were that self-management education improves

HbA1c levels by 0.76% (95% CI 0.34-1.18)) at immediate follow up, and by increasing the contact time increases the effect, which means duration of contact time between the educator and patient was only the significant predictor of effect, with 23.6 h of contact time needed for each 1% absolute decrease in HbA1c. The benefit declines (the decrease on HbA1c by 0.26%) 1-3 months after the intervention ceases, however, suggesting that learned behaviors change over time. This research also suggests the need to develop interventions effective in maintain long-term glycemic control (De Weerdt I., Visser A. and Van der Veen E., 1989) (Padgett, D., Mumford, E., Hynes, M. and Carter, R., 1988).

The low percent of people trying self-management education because of unavailability of well- structured diabetic program which could help the illiterate and low-educated individuals. this survey demonstrates that 0.0% people had attended any structured diabetic program. As a consequence of this deficiency a fair proportion of them don't know how to use glucometer device for blood glucose monitoring (41.5%) and large proportion of them don't have and don't know how to use blood pressure instrument. In developed country, one of the diabetes-related objectives of healthy people at 2010 (Huang, M., Hsu, C., Wang, H. and Shin, S. ,2010*),* is to increase to 60% from the 1998 baseline level of 40% the proportion of individuals with diabetes who receive formal diabetes education.

As a result of this study and estimation in practice and attitude of PW-T2DM IN HKC, there is sever deficiency in self- management education due to absolute absence of any structured diabetic program which its aim is to enhance self-learning in non-pharmacological management of T2DM by using different educational techniques which have evolved over the last decade that have shifted from didactic presentations to interventions involving patient empowerment (Funnell M., et al. 1991), with participation and collaboration.

The goals of self-management education are to optimize metabolic control, prevent acute and chronic complications and optimize quality of life, while keeping cost acceptable (De Weerdt I., Visser A. and nVan der Veen E.,1989) or by offering it as a free service.

assessment of self-management skills and knowledge of diabetes and all kind of health care should be reviewed at least annually (Marshall H., et al. 2004) and the provision or encouragement of continuing diabetes education should be encouraged whenever possible (Imai, S. et al., 2008).

4.3.2- glucometer reading

This study shows a poor direction towards correct methods of using glucometer due to apparent lack of organized health instructions given to the patients during their follow up at health care facilities and clinics of different kinds. 30.5% of them don't follow up the reading of glucometer regularly or trying to search medical attentions for abnormal readings (table 3.16).

As a result of study and estimation, PW-T2DM IN HKC have inadequate knowledge to sever deficiency in how to use glucometer and timing of the measurement.

4.3.3-BLOOD PRESSURE

As a result of this estimation, PW-T2DM IN HKC have sever deficiency in knowing the importance of Blood pressure follow up, in using and owing of Blood pressure device (table 3.17).

4.3.4-HOME MANAGEMENT OF HYPOGLYCEMIA

In early stage of hypoglycemia, symptoms may signal to the patient the necessity to quickly follow the usual precautions to prevent hypoglycemia from progressing, usually by intake sweet drink or food and stop AHM administration immediately but if hypoglycemia gets worse or frequent then patients seeks emergency medical consultation. 190- 195 of PW-T2DM IN

HKC follow up the first two steps successfully that their need for medical consultation only in 44 of them. This may explain the low percent of them know about fainting and seizure as hypoglycemic symptoms. Additionally, the high carbs content of Iraqi meals makes hypoglycemia less common than other countries, 32.0% of PW-T2DM IN HKC had faced hypoglycemia previously and it had been faced once by 24 participants while it was faced several times by 40 participants. The irregular use of AHM by PW-T2DM IN HKC also may play role in decreasing its incidence and its complications; 4 people experienced seizure as a consequence of it, but no one had coma according to the to the data of this research, due to its sequel on central nervous system Hypoglycemia is an important subject to discuss as non-pharmacological management in Diabetic counselling.

The correlation between knowledge and duration of the disease was positive in this study (Pearson Correlation= 0.0.297, p value< 0.001).

4.3.5-OBESITY

The **obesity** was 54.0%, the **overweight** was 36.5%, Their **BMI** range from 18.13 – 48.89 kg/M^2 with a Mean ± SD of 30.72 ± 5.05 kg/M^2 which indicated the obesity was common between participants. It's well known the association between T2DM and obesity (WHO,2020). Though, there are many reasons for uncontrolled weight in PW-T2DM which were also displayed in this study, the high fat and increased glycemic index of usual Iraqi meals are important reasons particularly in poor people who ae financially had restricted food selective choices, not forgetting the inadequate practice of healthy life style in PW-T2DM IN HKC.

It was reported by recent studies that life style intervention could decrease the incidence of diabetes by 58% and this was achieved by intensive diabetic program aiming to achieve and maintain at least 7% of weight loss and 700 calories/week of physical activity (Marcus, B. and Stanton, A., 1993) (World Health Organization, 2020) (Wing, R., 1996)

As a result of study and estimation, PW-T2DM IN HKC have sever deficiency in their attitude and practice toward losing weight. The correlation between the percent of knowledge score and BMI revealed negative correlation (negative correlation coefficient, Pearson Correlation= -212, p value=0.003). this could be explained by the wrong attitudes and malpractices PW-T2DM in regards keeping balanced diet, controlling body weight, practicing regular exercises and who were un educated or had no enough knowledge of life style modifications and didn't have determination and commitment to adhere to the healthy life style modification, as a result of lack of acquaintance of basic Diabetic Knowledge and its scientific attitudes and practices. The more the knowledge the best figures of BMI will be.

4.3.6-SMOCKING

smocking can increase the risk of atherosclerosis. Therefore, deadly combination of high blood glucose and smocking dramatically increase the damage to the blood vessels speeding up the microvascular and macro vascular complications in diabetes patients (Diabetes Canada Website.(2020,

According to WHO (2019), smocking is one of important modifiable risk factors in Non-communicable disease. Therefore, adoption of tobacco cessation program is proven effective in smokers particularly in workplaces)Health organization and World Economic Forum ,2007), this program established in developed countries aims to help smokers how to plan and implement this plan to stop smoking. the correlation between knowledg score and smoking is negative which means 66.0% of smokers had inadequate knowledge while 83.0% of non-smoker also had inadequate knolwedge, p value= 0.010, the explanation of this corelation could be that the trend for diabetic patients to be smokers is related to family and friend's surroundings and social effects more than be the effect of knowledge or . .level of education

4.3.7-MEDICAL CONSULTATION

Most of the patients with T2DM (61.5%) searched immediate medical consultation when they noticed abnormal symptoms that may be related to diabetes and its complications. 33.5% of them seek medical attention after a month, 5.0% after a year, the late consultation was either due to poverty or unknowing their symptoms related to diabetes or it could be ignorance because they underestimated the severity of the disease.

As result of this study and estimation, PW-T2DM IN HKC have adequate attitude toward searching immediate medical consultation.

4.3.8-EXERCISE

Exercise is part of physical activity. Physical inactivity is the leading of the risk factors for global mortality (6% of deaths globally) and moreover it is estimated to be the main cause for approximately 27% of diabetes and 30% of Ischemic heart disease World)Health organization and World Economic Forum ,2007), There is strong scientific evidence that healthy diet and adequate physical activity (i.e.≥ 30 minutes of moderate intensity physical activity, ≥ 5 days per week) play an important role in the prevention of these diseasesworld) Health organization and World Economic Forum ,2007) (Wing, R., 1996). it's imperative to educate the patient about the effect of the exercise on the blood glucose and how to adjust the medication and what is treatment steps should be taken in case occurrence of hypoglycemia as a complication of exercise (Mansell K. and Arnason T., 2014). The speed, amount, timing and duration of it through the day should be conditioned with the patient musculoskeletal and cardiorespiratory system, increase in exercise parameter such as exercise time, speed, repetition or resistance should be no faster than 5-10% per week (Talia A., Scherger J. and Dickey N., 2017).

Emphasizing the fact that education is the cornerstone of the non-pharmacological management, physical activities education is an important part of it. It's of significance to mention these points;

-the earlier during the day a patient exercise, the more likely the patient will keep it up, morning or at lunch is preferable.

-teach the patients how to time their meals and /or regulate food consumption in relation to the exercise to ensure safety by avoiding hypoglycemia.

-the musculoskeletal and cardiorespiratory system have a natural growth of pace that certain amount and kind of exercise should be conditioned accordingly (Talia A., Scherger J.and Dickey N., 2017).

Only 22.5% of people with T2DM IN HKC exercise because PW-T2DM don't recognize exercise as a non- pharmacological therapy that could improve glycemic status.5.5% of exercisers practicing ≥ 5 times a week and 22.0% practiced exercise for duration ≥ 30 minutes, mostly walking exercise, 3.5% practice aerobic exercises, 2 individuals had hypoglycemia during walking exercise.

Recent evidences had reported that significant lower in HbA1c level after exercise and it helps in reducing diabetic complications (Boule NG. *et al*,.2001). Most of house wife participants thought the home duties as exercises, whereas, WHO identify exercise that is planned, structured, repetitive and purposeful movements in the sense that improvement or maintenance of one or more components of physical fitness is the objective. WHO considered house duties as subcategory of physical activity which should not be mistaken with exercise. Physical activity includes exercise as well as other activities which involve bodily movement and are done as part of playing, working, active transportation, house chores and recreational activities (World Health organization and World Economic Forum, 2007). Some of participants found no place to practice exercise, the only way for most men participants who practiced exercise is by walking from home to city center or during their work as many of them (36%) works as wage earners. Exercise is a way to weight maintenance after elective weight loss

as approved in retrospective studies of treatment for obesity (Schoeller DA, Shaky K and Kushner RF, 1997).

As result of this study and estimation, PW-T2DM IN HKC have sever deficiency in their attitude for practicing exercise.

4.3.9-HEALTHY MEALS

Fruits contain minerals and vitamins and its consider as an essential healthy food component. Systemic review and meta-analysis of randomized controlled cohort studies inclusive of people with diabetes have shown that higher Intakes of fruit and vegetables (> 5 servings/day), fruit alone (> 4 servings/day) is associated with a decreased risk of cardiovascular and all-cause mortality (Tsilas CS, de Souza RJ, Mejia SB, et al., 2017) (Talia A., Scherger J. and Dickey N., 2017).

People with T2DM in HKC don't know how much fruit they should administer and don't know what does serving means, therefore for each 1 means complete piece of fruit, in this survey 26.5% don't take any fruit because of poverty, 37.5% have 1-2 pieces of fruits, the rest 16.0% have 3-5 pieces of fruits.

Multigrain bread is less glycemic index than white bread and contains a lot of fibers which give the feeling of satiety which help in controlling the weight, 37.0% of people with T2DM usually have multigrain bread with meals mainly, 27.0% sometimes have it and 14.5% don't have it at all.

Counting calories in meals is sometime used in dealing with overweight, or in insulin user to avoid hypo or hyperglycemia and to achieve target glycemic control. Calorie counter should have educator to teach them, and should have motivation to make it, in HKC, the percent of PW-T2DM in poverty is 42.0% and the rate of illiteracy is 31.5% , these percent of PW-T2DM really need attention and education. according to this research, the percent of

people who count calorie intake is 1.5%, 96.0% don't, 2.0% sometimes they do.

These are some kinds of many beneficial information that should simply provide to the Diabetic patients helping them feel that they are supported and being taking care of them in small but important details of their lives in relation to their food's world.

Diabetic patients in Karbala city understood that they know little about healthy meals in diabetes mellitus particularly the relation between different kind of foods and increasing blood glucose, basically, they understood sugar and sweets are red line for them since its clearly rise plasma glucose, while other different components of foods are unclear for them. Counselling about nutritional elements like how much serving of fruits and vegetables per meal and per day is important.

I noticed some patients feel sadness since they are unable to share their families the usual Iraqi meals that they like because of its high carbohydrate contents, or avoiding some kinds of fruit which they are interested in it and used to have since they were young like for example dates. Counselling about reasonable quota of sweet per week in the setting of healthy foods diet is unlikely to derail the patient's treatment plan. Mindfully savoring a sweet allows one to fully enjoy them because an attempt to ban sweets usually backfire and emotionally the patient will be revolt (Talia A., Scherger J. and Dickey N., 2017) .

As a result of this study and estimation, PW-T2DM IN HKC have inadequate attitude toward healthy meals including the kind and right amount of vegetables and fruits, severe deficiency in their attitude for including multigrain meals, very sever deficiency in knowing how to count calories in foods.

4.3.10-ALTERNATIVE THERAPY

Most of people with T2DM when they feel disappointed by inability to achieve a good control of blood glucose, alternative therapy would be their best choice and almost all who use alternative were using herbs (Table 3.20). unknowing the chronic and progressivity nature of the disease I noticed PW-T2DM IN HKC started herbal therapy before even trying AHM, and then after the disease got to different stages of presentations and complications with the time, most of them got to the satisfaction that herbal therapy will not cure diabetes by itself but may aid in controlling blood glucose together with the use of anti-hyperglycemic medications. Herbal medicine is so popular in HKC that clearly 61.5% are using it as alternative therapy, 5.0% some time consider it (Table 3.20), the high percent of herbal users of PW- T2DM should pay our attention to many subjects related to the nature of different kinds of herbs, safety of its usage, weather it is legally available in herbal stores and if it is under the supervision of public health which should implement certain strategies to prohibit fake harmful herbal substances. Many people with T2DM use home-made herbal preparation from available fresh or dried vegetables and spices.

As result of this study and estimation, adequate percent of PW-T2DM IN HKC have positive attitude toward herbal usage as alternative therapy.

4.3.11-PSYCHOLOGICAL ATTITUDE

To explore the attitudes of PW-T2DM IN HKC towards their disease, I had to look for their ideas and feelings regarding the nature of the disease they have as well as the effect of this disease on their social lives and works. As result of this estimation, adequate percent of PW-T2DM IN HKC think T2DM is due to psychological trauma.

4.3.12-HYPERGLYCEMIA

People with T2DM have faced hyperglycemic attach previously and they were 72.5% and 28.5 % of total participants had admitted to the

hospital because of hyperglycemia, as it is well known hyperglycemia or uncontrolled blood glucose consequently end up with different diabetic complications which were apparent through this study by determining the cause for hospital admissions.

Hyperglycemia status may be recognized by its symptoms or sometime presents with coma, glucometer reading plays significant role in determining hyperglycemia and its level. Most of PW-T2DM IN HKC follow 3 steps when noticing hyperglycemia, stop sweet drink or high carbs foods, take their regular medications and seeking medical consultation.

As a result of this study and estimation, adequate percent of PW-T2DM IN HKC have faced hyperglycemia previously and Excellent percent of PW-T2DM IN HKC followed adequate steps in dealing with hyperglycemia.

4.3.13-Hb A1c FOLLOW UP

Most of PW-DM their HbA1c % laboratory works were ready at the time of filling out the questionnaire (73.5%) and were done within the last three months. It is unknown for me how often or the time intervals for the previous HbA1c% lab works. The available HbA1c% lab works of PW-T2DM IN HKC demonstrate that the mean of their HbA1c% is 10.52 ±2.33 SD. According to the American Diabetes association, there's no one-size-fits all target. A1C level can vary by each person's age and other factors, the goal for most adults with diabetes is an A1c that is less than 7%. In this study 72.5% their HbA1c is out of target. Although 51.5% of people with T2DM are on multiple anti-hyperglycemic medications and 32.0% of them on monotherapy, and most of them using their medications regularly (62.6%), still the glycated mean is out of target, many reasons explain the unachieved glycemic control, first and the most importantly are the high percentage of overweight and obesity between the participants, secondly, poor education of people about diabetes disease and non-pharmacological management. thirdly, poverty which make them unable to afford the expenses of AHM and because 60.5 % of participants indicate that the medications are expensive for them (table

3.24). Other additional factor, 33.0% sometimes use their AHM irregularly for many reasons; 31.0% of people with T2DM mentioned troublesome of medication's adverse effects and 34.0% have fear of being addicted to medications as well as 19.5% of them considered anti-hyperglycemic medications interfere with their fasting. Herbal therapy that fair amount of people believes on it (45.0%) may hinder proper treatment of T2DM. The sum of all mentioned reasons contribute to the high HbA1c mean. The high mean of HbA1c can be managed by continuous medical counselling to correct wrong believes about AHM and to encourage its regular usage, by more focusing on lifestyle modification and to help restore normal body weight. Similar study in Misan governorate in Iraq concluded that only 24% of patients had reasonably good glycemic control as reflected by HbA1c less than 7%(Yasseen y. and Atyia J., 2018). also the same study stated that this un controlled diabetes is not so different from that in other studies in other region. Another study in Basra, the mean of HbA1c was 9.2± 2.1 in 2,123 diabetic patients (Mansour A., Al Hamza A. and Al momin A, 2014)

As a result of this study and estimation, although there is adequate HbA1c follow up, mean HBA1c level is out of target in adequate percent of PW-T2DM IN HKC.

The correlation between knowledge score in percent and HbA1c is negative (Pearson correlation is - 0.246, p value =0.003) in this study. This result may have explained by the fact that that PW-T2DM may have wrong attitudes and practices as I explained above in spite of possibility of having adequate knowledge of diabetes mellitus.

4.3.14-FASTING BLOOD GLUCOSE

Another blood work was involved in this research, fasting blood glucose was obtained from 99 individuals with T2DM (49.5%) whose blood works were available at the time of the interview either by hands or from their charts whether from diabetic centers or from health center diabetic patient's

charts. The mean of fasting blood glucose blood works for 99 people with T2 DM is 242.98 ±69.93.

As a result of this estimation, there is an inadequate availability of FBG in PW-T2DM IN HKC.

4.3.15-RANDOM BLOOD GLUCOSE

PW-T2DM IN HKC mostly depended on RBG levels to know their hyperglycemic status, every participant knows how much his random blood glucose weather it was done at the day of interview or at different time not exceeding 2 weeks.

As a result of estimation, most PW-T2DM IN HKC depend on RBG as a mean for follow up

4.3.16-RETINAL SCREENING

77.0% of PW-T2DM examined their eyes by ophthalmologist after have been diagnosed with T2DM, 52.0% of them their examination was within 5 years, this figure reflects In-adequate practice as the retinopathy progress rapidly in uncontrolled T2DM after 5 years from the diagnosis. Retinopathy of T2DM is the leading cause of blindness and it can be treatable in its early course (Diabetes Canada website,2020). The suggestion is to have ophthalmologist and eye exam center as part of diabetic center for patient's convenience and make strategy to get patients examined their eyes without missing it.

4.3.15-FASTING LIPID PROFILE

PW-T2DM had good practices in following up the laboratory works including fasting lipid profile. 31.5% had abnormal results of fasting lipid profile, this result encourages us to think of importance of dietitian in diabetic center as diet of low fat is the first step of dyslipidemia management (Diabetes Canada website ,2020).

4.3.16-EDUCATIONAL RESOURCES

The education of PW-T2DM IN HKC was from different resources such as; primary care doctors, specialists, pharmacists, family & friends, electronic media, scientific brochure and magazines. The highest percent of participants received their disease's instruction and education from their families and friends (77.0%), this study reveals the fact that family effect has a high significant role about the kind of given education and its consequences on diabetic individual's ideas, feelings and then his practices and attitudes. The family influences have multiple directional effects, there may be negative impacts of family effects due to illiteracy, ignorance and health malpractice of family members which could badly effect the management of diabetic patients, for example, some families could encourage a diabetic family member to not administer AHM for a long time fear of it may cause addictions, or considering diabetes short course disease could be resolved by avoiding carbs while the patient may need multiple medications. On the other hand, the positive impact of families' role includes their different kinds of support such as social, psychological and financial aids. Accordingly, attention should be paid to this important family role in achieving long run of adequate glycemic control and this can be done by involving not only the patients but their families in a regular constructed educational program in diabetic centers to correct wrong believes, address malpractices and faulty attitudes.

89% of PW-T2DM consulted internist to diagnose and follow up their disease (figure 3.3), and 60% of them considered the specialist as their source of education. Therefore, the specialist is their first medical educational resource and sometimes the only one for this. Specialist whether in clinic or in diabetic centers has limited time to address all multiple and complicated medical issues related to diabetic patient. Plus, the large number of patients who all attend at the same time and asking to be seen as soon as possible, will more impair the specialist role in providing all required educations and

instructions. The primary physicians will appear as an essential alternative who could hold the responsibility of complete provision of diabetes education and instructions to the patients. Additionally, primary care doctors can participate in following up the patients and arranging consulted referral in complicated cases. In this research 33.5% PW-T2DM were consulted and educated by primary care while 38.5% percent of them considered electronic media as their information source. This upper hands for the percent of PW-T2DM IN HKC whom their educational resources other than the one for primary care raise many questions about how to improve primary care doctor's competences in terms how to promote their degree to grant high qualification degrees and increase competency and practice in diabetic centers.

12% of PW-T2DM read scientific magazine justified by the fact only 16.0% of them are holding university education.

0.00% were for Dietitians consultations, in spite of their supposed unique functions in diabetic center as diet consultants, their unavailability in HKC diabetic center need to be reconsidered.

In spite of, 69.0% of PW-T2DM have multiple resources of educations, their knowledge is mostly either inadequate or deficient depending on the kind of resources, information qualities, and the scientific level of educators and receivers.

4.3.17-SOCIAL EFFECT OF DIABETES

Social impact of the disease on PW-T2DM IN HKC is mainly the great influence on decreasing the social activities that usually people used to practice due to the symptom's influences of DM, the most symptoms interfere with patient social activities are blurred visions and frequency of urination, other less frequent symptoms are pain, fatigue. When the disease duration gets advance, the symptoms of complications appear like blindness, leg amputation, stroke or heart disease symptoms at which social isolation

may occur. In this study, 62.5% were suffering decreasing social activities mainly because of suffering multiple symptoms (61.0%).

4.4-ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE IN PATIENTS WITH TYPE 2 DIABETES MELLITUS IN THE STUDY GROUP.

4.4.1-EVALUATION OF T2DM KNOWLEDGE BY PW-T2DM IN HKC

An excellent percent (88-99%) of PW-T2DM answered correctly to 6 multiple choices include: 1-recognition diabetes as non-communicable disease. 2-blurred vision as a symptom of T2DM. 3- dry mouth as a symptom of T2DM.4- Dry mouth as a symptom of T2DM. 5- Glucometer use to recognize low blood glucose.6- Glucometer use to recognize high blood glucose.

An adequate percent (60-79%) of PW-T2DM IN HKC had correct responses in 11 multiple choice-questions in questionnaire include; 1-identification DM as a condition of high blood glucose. 2-identifying 3 symptoms of DM correctly (feeling tired, frequent urination and irritable) in 3 multiple choice-questions. 3-identifying 2 complications correctly (blindness and renal failure) in 2 multiple choice-questions 4- identifying regular healthy meals as a healthy life style. 5- T2DM associated with complications .6- T2DM is serious and not treatable Glucometer use to provide immediate feedback of food effect. 8- Glucometer use to provide immediate feedback of food effect, (table 3.34; the excellent, adequate and inadequate percent of PW-T2DM with correct responses).

Therefore, the total multiple choices question had been responded by excellent and adequate percent of PW-T2DM IN HKC are 18 questions using 60% as a cut off percent.

While an Inadequate percent (30-59%) of PW-T2DM had responded correctly in 23 subjects of multiple choice questionnaire include: 1-identifying diabetes as a chronic disease needs lifelong treatment, 2-identifying diabetes as a progressive disease over time. 3- the need of life

style therapy in T2DM. 4-identifying Insulin as an option in diabetes therapy. 5- weight change in T2DM. 6- may have all listed symptoms together in T2DM. 7-identifying heart disease, stroke as T2DM complications in 2 multiple choice-questions. 8- wrong believe of no complication in T2DM. 9-hereditary as a risk factor. 10-un healthy life style as a risk factor. 11-HTN, obesity as risk factors in 2 multiple choice-questions. 12-gasric upset as adverse effect of medication. 12-change in body weight as adverse effect. 13- recognizing the high carbs or fatty foods. 14-regular exercise as a healthy life style. 15- Loss of limb as a complication. 16- Neuropathy as a complication. 17- Timing of the eye exam. 18- Can be treated by Herbs. 19-Tremor & fear as symptom of hypoglycemia. 20 - Sweating & palpitation as symptom of hypoglycemia. 21- Fainting as a symptom of hypoglycemia.

Accordingly, 1nadequate percent (30-59%) of PW-T2DM responded correctly to 23 multiple choice-questions.

The deficiency in diabetes knowledge represents the low percent of PW-T2DM who responded correctly to the multiple choice-questions in questionnaire include: 1-identification Diabetes due to lack of insulin. 2-T2DM due to Insulin resistance 3- Role & amount of vegetable & fruits. 4-wrong answer of Short course of medication may cure Diabetes. 5- Obesity as a risk factor. 6- HTN as a risk factor. 7- Foot self-examination. 8-Identification black line as gangrene. 9-The need for immediate Ophthalmological consultation. 10- The need for special Diabetic shoes & socks. 11- Seizure as a hypoglycemic symptom. 12- Vegetables and fruits as important healthy nutrient in T2DM.

Accordingly, deficient percent (0-29%) of PW-T2DM who responded correctly in 12 multiple choice questions.

As a result, the total multiple choice questions that had been responded by Inadequate or deficient percent of PW-T2DM IN HKC ARE 36 questions.

Considering 60% of PW-T2DM as cut off point between adequate and Inadequate knowledge. Therefore, the, ≥60.0% of PW-T2DM have adequate-excellent knowledge in 18 multiple choice questions.

> 60.0% of PW-T2DM have inadequate- deficient knowledge in 36 multiple choices questions

IN CONCLUSION, PW-T2DM HAVE INADEQUATE-DEFICIENT KNOWLEDGE IN IDENTIFIED BASIC DIABETES KNOWLEDGE.

In other ways, quantitative statistical study of the Knowledge of patients with Type 2 Diabetes Mellitus in this study group was also concluded.

The mean of knowledge score is 41.34% ± 19.92% SD with 41.34-47.11 95 Confidence interval. The mean of knowledge score also showed inadequate knowledge.

4.4.2-PRACTICE AND ATTITUDE OF PW-T2DM IN HKC

Summary of Attitude and Practice

PW-T2DM demonstrate excellent attitude and practice in their satisfaction that their diseases need internist consultation, the high percent of hyperglycemia they undergo made them feel it should be treated by specialist. They depend mainly on Random blood glucose to follow up blood glucose status. in most cases they use their medications regularly because they think the disease untreatable and serious and also they receive a good family encouragement regarding this issue. Most of them have no fear of AHM addiction as some PW-T2DM IN HKC do and thinking it's not interfere with their fasting and has no side effect. Most of the time the AHM are expensive for them and may be because of this or due to believes in herbs, alternative herbal therapy is the most common choice for them as substitute to AHM or in combination with it. The percent of hypoglycemia episodes are low because of immediate good steps in dealing with it at home and also because of the nature of high carbs Iraqi meal which most of PW-T2DM show

no avoiding to it. On other hand, hyperglycemic episodes are in high percent between PW-T2DM IN HKC due to high percent of overweight, obesity, and low percent of exercise practice and high percent of not following other ways of healthy life styles. They have good steps in dealing with hyperglycemia at home as well as in immediate medical consultation when needed it. Most of PW-T2DM IN HKC think diabetes is due to sudden and sever psychological trauma. T2DM apparently effect on their daily life due to its annoying symptoms and complications, the most social effect is decrease in social activities, the most psychological effect is sadness and worries and work effect is disturbance in job field. They depend on Random blood glucose to follow up blood glucose status. Most of PW-T2DM IN HKC are nonsmoker. PW-T2DM IN HKC demonstrate Inadequate and deficient percent in practices and attitudes in many areas, listing the first one that most of PW-T2DM think T2DM can be treated by herbs and they are slow in seeking immediate medical consultation after having symptoms and complications of diabetes particularly in hypoglycemia. The percent of hypoglycemia is low in contrast to high percent of hyperglycemia and this is for sure due to lack of knowledge in healthy life style including practicing exercise, weight control and un healthy meal pattern since most of them don't know how much of vegetable and fruit serving should have every day plus the inadequate percent of them who avoid high carbs or fatty foods plus not involving multigrain bread in their meals and have no idea of calorie count. The unknowing of healthy life style is due to sever lack of self-management education and unavailability of well-structured diabetic program in diabetic center in HKC. The absence of diabetic -educational program or instruction reflected negatively on their attitudes and practices about how to use glucometer, timing of its use and follow up its readings to achieve adequate glycemic control. As well as, they follow up its readings to achieve adequate glycemic control. In addition, they have deficient knowledge in how to use Blood pressure machine and the importance of owing it which is for fast and continuous Blood pressure monitoring. They have inadequate practice and attitude towards the eye

exam weather within 5 or 10 years and the same for availability of HbA1c% and Fasting Lipid Profile laboratory works. On the other hand, the positive side is the Inadequate percent of PW-T2DM IN HKC that had hospital admissions for different causes. Beside deficient diabetic education or instruction, PW-T2DM have inadequate practice in healthy life style partly because Family support are inadequate whether in preparing healthy diabetic food, encouraging exercise practice or in quitting smoking and partly because they have low economic status to afford special diabetic food. The idea of them regarding the etiology of diabetes is little in regarding the hereditary, environmental or both of them as the cause.

According to the figure 3.8, The PW-T2DM IN HKC divided in 3 groups according to the percent of participants who responded correctly to the questions associated with practice & attitude. There were 14 practices and attitudes that excellent percent of PW-T2DM had. 6 practices and attitudes an adequate PW-T2DM IN HKC had. Total sum of practices and attitude that have been adopted by excellent and adequate PW-T2DM are **20.**

ON the other hand, there are 13 practices and attitudes that inadequate PW-T2DM had. 16 practices and attitudes that deficient PW-T2DM had. Total sum of practices and attitudes that have been shown by inadequate and deficient percent of PW-T2DM **29.**

IN CONCLUSION, THE TOTOAL SUM OF PRACTICES AND ATTITUDES THAT HAVE BEEN ADOPTED BY PW-T2DM ARE INADEQUATE AND DEFICIENT and MORE THAN THEIR EXCELLENT-ADEQUATE PRACTICES AND ATTITUDES.

The average for total regular positive practices is **0.399 ± SD 0.2536 (39.9% ± SD 25.3%), confidence interval 0.4544 - 0.3990, range 0.94** , which is categorized as **In- adequate**.

The **first Rank** for regular positive practices was for dealing with hypoglycemia in three steps (Mean 0. 0.955 ± SD 0.207), the **second Rank** was for dealing with hyperglycemia in three steps (mean 0.825± SD 0.380)

and the **third rank** was for completeness of HBA1c Laboratory work (mean 0.735 ± SD0.442).

The average for total regular positive attitudes was **0.482 ± SD 0.2929 (48.2% ± SD 29.2%), confidence interval of 95% 0.5232 - 0.4420, range 0.86, which** is categorized as **in-adequate** too.

The **First Rank was** for regular positive attitudes is Internal specialist consultation (mean 0.89 ± SD 0.313), the **second Rank** was for Anti-diabetic medication' doses not interfere with fasting (0.805 ± SD 0.397) and the **third Rank** was for No side effect of Anti-diabetic medications (0.69 ± SD 0.463).

4.4.3- The analysis of the correlations between Variables

1. The Pearson correlations between Knowledge and regular positive attitudes and practices were positive but the P-Value was not significant. Same results for Pearson correlations between regular positive practice and regular positive attitudes and each one of them and mean of HbA1c, This could be explained because of bias and significant effect of confounding factors on the knowledge status as it is clear from the results.
2. The correlation between Knowledge and other confounding factors are positive e.g. gender, level of educations, economic status, crowding index, work and smoking when P-Value was significant. This correlation indicates that the **in- adequacy** of knowledge was highest between female patients who are house keeper, poor and divorced, also in both sex who are illiterate, poor and jobless. the highest adequate knowledge was in university graduated patients who have good economic status and who are employed.
3. Pearson correlations were negative between Knowledge and Mean of HBA1c, BMI mean but positive with duration of the disease when P-Value was significant.

4. The researcher also observed a positive correlation between knowledge and duration of the disease when P-Value is significant.
5. Quantative study concluded that knowledge, attitude and practice were In-adequate and deficient.
6. It can therefore have deduced that improving the PW-T2DM education and awareness in basic diabetic facts and its non-pharmacological management can achieve a significant positive upgrade in terms of attitudes and practices to achieve significant recovery in glycemic indexes and BMI as it is noticed from the results that increases in knowledge status decrease HbA1c and BMI levels. PW-T2DM in HKC are willing to learn as the acquaintance of knowledge increased with increased duration of the disease, the time frame is important when the unrecovered complication can be prevented earlier in the course of the disease than later by early identification of diabetic knowledge to PW-T2DM and enhance their familiarity with convenient and scientific attitudes and practices in this disease.

4.5-COMPARISON THIS STUDY RESULT WITH OTHER RESEARCHES

4.5.1-In knowledge, Attitude and Practice of Diabetic patients in the United Arab Emirates (Al-Maskari F. *et al.*, 2013). the conclusion of this study was similar to my result in respect with diabetic knowledge, the study showed low levels of diabetes awareness in the UAE. The other points of similarity are that only 27% of patients had good glycemic control, 57% had HbA1c level reflect poor glycemic control, majority showed no exercise practice, 76% cannot differentiate between high or low glycemic food index and 72% of patients in UAE had negative attitude towards diabetes although most of them showed compliance with medications. This article also indicates that studies from both developed and developing countries have reported that diabetes knowledge is generally poor among diabetic

The differences in results include satisfactory practice particularly notably positive attitude towards controlling blood glucose and body weight.

The result of practice was satisfactory in UAE while with PW-T2DM IN HKC was slightly inadequate, the difference is due to notably positive attitude towards controlling blood glucose and body weight in addition to recent advancement in UAE in each health aspects mentioning one of them is by offering the diabetic educator services since the initial diagnosis of diabetes.

4.5.2- A study in Misan governorate in Iraq by ,Yaseen Y., Atyia J. (2018) concluded that only 24% of patients had reasonably good glycemic control as reflected by HbA1c less than 7%.

4.5.3-An article for Mansour A., Al Hamza A. and Al momin A. ,(2014) in the research for pattern of Anti-hyperglycemic medication used in subjects attending the diabetic center in Basra, Iraq, it was found that the general practitioners were less likely to recommend change in treatment for a patient inadequately controlled on Sulphonylureas, despite the ample evidence of side effects and their inability to sustain long-term glycemic control. He also concluded that self-prescriber is the highest while internist prescriber is higher than GP prescriber. These 2 conclusions support my results for the highest internist consultation percent than the one for GP and the need to upgrade the GP competency by continues medical education or intensive courses in diabetes (Mansour A., Al Hamza A. and Al momin A, 2014)

4.5.4-The result of evaluation of T2DM related knowledge and practices of Omani patients is different from my result, Omani people seemed aware and displayed satisfactory diabetes knowledge and good practice except adherence to regular exercise .(Al Bimani Z., Khan S., David P.,2015) The reasons for dissimilarities are the simplicity and quality of questions used for the assessment for e.g. the clarification about if diabetes is associated with complications was direct without going into the details of what kind of complications. The number of question was used is 15 close ended or

multiple choices questions. Additionally, the educational level and economical level were not considered and didn't correlated with the level of knowledge. While in PW-T2DM IN HKC 38 multiple choices questions with multiple branched-questions. PW-T2DM IN HKC were tested for wider scope of knowledge and attitude. Their educational and economical levels were taken into consideration.

4.5.5- Recent evidence in developed countries shows that there are significant knowledge and skills deficits in 50-80% of patients with diabetes (**Raveendran**, A., Chacko E and, Pappachan J. 2018).

4.5.6-A study taken in 2018 reviewing self-management practices in type 2 Diabetics in Baghdad showed that an alarmingly high number of patients were unaware of the positive effects of self-management **(**Mikhael, E., Hassali, M., Hussain, S. and Shawky, N.,2018). In fact, none of the participants in the study were informed about meal planning for diabetics, and all had different ideas of what 'eating healthy' is! (Mikhael, E., Hassali, M., Hussain, S. and Shawky, N., 2018).

4.5.7-According to CMAJ, over 2/3 of Canadian men (67%) are overweight or obese and more than half of Canadian women (54%) are overweight to Obese. The prevalence of obesity has increased worldwide (Brauer P., 2015). This prevalence of obesity in Canada is similar to that in this study. The level of education doesn't make a difference between developed and developing country but The nature of diet does in relation with prevalence of obesity.

4.5.8- In the study of Herbal Remedies Use among Diabetic Patients in Nassyria , Iraq(2012), 77.8% of herb user were satisfied with it uses and 79.1% perceived it as beneficial (N. R. Salih and Jasim N. Al-Asadi , 2012). The figure is similar to our study 61.5% of participants of T2DM using herbal treatment as alternative to anti-diabetic medications. the same study demonstrated that the influence of friends in decision making in the way how

to practice non-pharmacological treatment mainly about herbal uses is significant, it reported that 77.1% of herb users were due the influence of the friends (N. R. Salih and Jasim N. Al-Asadi , 2012). In this study 77.0% of PW-T2DM in HKC considered family and friends are their primary source of their education about the disease, in other words, this source of education has its direct influence on their attitudes and practices.

4.5.9- In the study of meta- analysis of controlled clinical trial to study the effect of exercise on glycemic control and body mass in T2DM (Boulé NG ,2001) conclude that exercise reduce HbAIc% by amount that should decrease the risk of diabetes mellitus complications, while there was no significantly greater change in body mass in exercise group compared with control group (the significant post intervention body mass between exercise group and control group was not significant(83.02 Kg vs 82.48 Kg weighted mean difference 0.54:P=.76). This conclusion support somehow my result of our study that that the correlation (Pearson correlation -0.212: P=0.003) between knowledge and body mass index (BMI) is negative.

In the first study there was exercise intervention program but no effect on BMI (Boulé NG ,2001), in our study there was knowledge but no effect on BMI.

The explanation of this that the basic knowledge asked in this study couldn't covered exactly what required knowledge should be asked particularly regarding decreasing body weight, this needs another study to evaluate if the PW-T2DM in HKC have adequate Knowledge particularly of how to decrease BMI. The second point is that beside knowledge and exercise to decrease body weight, participants need self- determination of how to adjust their diet to healthy one and be away from the attractiveness of varied unhealthy foods.

While in the same meta-analysis study (Boulé NG ,2001) conclude that exercise training reduce HbA1c% by an amount that should decrease the

diabetic complications (the weighted mean post intervention HbA1c, was lower in the exercise group compared with the controlled groups (7.65% vs 8.31%; weighted mean difference, -0.66%: P<.001). In our study the correlation (Pearson correlation between Knowledge score % and HbA1c% is -0.246: P=0.003 in 147 participants).

It's understandable the motivation for appropriate attitude and practices is having suitable knowledge connected with applicable practice. In the first study (Boulé NG ,2001) to test their hypothesis, the knowledge of the importance of exercise made the researchers to implement this fact as exercise intervention program which was successful in lowering HbA1c% and made difference. In our study the knowledge questionnaire was mostly general and not specific to certain topic plus it was without any intervention program (cross sectional) as the comparable study did.

60% was used as cutoff point between success and fail, which means even with successful knowledgeable participants there were 40% of information still missing, this information could be the required for life style modification and HbA1c% reduction as a consequence.

4.5.10- In a study of a web based intervention for low carbohydrate diet in Randomized controlled study for 16 weeks (Dening J. et al,2023) , the researchers concluded low carbohydrate diet intervention through a web based follow up significantly improved glycemic index and clinical outcome in adults with T2DM (there was a statistically significant between-group difference favoring the intervention group, with reductions in HbA1c -0.65% (95% CI: -0.99 to -0.30; $p < 0.0001$), weight -3.26 kg ($p < 0.0001$), BMI -1.11 kg/m2 ($p < 0.0001$), and anti-glycemic medication requirements -0.40 : $p < 0.0001$ in controlled g, with large effect sizes Cohen's $d > 0.8$ (Dening J. et al,2023). This conclusion supports the result of our study that the life style modification's attitudes and practices were inadequate (positive attitudes and practices means 54.1 ± 84.6) due to the lack of interventional programs

(PW-T2DM who attended structured educational program was zero). Consequently, the mean HBA1c% were above the target average (the mean of HbA1c% was 10.52 ±2.33 SD).

Thus, the outcome of this study will pave the way for similar intervention of the comparable study or with different context regarding non-pharmacological management of T2DM in randomized controlled trial in HKC.

4.5.11-In study of evaluating the effect of knowledge, attitude, and practice on self-management in T2DM patients on dialysis (Ghannadi S., etal, 2016) demonstrated that correlation between Knowledge and HbA1c was negative (r=-0.437, P<0.001. in our study the correlation between Knowledge and HbA1c was negative too (0.246, P=0.003).

The correlation score in the same study (Ghannadi S., etal, 2016) between Knowledge and BMI was positive value was insignificant (r=0.004, P=0.963) while knowledge score and BMI was negative in our study (-0.212, P=0.003). In the same comparable study (Ghannadi S., etal, 2016) the correlation between Knowledge and age was negative (r=0.284, P=0.002), the result is close to our study, the association between knowledge status and age demonstrated that 87.9% of Inadequate knowledge status was among age group ≤ 45 years' age and 83.6% of inadequate knowledge in >60 years' age.

4.5.12-In the study in Khartoum teaching hospital at 2016, the result showed that the glycemic index of the participants in the study was not optimal (Ahmed H., Egal N. and Mohamed S., 2016). Will make comparable results in different subjects between two studies referring to the frequency of participants in a certain KAP assessment area;

Comparable study in Khartoum	our Study In HKC
38.0% missed their doses more than twice.	62.6% regular use

46.0% of them their glucose level was 180-250 mg/dl.	Mean ±SD of FBG in 99 PW-T2DM 242.98±69.93
59.0% admitted to the hospital due to diabetic complications.	44.5% admitted to hospital mostly hyperglycemia (27.5%)
36% examine the feet 46.0% examine the eye.	21.5% knew foot care
70.0% eye problem.	13.0% abnormal retinal screening, 0.5% blindness
26.0% diabetic health Education	13.5% self-management education.
34.0% diabetic consultation.	61.5% diabetic consultation
72% of the pw-T2DM had no glucometer	38.5% regular follow up of glucometer readings
The study concluded that they didn't know the importance of diabetic education, taking treatment . in time and eye, feet checking. .	our study concluded the level of diabetic education was inadequate, low level of eye problem, adequate consultation Regular use of medications and glucometer.

(Ahmed H., Egal N. and Mohamed S., 2016).

CHAPTER

FIVE

CONCLUSIONS

&

RECOMMENDATIONS

CONCLUSION

This research has measured the adequacy of knowledge attitudes and practices as well as other factors may interfere with the outcome like socioeconomic status and psychological sequences of T2DM among PW-T2DM IN HKC related to non-pharmacological management. The study observed that The study observed that PW-T2DM In HKC have inadequate-deficient knowledge in identified basic diabetes facts. plus, inadequacy and deficiency of their attitudes and practices (scores for knowledge, regular positive attitudes and practices are 44.1%,48.2%, 39.9% respectively). The researcher also observed a positive correlation between knowledge and duration of the disease and negative correlation with HbA1c and BMI. T2DM in the sample study in HKC has significant effect on daily life with different levels of multiple psychological effects and some effect on the individuals works. It can therefore have deduced that improving the PW-T2DM education and awareness in basic diabetic facts and its non-pharmacological management can achieve a significant positive upgrade in terms of attitudes and practices to achieve significant improve in BMI and recovery in glycemic indexes and consequently improve quality of life and prevent morbid complications. Future research will explore the effect of implementation of diabetic educational programs whether as web-based and or as educational program staff on the level of Knowledge, attitude and practices among a larger number of PW-T2DM IN HKC and in all Iraqi governorates and including longer follow up.

7. PW-T2DM have **In-adequate** knowledge in identified basic diabetes facts, the mean of knowledge score 23.38 ± SD 10.56 (44.1% ±19.92%)

Recommendations

This study has found that it is essential that patients become more knowledgeable about non-pharmacological management regarding TY2DM to foster better health outcomes. Doctors should be encouraged to speak more to their patients about diet and physical exercise. Pamphlets or brochures should also be given to patients to review and take home, and doctors should steer patients to medically accurate literature or websites that patients can view on their own time. the barrier to this recommendation is that some doctors may find it too time consuming to communicate with their patients about Diabetes Mellitus, therefore its necessary to establish different diabetic programs.

1-Diabetes educational program

To enhance self-learning in non-pharmacological management of T2DM. Diabetes education centers should be part of Diabetic center in Holly Karbala city.

2-Development of diabetes association centers

This association concerns about the following

1-Involve educational and services programs aiming to support people living with diabetes in their daily fight to live as well as possible normal healthy lives with diabetes. (En.wikipedia.org, 2020).

1- acts as an advocatory association which its efforts direct to lead the government to develop policies that respect the rights of people living with diabetes to access and ability to afford all the treatment they need to live healthy (En.wikipedia.org, 2020).
2- follow up all the health service related to diabetes care mainly to advocate the rights of diabetic patients to offer them high standard care by ensuring high standard competent physicians and staff and

emphasizing that they are working within the guidelines and according to the policy established by this association.

3- Continues education of people with diabetes by providing information session, forums, diabetic breakfast meeting or diabetic lunch-time meetings with speakers, diabetes experts, healthcare professionals and videos or demonstrations which should be usual part of the sessions.
4- offer wide range of professional health- educational activities like informative scientific lectures or courses to keep the medical and nurses staff updated with information.
5- Develop web-based management which provide health educations and consultation online, recent evidence has been shown to improve glycemic control. (Ralston, J. *et al.*, 2009)
6- establish diabetes program for vulnerable persons with diabetes e.g. the poor elderly diabetic patients, or disabled diabetic patients aiming to advocated their rights in proper and fair treatments by free health services or low cost including different kinds of medications plus ensure their easy access to costly rehabilitation centers.
7- In this program evaluate the presence of barriers to healthy eating e.g. cost of healthy foods and work toward solutions to facilitate behavioral changes including sport's hall, smoking cessation programs (Marcy, T., Britton, M. and Harrison, D., 2011) (Clinical Canadian Practice guidelines, 2018).
8- arrange peer support group; which are a groups managed by people who have T2DM and are working as volunteers and peers within the group members, these groups offer the opportunity for people with diabetes to regularly share their experiences and support each other. Additionally, there are also groups for families of people with diabetes (Clinical Canadian Practice guidelines, 2018).

9- People with diabetes need access to a wide range of tools, including medications, devices (glucometer, sphygmomanometer) and supplies (disability helping aids) for free by Governmental foundation to help them a chive the recommended blood glucose, lipid and blood pressure targets. Health outcomes depend on the managing the disease effectively and without access to the necessary tools and strategies, Iraqi people living with diabetes will not be able to achieve the optimal results, therefore, this association should act to ensure that all level of the government should commit to invest in chronic care management of DM and support the tools needed for successful self-management and to ensure that optimal care can be delivered.

10- help in establishing Diabetes charter which clearly outline the support and the right of Iraqi individuals with diabetes who need to live to their full potential. It defines Iraqi people with diabetes to obtain information, education and care that take in to account a person's culture and language. The charter also puts forth the right of people with diabetes to high quality care regardless where they live, the charter notes that government have a responsibility to address the unique needs and disparities in care and outcomes of vulnerable populations who experience higher rates of diabetes and complications and /or significant barriers to diabetes care and support, these supports including financial aids or monthly allowance that will help Iraqi people with diabetes to manage their disease and related complications.

11- initialization of smoking cessation program to help people to quit smoking by education and using available methods for example nicotine replacement therapy which also help ease withdrawal symptoms (Clinical Canadian Practice guidelines, 2018).

3-Establish Clinical Practice Guidelines for The Prevention and Management of Diabetes.

In Iraq the need to continuous updating guidelines represent the best evidence-based direction for health-care professionals (En.wikipedia.org, 2020). and upgrade the scientific level of Family docors by continous medical educations conferences to obtain high standard and competent doctors in DM and in every scientific fields.Ensure the level of teaching at the medical univerities is up to international levels by close follow up and .strict monthly survey of the medical C

4-Upgrade The Available Diabetic Centers in Iraq

Intensive glycemic control decrease microvascular and macro-vascular complications, most importantly heart disease which is the leading cause of death in T2DM, it's difficult to obtain required glycemic control by specialist role a lone due to the limit time and space usually accompanied an individual work, therefore the suggestions include the following;

1- establish a multi-disciplinary team that can include Endocrinologist, Primary care physicians, Dietitian, well- trained Nurse manager in diabetic subjects, Podiatrists, Fitness experts and others as the clinical situation dictates.
2- The wide breadth of knowledge and skills of qualified Primary care physicians allow them to be excellent providers for diabetes counselling and training in diabetic patient self-management, also in follow up to ensure the patient received all the necessary management in all its directions.
3- Recruitment of a registered dietitian.

Nutrition therapy can reduce glycated hemoglobin (A1C) by 1.0% to 2.0% (Sievenpiper J., *et al,* 2018). and when use it with other components of diabetes care, can further improve clinical and metabolic outcomes (Franz MJ, *et al,* 1995), ((Kulkarni k, Castle G,) (Imais S, *et al,* 2008) (Huang, M., Hsu, C., Wang, H. and Shin, S. ,2010) recent evidence show that simply following diet brochure is unlikely to change lifestyle without the service of Dietitian (Tallia, A., Scherger,

J. and Dickey, N.,2017).People with diabetes should receive nutrition counselling by a registered dietitian and the counselling either individual or a small group counselling (Brekke, H., Jansson, P. and Lenner, R.,2005) and frequent follow up each 3 months with registered dietitian has associated with better outcome (Huang, M., Hsu, C., Wang, H. and Shin, S. ,2010), individual counselling is preferable for people with low socio economic status (Sievenpiper J., *et al,* 2018).

4- Fitness Experts working in Fitness Hall close to Diabetic Center and as a part of its team as part of life style changes, this plan has implemented in developed countries and it was successful in encouraging diabetic patient, medical and health staff to exercise.
5- Encourage the patients to be as active part of the team not just passive recipients of information.

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APPENDIX

Questionnaire of Knowledge, attitudes and practices of patients with type 2 Diabetes Mellitus in respect of non-pharmacological treatment in Holy Karbala City\ Iraq\ 2019

Socio-demographic and general information:

Date.....

1-Name(optional).....2-Age.....3- Gender

4-Address; City..... Town.....Village.....

5-Marital status: single..... married.....divorce..... widowed.....

6-What is your language preference?

Spoken.....Reading.....

7- Occupation..... Work hours.....

8-Weight..... Height..... BMI.....

9-do you smoke? Daily... occasionally...never... stopped... if you stopped smoking how long ago did you stop! year...Length of time.... How many cigarettes per day do/did you smoke?.....for how many years..... are you considering stopping it! Yes..... No..... what is the obstacles.....

Education/ support system

1-Are you able to read.....write..... both read and write ....

2-last grade of school completed! primary..... secondary..... High school.....institute..... university.....others... Illiterate.....

3-How many people are living in your house hold?.....How many bed rooms in your house?.....

4-Does anyone else who lives with you has Diabetes?
Yes.....who.....no...

5-are you financially independent? Yes.....No.....

6-are you in need of certain social and family support?
Yes.....No.....

7- who is your primary support system? Your self..... husband.... wife.... son.....daughter.....father..... mother.... brother..... others.....

8-Who is your decision maker? Your self..... husband.... wife.... son.....daughter.....father..... mother.... brother..... others.....

Diabetes Mellitus History

1-Type of Diabetes Mellitus, type1.....type2.....gestational diabetes.....prediabetes.....

2-when first time you have diagnosed with Type 2 Diabetes Mellitus? age.....year.....

3-Type of medications if applicable and dosage 1-.....2-.....3-.....4-.....

4-are you taking it on regular basis? Yes ..... No.....

5-If No what are the reasons for not taking the medications on regular basis? a-Side effect of medication! Yes... No..., b-expensive! Yes...No..., c- DM is not serious and can be resolved by itself! Yes.... No..., d-can be treated by herbal medication! Yes.... No..., e- No encouragement from the family! Yes..... No....., f-fearing you may get used/addict to the medication! Yes... No... h-interfere with the fasting! Yes...No...

6-who is treating you for DM? primary physician, Diabetes specialist /internist, …Nurse, …. others, …

7-Have you ever had low blood sugar? Yes … When… How frequent… What times of day……No……

8-Ever passed out or had seizure due to low blood sugar! Yes… how frequent……. when…… No…

9-Have you ever had symptoms of high blood sugar! Yes … when……how frequent……have you passed out! Yes… No…

10-Have you ever had problems with infection? Yes… what kind! Gangrene…… burning on urination…… frequent cold…… itching in groin or feet …boils… No….

11-Have you been hospitalized for your diabetes? Yes… No… Date and where hospitalized……What was the problem……

Diabetes Mellitus Type 2 Knowledge evaluation:

1-What do you know about healthy lifestyle?

a-Eating two serving of fruits and five serving of different kinds of vegetables every day? True……False……I don't know……

b- one serving of vegetables means 75 grams of vegetables which means also 1/2 cup of cooked vegetables or 1/2 cup of raw vegetables or 1/2 cup of cooked, dried or canned beans, peas and lentils or ½ cup of sweet corn? True……False….I don't know….

c-one serving of fruits means is equal to 150 grams of fresh fruits which is equal to medium apple, Banana, orange?
True……False……I don't know……

d-Eating the healthiest food in moderate amount and sticking to regular meal times? True.....False.....I don't know.....

e-Exercise regularly for 30 minutes at least two times a week? True.....False.....I don't know.....

f-No smoking weather primary or secondary? True..... False.....I don't know.....

2-Identification of Diabetes mellitus

a-A condition of high blood sugar! True.... False.... I don't know.....

b- Body is not producing enough insulin! True...False... I don't know...

c-Body fails to respond to insulin! True...False... I don't Know...

d-It can be caused by all of them! True... False...I don't know....

e-DM caused by kidney failure! True...False... I don't know...

f- DM is a chronic disease that needs treatment for life long!

True... False... I don't know...

3- Prognosis of Diabetes Mellitus Type 2 is:

a- a short term diseases that resolved without medication. True... False... I don't know...

b- progressive condition over time that treated by lifestyle management and medication True... False... I don't know....

c- A short course of medication may resolve the condition forever. True... False... I don't know...

d- you may need lifestyle changes and high blood sugar medication to decrease blood sugar! True.....False.....I don't know....

e-sometimes insulin is needed to manage blood glucose. True… False… I don't know…

f- DM Can be treated by adopting healthy lifestyle without anti hyperglycemic medications. True…False…. I don't know….

g-DM if not treated properly can lead to different kind of complications including diseases of heart, Kidney, Eyes, and or stroke.

h- DM is a communicable disease.

True…False… I don't know…

4- what are common symptoms of Diabetes mellitus;

a- Blurred vision! True…. False…I don't know….

b-Frequent thirst! True…. False…I don't know….

c-Dry mouth! True… False…I don't know….

d-feeling tired, irritable, lethargy! True…False…I don't know…

e- constant feeling hungry despite having eaten! True…. False…. I don't know…

f-having cuts, sores or ulcers that heal slowly! True…False… I don't know….

g-Itching, skin infections! True…. False…. I don't know….

h-pain or tingling in the lower legs and or feet! True…. False…I don't know……

I-weight changes! True…. False…. I don't know….

k-All of the above mentioned symptoms! True…. False…. I don't know….

5- what are the complications of Diabetes mellitus.

a—Blindness! True.... false.... I don't know....

b-kidney diseases! True.... False.... I don't know....

c-loss of limb! True.... False I don't know.... ...

d-heart diseases! True.... false.... I don't know....

e-nerve diseases! True.... False... I don't know....

f-stroke! True.... False.... I don't know....

g- All of the mentioned above! True.... False.... I don't know....

h- None of the mentioned above! True.... False... I don't know....

i-DM may have presented with common symptoms of diabetes or its complications. True... false... I don't know....

6-Risk factors for Diabetes Mellitus means:

a- you have a family member with DM! True.... False.... I don't know....

b-leading unhealthy lifestyle (smoking, unhealthy eating plan, no regular physical exercises)! True... False.... I don't know....

c- HTN! True...False.... I don't know....

d-increase in body weight! True.... False.... I don't know....

7-The importance of monitoring blood glucose by glucometer is;

a-To recognize low blood sugar, True.... false..... I don't know....

b-To recognize high blood sugar, True.... false.... I don't know....

c-To recognize uncontrolled DM. True.... False... I don't know....

d- To provide immediate feedback about the effect of medication. True…false… I don't know….

e-To provide immediate feedback about the effect of certain kinds of foods. True…False…. I don't know….

8-What are the symptoms of hypoglycemia?

a-tremor and fear. True…False…. I don't know….

b-sweating and palpitation. True…False…. I don't know….

c-fainting. True…False…. I don't know….

d-seizure. True…False…. I don't know….

9-The side effects of hyperglycemic medications are!

1-Hypoglycemia. True…. False…. I don't know….

2-Gastric Upset. True… False… I don't know….

3-change in the body weight. True……False… I don't know….

10-Healthy life style is/are:

a-practicing regular exercises True……False… I don't know……

b-special diet program with diabetes. True……False… I don't know….

c-Quit smoking. True……False… I don't know….

d-All of them. True……False… I don't know….

11-Are you able to distinguish between low and high carbohydrate and unhealthy fatty food items? Yes… No…. I don't know….

If Yes, how? a-by reading the health instruction on the label. Yes…No…

B- by searching it on internet, yes…No… c- taught from family and friends, Yes… No… d- taught by your doctor, yes… No… E-by educational session, yes…. No… F- by registered dietitian, yes…No…

12-Commitment to a healthy diet regime related to having DM disease is Important in controlling DM symptoms and complications! True…. False…., I don't know.

13-The role of practicing structured regular exercise is important in control DM symptoms and complications! True…False…., I don't know.

14-Smoking is a risk factor for: a-DM, True…. False…., I don't know. b-heart diseases, True…. False…., I don't know. c- both of them True…. False…., I don't know.

15-Examination of your eyes by eye doctor specialist should be done after you have been diagnosed with DM type 2 immediately? True…. False…., I don't know

16-Foot care in DM type 2 means:

a-inspect the feet on daily basis for blisters, swelling, cuts, boils, ulcers, True…. False…., I don't know.

B- consultation of doctor in case appearance of black line on foot infection means gangrene which then may end up with amputation of toe, foot, leg. True…. False…., I don't know.

C-it's important to have special diabetic socks and shoes.

17-what is your source of knowledge:

a-primary physician..... b- Diabetic and internist..... c-pharmacist.....e-Diabetic educator.....f- Dietitian..... g- Nurse ..... h- friends and family ..... I-Electronic media (internet and or TV)

k- medical brochure and journals

-Frequency of seeing any one of thos! None..... once a year, twice a year, more frequently than this.....

18-After you have been diagnosed with DM:

1. Have you ever tried self-management education about DM? yes.... No....
2. Have you ever attended well-structured program about DM? yes.... No....
3. Do you know how to self-monitor blood glucose by glucometer? If yes, how frequent..... / pre-prandial.... post prandial.....
4. -Do you have the blood pressure instrument? Yes ... No... if no why? Expensive... I don't know how to use the instrument? Yes... No...I don't know it's important! Yes... No...I used to check my BP at private clinic /hospital! Yes... No...How often do you check your blood pressure! A week...a month... a year...
5. How Do you manage sick days?
    a- In case of Hypoglycemia; sweet drinks or sweet food intake ..... stop anti- hyperglycemic medications or insulin..... Temporarily..... forever.... Doctor clinic/hospital visit! yes.....No.....
    b- In case of Hyperglycemia: avoid sweet drinks and food.....increase the dose of anti- hyperglycemic medications and insulin..... Doctor clinic/hospital visit.... treated at home..... visit traditional - healer
6. Do you know how to adjust your medication in response to changes in diet and activity? Yes.... No....
7. Have you ever tried to control your body weight? Yes.... No....

8. if overweight have you ever tried to lose weight by a- reduce total calories consumption.... b-exercise....C-herbal medication.... D-consult a doctor.
9. Did you make an appointment with your doctor when you noticed symptoms and complications of DM? a-Immediately...b-After one mon.... c-After one year.... d-Non..... reasons of delayed consultation: financial barriers.....difficult traffic.....unable to make decision..... fear of doctors.....
10. Do you exercise regularly? Yes..... No..... how many times per week? Once..... Twice..... More. .... Type of exercise..... usual time of day.....length of time.....problem with exercise-related low blood sugar reaction? Yes..... No.....
11. how many serving of vegetables per day? one... two ... three.... None...how many serving of fruits per day? One.... two.... three.... none.... how many serving of multigrain bread per day? One .... two.... three..... none.
12. Do you avoid fatty food or fast processed food? Yes.... No...could you distinguish between different types of fat? Yes.... No.....
13. Do you avoid high carbohydrate food? Yes...No...
14. do you count the carbohydrate in your meals? Yes... No...
15. Are you considering alternative treatment for DM other than lifestyle changes and medications? Yes.... No..... what are they?.....
16. Did you examine your eye by eye doctor after you have been diagnosed with DM? Yes..... No..... when? after diagnosis of DM immediately? Yes..... No ..... within 5 years of diagnosis of Dam? yes..... No..... within 10 years of diagnosis of DM or more? Yes.....No.....
17. Do You Know how to care about your feet? Yes..... No.....

18. Are you seen a traditional healer? Yes.... No....

19. Are family supportive for your treatments needs? Provide money! Yes.... No.... Help in preparing a healthy food! Yes... No...Encourage you for exercising! yes...No..., Encourage you quit smoking! Yes.... No...., Encourage you to stop alcohol drinking! Yes..... No....
20. Do you have enough money to prepare special low glycemic food index meals (vegetables and fruits, multigrain bread, chicken and fish)? Yes..... No.....
21. What in your opinion the reason for having DM disease? Hereditary.....psychological trauma .....
22. How do you feel after you had DM? Depression..... worries.....sadness.....denial.
23. Does DM disease effect your daily life? Yes.....No.....sometimes.....
24. What is the effect? Decrease social activities ----------pain..... fatigue.....Blurred vision..... frequent urination.....impotence.....
25. Does DM affect your job practice? Yes..... No.... If the answer yes, how? Early retirement.....leaving the job.....decreasing work hours.....disturbance in the work.....
26. What is your latest result of the following;
    1) Hemoglobin A1c! Month/year..... Result..... I don't know...
    2) Random blood glucose! Month/year..... Result.....I don't know.....
    3) Fasting blood glucose! Month/ Year..... Result.....I don't know.....
    4) Fasting lipid profile! Month/ Year.....Result.....I don't know.....
    5) Retinal screening! Month/ Year.....Result.....I don't know.....

The End

Thank you for your help.

استمارة استبيان حول معلومات ,سلوك وممارسات المرضى المصابين بداء السكري نوع الثانى حول اختيارات العلاج الغير دوائية في محافظة كربلاء المقدسة، العراق في سنه 2019

بسم الله الرحمن الرحيم

التاريخ----------

المعلومات العامة

1- الاسم: ---------- العمر: -----3 – الجنس :ذكر----انثى------

4-العنوان: المحافظة--------- الناحية--------القرية----------

5-العمل----------ساعات العمل---

6- الحالة الزوجية: أعزب----متزوج----مطلق-----أرمل-----

7- ماهي اللغة التي تتكلم بها-------تقرأ وتكتب بها-------

8- الوزن -----الطول-----مؤشر كتلة الجسم------

9-هل تدخن: كلا---نعم----يوميا----بعض الأحيان----قطعت التدخين----سنة القطع---كم سيكاره تدخن يوميا او كنت تدخن-------كم سنة مضت وانت تدخن---------هل تفكر بقطع التدخين: نعم----كلا----ماهي الموانع----------

الحالة الاقتصادية , المستوى التعليمي والدعم العائلي:

1- هل تقرأ-----هل تكتب------هل تقرأ وتكتب-----
2- آخر مرحلة دراسية أنهيت: الابتدائية----المتوسطة----الإعدادية----معهد-----كلية-----غير متعلم----
3- كم عدد أفراد الاسرة: -----كم عدد غرف النوم في بيتكم-------
4- هل هناك شخص مصاب بداء السكرى يسكن معكم في البيت: نعم----كلا-----
5- هل انت مستقل ماديا: نعم.....كلا
6- هل انت بحاجة الى دعم عائلى و اجتماعي: نعم.....كلا.....
7- من هو الذي يدعمك اقتصاديا واجتماعيا بشكل أساسي (معيل الاسرة) الزوج-----الزوجة-------الاب-----الأم------الأبن-----الأبنة------الأخ------الأخت-----آخرين ----------

8- من هو صاحب القرار: أنا صاحب القرار..... الزوج------الزوجة-------الاب--
---الأم------الابن-----الأبنة-----الأخ------الأخت-----آخرين------

التاريخ المرضى لداء السكر

1-نوع مرض السكرى: نوع 1---نوع 2----سكر الحمل----حالة مقدمات السكرى----
2-متى شخصت لأول مرة بأصابتك بمرض السكرى: السنة----العمر----

3- نوع الأدوية المتناولة ان وجدت مع الجرع:1----------2----------
---3----------4----------5----------6----------

4-هل تتناولها بشكل منتظم: نعم---لا----

5-ماهي الأسباب التي تمنعك من تناولها بشكل منتظم: التأثيرات الجانبية للدواء: نعم---
كلا---سعر الدواء غالي: نعم---كلا----مرض السكري ممكن الشفاء منه وليس خطر:
نعم----كلا---يمكن معالجته بواسطة الأعشاب: نعم---كلا---لا أجد تشجيع من العائلة:
نعم---كلا---دي خوف ان يعتاد جسمي على الدواء: نعم----كلا----الدواء لا يتناسب مع
صيامي: نعم----كلا

6-من يعالج مرضك السكرى: أخصائي أمراض باطنية وسكرى----طبيب عام----ممرض---
آخرين---

7-هل حدث وأصبت بهبوط السكر: كلا---نعم----متى---عدد المرات----ي ساعة في
اليوم----هل أغمي عليك عند هبوط السكر: نعم---كلا----

8-هل اصبت بنوبة تشنج عند هبوط السكر: نعم---كلا----

9-هل أصبت بارتفاع سكر الدم: كلا---نعم----عدد المرات-----هل فقدت الوعي: نعم--
كلا—

10-هل أصبت باي نوع من الالتهاب: كلا-----نعم-----حرقة في الادرار----انفلونزا
متكررة-----حكة في القدمين او الفخذ---قرحة في القدم------

11-هل كان مرض السكرى سببا لدخولك المستشفى لتلقى العلاج في أحد الأيام: كلا---
-نعم------تاريخ الدخول---------أي مستشفى أدخلت----------ما هي المشكلة الطبية
التي كنت تعاني منها----------

اختبار المعرفة عن داء السكري

1-ماذا تعرف عن كيفية ان تعيش نمط حياة صحية:

ا-تناول حصتان من الفاكهة يوميا وخمس حصص من الخضرة بكل أنواعها كل يوم: صح----- خطأ---لا أعرف-----

ب-كل حصة من الخضرة تحتوي على 75 غم من الخضر أي ان الحصة تساوى مثلا ½ كوب من الخضروات الطازجة او ½ كوب من البقوليات المطبوخة، المجففة أو المعلبة (العدس، الفاصوليا، البزاليا) أو نصف كوب من الأذرة الحلوة: صح---خطأ---- --لا أعرف----

ت-تناول الطعام الذي يحتوي على أكثر المكونات صحية بكميات معتدلة وبأوقات منتظمة: صح--- خطأ------لا أعرف-----

ث-عدم التدخين وعدم التعرض الى دخان المدخنين سواء كانوا الأقارب او الأصدقاء: صح-- خطأ---------لا أعرف----

ج-مزاوله الرياضة بشكل منتظم: صح----خطأ-------لا أعرف-----

2-تعريف مرض السكرى هو؛

أ-هو حالة ارتفاع سكر الدم. صح---خطأ-------لا أعرف----

ب-الجسم لا يستطيع ان يفرز كميات كافية من الانسولين. صح---خطأ-----لا أعرف----

ت-الجسم لا يستجيب الى هورمون الانسولين. صح---خطأ-------لا أعرف----

ج-داء السكرى ناتج عن العجز الكلوي. صح----خطأ-------لا أعرف----

خ-هو مرض مزمن يحتاج الى علاج مدى الحياة. صح----خطأ-------لا أعرف----

3-داء السكرى هو:

أ-مدته قصيرة ويمكن الشفاء منه من غير علاج: صح----خطأ--------لا أعرف----

ب-مرض يتطور بشكل تدريجي: صح----خطأ--------لا أعرف----

ت-التداوي بأدوية السكر لفترة قصيرة من الزمن قد تشفي داء السكرى للأبد: صح----خطأ-- -----لا أعرف

ث-مرض يحتاج الى نمط حياة صحية وتناول الادوية التي تعمل على هبوط السكر: صح--- خطأ--لا أعرف----

ج-ربما يحتاج المريض الى حقن الانسولين لغرض تنظيم نسبة السكر في الدم: صح----خطأ-- ------لا أعرف-------

ح-مرض ممكن معالجته باتباع نمط حياة صحية فقط من غير الادوية: صح---خطأ-------لا أعرف---

4- مرض السكري إذا لم يتم معالجته بشكل صحيح يمكن ان يؤدى الى عدة أنواع من المضاعفات التي تتضمن امراض القلب، الكلى، العين والجلطة الدماغية: صح---- خطأ-------لا أعرف----

5- مرض السكرى هو مرض معدي: صح-------خطأ----------لا أعرف----

6-ماهي الاعراض الشائعة لمرض لسكرى:

أ-عدم وضوح الرؤيا: صح---خطأ-------لا أعرف----

ب-العطش المتكرر: صح---- خطأ--------لا أعرف----

ت-جفاف اللسان والفم: صح---خطأ----

ج-الشعور بالتعب، سريع الغضب: صح---خطأ-------لا أعرف----

ح-الشعور بالجوع الدائم رغم تناول الطعام: صح----خطأ-------لا أعرف----

خ-جروح وقروح في الجلد لا تلتئم بسهوله: صح----خطأ--------لا أعرف----

د-ألم وتنميل في أسفل الساقين والقدمين: صح----خطأ--------لا أعرف----

ذ-تغيير في وزن الجسم: صح----خطأ--------لا أعرف----

ر-كل هذه الأعراض المذكورة أعلاه: صح----خطأ--------لا أعرف----

7-ماهي مضاعفات داء السكري؟

أ-العمى: صح----خطأ---- ب-امراض الكلى: صح----خطأ----- ت-امراض القلب: صح---خطأ- ث-امراض الاعصاب: صح----خطأ-

ج-الجلطة الدماغية: صح---خطأ---- ح-فقدان الأطراف: صح----خطأ-----خ- لا يصاب باي مضاعفات تذكر صح----خطأ------- لا أعرف----

8- ربما يظهر مرض داء السكري بأعراضه المتعارف عليها أو يظهر بأحد الامراض الناتجة عن مضاعفاته: صح----خطأ--------لا أعرف----

9-عوامل الخطورة للإصابة بمرض السكري هي:

أ-أصابه أحد أفراد العائلة بمرض السكرى: صح-----خطأ---------لا أعرف----

ب-العيش بنمط حياة غير صحية (التدخين، تناول الأغذية غير الصحية، عدم ممارسه الرياضة): صح-----خطأ--------لا أعرف----

ت-ارتفاع ضغط الدم: صح-----خطأ---------لا أعرف----

ث-زيادة في وزن الجسم: صح-----خطأ---------لا أعرف----

10-أهمية متابعه مستوى السكر بواسطة جهاز قياس السكر في الدم تكمن:

أ-لمعرفه حاله هبوط سكر الدم: صح----خطأ--------لا أعرف----

ب-لمعرفه حاله ارتفاع سكر الدم: صح----خطأ--------لا أعرف----

ت-لمعرفه إذا كان داء السكرى غير منضبط: صح-----خطأ---------لا أعرف----

ث-يعطى رد فعل فورى حول تأثير الدواء المتناول: صح-----خطأ--------لا أعرف----

ج-يعطى رد فعل فورى حول تاثير بعض أنواع الأطعمة: صح--خطأ------لا أعرف----

11-ماهي أعراض هبوط السكر:

أ-الرعشة والخوف: صح---خطأ---لا أعرف---- ب-تعرق وخفقان: صح--خطأ--لا أعرف--

ت-أغماء: صح-----خطأ----لا أعرف----

ث-تشنج: صح-----خطأ----لا أعرف----

12- التأثيرات الجانبية لأدويه مرض السكرى هي:

أ-هبوط مستوى السكر في الدم: صح-----خطأ-----لا اعرف----

ب- اضطراب في المعدة: صح-----خطأ----لا أعرف----

ت-تغير في وزن الجسم: صح----خطأ------لا أعرف----

13- هل تستطيع التمييز بين الغذاء ذو النسبة العالية من الكربوهيدرات والدهون أو ذو النسبة القليلة منه؟ كلا---نعم---إذا كان الجواب بنعم كيف؟ بواسطة ملصق المؤشرات الصحية المتواجد على اغلفه الأغذية! نعم---كلا---البحث عنه في الانترنت! نعم---كلا---بواسطة إرشادات العائلة والأصدقاء! نعم---كلا---إرشادات الطبيب المشرف! نعم---كلا---من خلال دوره ثقافيه! نعم---كلا---بواسطة أخصائي التغذية! نعم--كلا-- ---لا أعرف----

14- الالتزام بالنظام الغذائي الصحي مهم في السيطرة على مستوى السكر في الدم ومن ثم منع ظهور الأعراض والمضاعفات! صح-----خطأ--------لا أعرف----

15-دور ممارسه الرياضة المنظمة مهم في تنظيم نسبه السكر في الدم ومنع حدوث المضاعفات! صح-----خطأ--------لا أعرف----

16-التدخين هو عامل خطورة الى: ا-مرض السكري: صح----خطأ----- ب- أمراض القلب: صح-----خطأ----- ت-كلاهما: صح----خطأ------لا أعرف----

17--يجب فحص العين بعد تشخيص الإصابة بمرض السكري بواسطة طبيب عيون مختص! صح-----خطأ--------لا أعرف----

18-الاعتناء بالقدمين في حاله الإصابة بمرض السكري تكون بهذه الكيفية!

أ-فحص القدمين يوميا لمعرفه إذا كان هناك جروح أو قروح أو التهاب: صح---خطأ---لا أعرف----

ب-مراجعه الطبيب عند ظهور اللون الأسود على الجرح الذي قد يعني أصابته بالكانغرين التي قد تنتهي ببتر الأصبع، الساق، القدم: صح-----خطأ----لا أعرف----

ت-من المهم ان يكون لديك حذاء وجوارب خاصه لمرضى السكرى: صح---خطأ---لا أعرف----

19- ماهي مصادر معلوماتك؟ أ- الطبيب العام---ب-الطبيب الأخصائي -----ت-الصيدلاني---ث-أخصائي التغذية---الممرض---العائلة والأصدقاء---- الأعلام الإلكتروني---الكتيبات الطبية /المجلات العلمية---عدد المرات التي تزور الجهات المذكورة أعلاه! -----لا أزورهم---مره في السنة-----مرتين في السنة---بصوره متكررة في السنة-----

بعد تشخصيك بمرض السكرى(الاتجاه الفكري و الممارسات):

1-هل حاولت ان تثقف نفسك حول مرض السكرى؟ نعم----- كلا------

2-هل حدث أن حضرت دوره منظمه بخصوص مرض السكري؟ نعم----- كلا-----

3-هل تعرف كيف تستخدم جهاز فحص مستوى السكر في الدم؟ كلا----- نعم----- كم مره تستخدمه في اليوم------قبل الأكل------بعد الأكل-----

4-هل تتبع قراءات جهاز فحص مستوى السكر في الدم لتنظيم نسبه السكر في الدم؟ نعم---- كلا----

5-هل تملك جهاز قياس الضغط؟ نعم-----كم مره تقيس ضغط الدم في الأسبوع ----في الشهر----في السنة---- كلا لا أملك جهاز قياس الضغط----لماذا؟ سعره غالى-----لا أعرف كيف أستخدمه-----لا اعرف أنه مهم----اقيس الضغط عند الطبيب/ المستشفى/ المركز الصحي------

6-كيف تعتني بنفسك في أيام المرض؟

أ-في حاله هبوط السكر! تناول مشروب أو طعام سكري! نعم----كلا----أيقاف تناول الأدوية الخاصة بالسكرى مؤقتا! نعم-----كلا----زيارة الطبيب/ المركز الصحي/ المستشفى! نعم----كلا----

ب-في حاله ارتفاع نسبه السكر في الدم! تجنب المشروبات أو الطعام السكري! نعم----- كلا-----زيادة جرعه أدويه السكر مؤقتا! نعم-----كلا----زيارة الطبيب/ المركز الصحي! نعم-----كلا----

7-هل تعرف كيف تغير جرع الأدوية استجابة الى تغيير الغذاء والنشاطات اليومية؟ نعم---- كلا-----

8-هل حاولت ان تنظم وزنك؟ كلا----نعم-----

9-كيف حاولت تقليل وزنك؟ تقليل تناول السعرات الحرارية: نعم-----كلا----مزاوله التمارين الرياضية: نعم-----كلا--تناول الأعشاب الطبية: نعم-----كلا---- استشاره الطبيب: نعم-----كلا-----

10-عندما لاحظت اعراض مرض السكري أو مضاعفاته هل حاولت ان تراجع طبيبك؟ حالا----بعد شهر-----بعد سنه-----لم تراجع لحد هذه اللحظة----- السبب في تأخر مراجعتك هو: عدم القدرة المالية-----صعوبة المواصلات والنقل----لا أملك القرار----- التخوف من الطبيب------

11-هل تزاول الرياضة بشكل منتظم؟ كلا----نعم----عدد المرات في الأسبوع----مده الرياضة---- وقت الرياضة----نوع الرياضة----هل أصبت بهبوط السكر مع مزاوله الرياضة؟ كلا----نعم------

12-هل تعتبر طريقه غذائك صحية؟ نعم----كلا----كم حصة من الخضروات تتناول يوميا----------كم حصة من الفواكه تتناول يوميا----------هل تتناول خبز الشعير: نعم-----كلا---

13- تتجنب الطعام الذي يحوي على نسبه عالية من الدهون؟ كلا-----نعم----

14- تتجنب الطعام الذي يحوي على نسبه عالية من الكربوهيدرات والسكريات؟ نعم---كلا-----

15-هل تعد نسبه الكربوهيدرات والسعرات الحرارية في غذائك؟ نعم----كلا-----هل تستطيع ان تميز مختلف أنواع الدهون؟ نعم-----كلا---

16-هل لديك بدائل أخرى لعلاج مرض السكري غير استخدام النمط الصحي، مزاوله الرياضة أو الأدوية؟ نعم----كلا----

17-هل تعالج مرضك عند معالج تقليدي؟ كلا---نعم---عمله----

18-هل عائلتك تساندك اجتماعيا واقتصاديا في احتياجات علاجك للسكر؟ كلا----نعم---هل تساعدك في تحضير الطعام الخاص بمرض السكر؟ كلا----نعم------تشجعك على مزاوله الرياضة! كلا ---نعم---تشجعك على ترك التدخين! كلا----نعم----تشجعك على ترك المشروبات الروحية! كلا---نعم--

19-هل حالتك الاقتصادية تساعدك على: شراء طعام ذو مؤشرات قليله من السكريات، الكربوهيدرات والدهون (الخضروات، الفواكه، خبز شعير، سمك، دجاج)؟ نعم----كلا-----

20-هل تم فحص شبكيه عينيك بواسطة طبيب عيون أخصائي بعد تشخيص أصابتك بمرض السكري؟ كلا-----نعم--- متى تم الفحص: مباشرة-----ضمن خمس سنوات من بداية التشخيص-----ضمن عشر سنوات.....

21-هل تعتني بصحه قدميك ؟ نعم.....كلا.....

22-ما هو باعتقادك سبب اصابتك بمرض السكر؟ وراثة---------- صدمة نفسيه.....عوامل نفسية----------

23-كيف تشعر وانت مصاب بداء السكر؟ باكتئاب-------قلق----------حزن--------
---غير مكترث----------

24-هل اثرت اصابتك بداء السكرى على حياتك اليوميه؟كلا .....نعم.....أحيانا-
.....

25-ماهوالتأثير-------- قلة في النشاطات اليوميه والاجتماعيه ....., الشعور بالالم الجسدي..... لشعور بالتعب والأعياء.....كثرة الادرار.....تشوش الرؤيا.....العجز الجنسي.....

26-هل اثرت اصابتك بداء السكر على مزاولة عملك؟------كلا---------نعم---------
اضطررت للتقاعد---------- اضطررت لترك العمل-----اضطرت لتقليل ساعات العمل------حدث لي أرباك في العمل----------

27 -ماهي النتائج النهائية للتحاليل الأتية:

1- Hb A1c% (فحص السكر التراكمي) ----------تاريخ الفحص: ------لا أعرف---
2- RBG (فحص السكر العشوائي) ----------تاريخ الفحص: ---لا أعرف----
3- Fasting blood glucose (فحص السكر بعد الصيام) ---------- تاريخ الفحص: --- لا أعرف----
4- Fasting lipid profile (فحص الدهون بعد الصيام) ----------
---------- تاريخ الفحص:---------- ---لا أعرف----
5- Retinal screening (فحص شبكية العين) ---------- تاريخ الفحص: ---لا أعرف---

تمت بعون الله

شكرا لمساعدتكم في أملاء هذه الاستمارة.

الخلاصة

الخلفية: مرض السكري الثاني هو مرض مزمن غير معدي وشائع و حسب منظمة الصحة العالميه لسنة 2020 حيث أن هناك 1.5 مليون شخص توفوا بسبب هذا المرض فقط.نسبة الأنتشار في أزدياد في العراق بشكل كبير حيث تتراوح معدل نسبة الانتشار من 8.5% الى 13.9%. تقريبا 1.4 مليون عراقي يعاني مرض السكري.(Kharroubi, A, 2015) , لهذا كان ضروريا أجراء دراسة لأختبار سؤال الباحث الذي يعتقد بأن مرضى السكرى نوع الثاني في محافظة كربلاء المقدسه لا يوجد لديهم معلومات كافيه بما يتعلق العلاجات الدوائية لهذا المرض وأعتبر هذا السؤال متغير مستقل الذي قد يؤثر بشكل سلبي على مفهوم وممارسا ت هؤلاء المرضى في هذا المجال والذى أعتبر متغير غير مستقل في هذه الدراسة. كذلك لتقييم المعلومات الأساسيه,المفهوم والممارسات لمرضى السكرى نوع ثاني فيما يتعلق بالعلاجات غير الدوائيه لهذا المرض. وكذلك لدراسة العلاقه مابين معدل المعرفه, المفهوم والممارسات ومعدل السكر التراكمي, معدل كتلة الجسم , مدة المرض و بعض الخصائص الديموغرافيه الاجتماعية. العلاج غير الدوائي بالأساس هو تغيير نمط الحياة غير الصحي من خلال عدة اوجه أكثرها شهرة هو الاعتناء بالغذاء الصحي والاهتمام بالنشاط البدني بينما الوجه الآخر لها زيادة مهارة الفرد الصحية من خلال التثقيف حول المفهوم الأساس حول المرض السكرى نوع الثاني وكيفية تجنب حدوث المضاعفات .

الهدف: تهدف هذه الدراسه الى أنشاء مؤسسات او برامج صحيه تداخليه بما يخص العلاجات الدوائيه لمرض السكري نوع الثاني في كربلاء في المستقبل ومن ثم دراسة مدى نجاح تأثيرها.

النتيجه : متوسط العمر هو 55.19± 9.99 ,46.5% نساء, 53..5% رجال ,77.5% من المرضى يعلمون أن مرض السكري الثاني هو أرتفاع نسبة السكر في الدم. 39.0.% منهم يعلمون أنه مرض مزمن ويحتاج الى علاج مدى الحياة, 41.0%منهم لايعلمون هل ممكن الشفاء منه بدون علاج.58.5% منهم يعلمون انه مرض يتطور مع الوقت.36.5% يعلمون أن تغيير نمط الحياة الى حياة صحية مع أدوية السكري هو ضروري لعلاج مرض السكر.

منهم يعلمون ان أعراض مرض السكري هي تشوش الرؤيا,جفاف الفم وكثرة الادرار ,76.5% 85.5 % , 60.5 % منهم يعرفون أن أعتلال شبكيه العين و أعتلال الكليه بالتسلسل هي من مضعفات المرض. .

19.5 %, 27.5 % يعرفون أن نمط الحياة غير الصحي و السمنه بالتسلسل هي عوامل خطورة. كما أن مرض السكري النوع الثاني يؤثر على الحياة اليومية بنسبة 79.5% و يمكن ان يسبب تأثيرات نفسية متعددة بنسبة 47.5%وله عواقب سلبية على ممارسة العمل بنسبة 53.5%.

هو معدل السكر التراكمي. 10.52 ±2.33 SD ,مؤشر كتلة الجسم يتراوح مابين 18.13-48.89 kg\m², 30.72 ± 5.05SD هومعدل كتلة الجسم حيث يبدوا واضحا أن السمنة شائعة بين المرضى.

النتيجه لدرجة المعلومات, المفاهيم, و الممارسات لمرضى السكري النوع الثاني في العينه الدراسية هي بالتسلسل 39.9% ,48.2%, 44.1% .

ايضا أن علاقة بيرسون الاحصائية مابين المعرفه و العوامل الخارجيه مثل العمر, مستوى التعليم, الحالة الاقتصاديه,, مؤشر الازدحام والعمل هي علاقه طردية اي ايجابية عندما تكون قيمه ب االلأحصائية معتبرة. أن علاقة بيرسون الاحصائية مابين نسبة معدل المعرفه و معدل مؤشر كتلة الجسم ومعدل تحليل السكر التراكمي هي كالاتي بالتسلسل 0.297 ,0.246- ,0.212 - عندما تكون قيمه ب الاحصائية معتبرة.

ان علاقة بيرسون الاحصائية بين معدل المعرفه ومعدل الممارسات الايجابية ومابين معدل المعرفه ومعدل المفاهيم الايجابيه وكذلك مابين معدل الممارسات الايجابية و معدل المفاهيم الايجابيه هي نتائج ايجابية وطرديه 0.9 ولكن قيمة ب الاحصائيه ليست معتبرة.

الاستنتاج : كشفت الدراسة بان المرضى الذين يعانون من مرض السكري النوع الثاني في كربلاء لا يملكون المعلومات الكافية عنه و عن كيفية اداء ممارساتهم وسلوكهم الصحي المفترض اتباعه تجاه هذا المرض بعد اصابتهم به .

كما ان التحليل الأحصائ استخلص أن زيادة المعرفة بمرض السكري الثاني سوف يحسن من مستوى تحليل السكر التراكمي وكذلك مؤشر كتلة الجسم.

التوصيات : نتائج هذه الدراسة تؤكد على ضرورة انشاء مركز لتثقيف مرضى داء السكري النوع الثاني وكذلك تثقيف عوائلهم بخصوص هذا المرض بالإضافة الى زيادة كفاءة وحدة امراض السكري المتواجدة حالياً والحاجه الى مركز رابطة المرضى بداء السكري للاهتمام بهم من كل الجوانب.

تقييم مرض داء السكري نوع الثاني حول المعلومات, ألمفاهيم و الممارسات بخصوص العلاجات غير الدوائية لمرضى داء السكري الثاني في كربلاء المقدسة /2019

رسالة مقدمة الى مجلس كلية الطب – جامعة كربلاء

كجزء من متطلبات نيل شهادة الدبلوم العالي في طب الاسرة و المجتمع من قبل

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