# Type 2 Diabetes Mellitus Risk Factors among Saudis Patients at Mohail Asser Hospital

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**Abstract: An Introduction**: Risk factor administration is significant in keeping away from life-threatening a difficulty and preventing new-onset of diabetes, throughout identified and counselee the high risk groups before suffering from diabetes. The prevalence of type 2 diabetes mellitus is steadily elevating in Saudi Arabia may be due to people growth, aging, development, elevating occurrence of obesity and physical dormancy. Screening must be previously detection and or additional heavy therapy of persons with asymptomatic will be resulting in improved clinical outcomes. **Aims** were to: Assess the risk factors for type 2 diabetes, determine which risk can be managed and estimate the probability of type 2 diabetes occurrence in study subjects. **Research design:** A cross sectional design was followed. **Subjects and sitting:** 150 patients from Mohail Asser Hospital were randomly selected. **Tool of data collection:** a structured questionnaire sheet of a German Diabetes Risk Score was adopted. **Results:** The result of our study reveals that there were high risk factors among participant regarding type 2 DM. the highest risk factors were obesity, consumption of meat, coffee, whole grain bread, physical inactivity, hypertension as well as family history. There was a high risk among participant to suffer from type 2DM in the next 5 years. Based on these result we recommended that improve community alertness regarding type 2 DM modifiable risk factors must be conducted by, audiovisuals media e.g. an illustrated pamphlet, videos, and healthy day workshop, and a mass screening for early detection and take actions from person and governorate must be conduct.

## 1. Introduction:

Diabetes mellitus (DM) is a group of diseases marked by high levels of blood glucose, resulting from defects in insulin production, insulin action, or both. DM is one of the most challenging healthcare problems with great medical and financial burden worldwide. Globally, diabetes leads to one death every 6 seconds and attributes for 8.4% of all global mortality. Diabetes caused 5.1 million deaths in 2013. Without aforethought action to prohibit diabetes, in fewer than 25 years' there will be 592 million people live with the disease and 46% were undiagnosed. Maximum of those issues would be preventable[1]. Research has attributed this elevate in the burden of DM to peoples growth, environmental and genetic factors, and also growing civilization, increasing prevalence of obesity and physical inactivity[2-3].

Saudi Arabia, Kuwait, and Qatar, are the three Arabic-speaking countries with the highest prevalence of type 2 DM[1] Diabetes is a dangerous generally health trouble in Saudi Arabia, as approximately one out of five Saudis isdiabetic[4]. There is a tremendous increase in lifestyle related diseases in Saudi Arabia such as DM, hypertension, obesity, cardiovascular and kidney[5]. A variable style of lifestyle between the Saudi peoples in the direction of civilization and dieting habits e.g. consumption of high energy from high-fat diets and fewer levels of physical activity lead to alterations in energy equilibrium with the preservation of energy stored as fat. Like excess energy consumption per second elevates insulin resistance even previously considerable weight gain happens[6]. The world health organization (WHO) projects a 3-fold great in the number of people with DM from 890,000 in 2000 to 2,523,000 in 2030 in Saudi Arabia[7].

Kingdom of Saudi Arabia (KSA) is one of the top increasing economies of the world and it has happened alterations in the lifestyle of people. Dietary habits are harmful to health and the level of body activity is very low. Thus obesity is dramatically growing analogous with its rival diabetes [8]. The actual burden because of diabetes is likely to exceed the $0.87 billion in KSA. Plus the indirect costs associated with diabetes, such as absenteeism, lost productivity from disease related absenteeism, unemployment from disease related disability, lost productivity due to early mortality by disease[9].

Utilizing data typically collected through public practice visits, like smoking history, BMI, family history and utilize of medications lowering blood pressure, a diabetes danger score was predict a patient's risk. By using available tools, physicians and other health care practitioners can promote healthy lifestyle involvements that may be lowering the danger of diabetes [10-11].

Type 2 diabetes is the most common form of diabetes. In patients with type 2 diabetes, either the body does not produce enough insulin or the cells ignore the insulin[12]. Type 2 diabetes reported that about 95% of all situations diagnosed in adults. More research has observed that the healthy dietary, regular body activity, and weight loss utilized with medication if specifically, can assist observation complications from type 2 diabetes or can prohibit or delay the beginning of type 2 diabetes among people at ris[13]. Many people with type 2 diabetes remain unaware of their illness for a long time because symptoms may take years to appear or be recognized. They are often diagnosed only when complications of diabetes have already developed[14].

Family history data may be avail as a beneficial tool for common health may be caused it be inverted both genetic and environmental agents like a family history of DM may be a worthy process for differentiating patients at danger for diabetes. Moreover, learning of family history may be lead to differentiate human at elevated danger and encourage them to make preventive lifestyle alterations that could with approval influence both clinical practice and patient behavior[15]. To observation DM, it is achieved to limit the connected danger agents, and take steps to administer these danger agents to prevent or delay the onset of type 2DM and also keep away from the appearances of life-threatening complications. Regardless of this a great ratio of patients with danger agents for diabetes-concerning complications are not enough controlled[16].

It is well recognized that there are several agents influence the willingness of DM. like lifestyle, diet habits, physical activity, and obesity. In recent times in Saudi Arabia, food size of portions and options have excesses dramatically, in additional the sedentary lifestyle comes to the greatest danger of obesity that adds to the frightening diabetes statistics[17]. The propagation of DM in the general Saudi peoples was 30%[18]. The rise intake of fast foods and sugar-heavy beverages, in additional the comprehensive, utilize of cars, elevators, escalators; remotes in recent years have dramatically greater the especially a heavy one of obesity in KSA. The propagation of obesity among diabetics and hypertensive patients was 46% and 54%, respectively[19]. Lifestyle involvement that outcome in weight loss and excessive body activity can prevent or delay kind 2 DM and in some issues return blood glucose levels [20].

American Diabetes Association's (ADA) recommends testing for any asymptomatic adults who are obese and more additional for DM, and abnormal cholesterol and also, the ADA recommended that the age of 45 year, repeat testing considered every 3 years thereafterr[21]. Examination standard should involve the strongest danger agents for promoting diabetes, which could be identified as much people with undiagnosed diabetes as potential. Examining for type 2 DM begin at age 30 or 45 and repeated every 3 to 5 years leads to diagnose earlier than examining based only on high blood pressure and it is cost effective[22-23]. Multivariate risk scores have been developed in recent years to predict diabetes risk for healthy individuals, and such risk scores are recommended in current practice guidelines for diabetes prevention[24]. Screening asymptomatic adult for DM may be able to lead to previously detection and earlier or additional intensive therapy of persons, furthermore, resulting in improved clinical outcomes (35-36). Strategies for examining involved routine examining targeted examining related to finding of danger agents or utilizing danger estimate instruments. For persons with normal initial screening tests, National Guidelines recommend rescreening every 3 years[25]. The Canadian Task Force recommends rescreening either annually or every 3 to 5 years depending on risk level[26].

The plurality of available danger estimate tools includes simple questionnaires around diabetes danger agents. A degree is allocated for each danger agent and the total degree utilized to identify individuals for laboratory screening[27]. There are different evaluates for an estimate the danger of having undiagnosed diabetes, few evaluates are obtainable for estimating the future potential of improving diabetes, projecting future propagation of diabetes is a beneficial process to evaluate the burden of diabetes[28].

The United States Preventive Services Task Force (USPSTF) presently recommends examining for type 2 DM in asymptomatic adults with high blood pressure. Various diabetes danger degree has been advanced in various countries prepared to identify individuals at elevated danger of improving DM and those pain from undiagnosed DM[29].

The German diabetes organization recommends the implementation of the German Diabetes Risk Score (GDRS) to exam for undiagnosed personal that become early to determine high-risk groups. GDRS was developed by the German Institute of Human Nutrition and enables the calculation of the 5-year risk for developing type 2 DM. Now, it was extended with the inclusion of family history information and with modifications regarding dietary risk factors (e.g. whole-grain cereals) and, with regard to experiences from the application, the GDRS was further improved in terms of practicability[30]. GDRS is an accurate screening tool for undiagnosed diabetes and intermediate hyperglycemia[31]. A significant strategy for have a try the diabetes burden is to exam for undiagnosed diabetes and for the at a later time danger of improvement diabetes. DRS is a cheap and simple way of estimating an individual's ganger of having

undiagnosed diabetes and their danger of at a later time diabetes[1].

Examining is absolutely necessary for alerting people to the dangers they face. Millions don't inform they already have type 2 DM or are at rising danger of improving the disease. Around 25% of people with diabetes are undiagnosed. It is evaluated 90% or more of people with pre-diabetes are insensible of their condition. Pre-diabetes usually advances to type 2 DM within 7-10 years 33. Pre-diabetes is a condition in which individuals have elevated blood glucose or hemoglobin A1C levels but not great sufficient to be classified as diabetes[34].

Dominating and therapy to type 2 DM and its complications demand long-term designing and based on the distribution of resources-particularly in improving countries with fixed resources. Subsequently, predicting the future burden of DM potentially supplies invaluable tool for common health designers. Research which predicting the future propagation of DM in improving countries are very rare[1]. Targeted examining can differentiate high blood glucose levels that signal undiagnosed diabetes. With this data, patients and providers can occupy protective action or start therapy to assistance save lives. Examining can also differentiate adults who have DM but don't inform, to allow for earlier involvement that can assist prevent or delay the subversive and costly complications of diabetes [35].

Risk factor administration is significant to keeping away from life-threatening complications and prohibition new-onset DM. Comprehensive, pre-diabetic and elevate danger groups may be specified and give advice to early previously the appearance of DM. Young adults may also be known that regeneration, limited body activity, and, thus, obesity is causing showed of diabetes[36]. Type 2DM is presently a great public health challenge in Saudi Arabia and its load will grow a significant extent in the next decade. Decreasing the levels of danger agents, especially obesity and smoking, can outcome in a lowering of the disease propagation, thus may be an urgent action[37]. There is a need for urgent programs aiming at encouraging people to learn about risks and warning signs of DM, to take actions to prevent the disease and seek healthcare in case they develop DM. Diagnosis of diabetes is responsibility both of personal and health system and services. Diabetes risk measurement must be incorporated into primary health care with general health Coverage[38].

## 2. Subject & Methods:

**2.1. Aims** of this research: The research was targeted to

**1.** Assess the risk factors for type 2 diabetes in study subjects.

**2.** Determine which risk can be managed.

**3.** Estimate the probability of type 2 diabetes occurrence in study subjects.

## 2.2. Design:

A cross sectional design was planned to determine the risk factors of type 2 diabetes mellitus among the female patients in Mohail Asser Hospital, Kingdome Saudi Arabia.

## 2.3. Subject & Setting:

The study was conducted during the months of October to December 2017. A random sample of 150 females patients were selected age over 30 years, from inpatient Medical-Surgical department, Mohail Asser Hospital. The study included only female Saudi nationality, hasn't suffered from diabetes mellitus before, and have normal level of consciousness.

## 2.4. Tool of Data Collection:

Results were collected during a face-to-face meeting using a structured questionnaire sheet of a German Diabetes Risk Score, that was developed by the German Institute of Human Nutrition and enables the calculation of the 5-year risk for developing type 2 diabetes[30]. The participants were informed about objectives of the study and given instructions to recall all information truthfully and verbal consents were obtained.

A questionnaire sheet included 11closed end questions related to type 2 DM. risk factors covered Pt. age, physical activity, history of hypertension, consumption of whole grain bread, consumption of meat, coffee drinking, history of smoking, height in centimeters, waist circumference in centimeters, family history to type 2 diabetes and if her relatives been diagnosed with type 2 diabetes in addition to measuring fasting blood sugar. Determine the subject diabetes risk by calculating GDRS points & in accordance to fasting blood sugar.

Subject who had FBS <100mg/dl, DRS point <46 was low, 46-56 was still low, 57-63 was elevated and >63 was high to very high risk factors, while who had FBS >100 to 125mg/dl, DRS point <46 was still low, 46-56 was elevated, 57-63 was high to very high and >63 was high to very high risk factors.

## 2.5. Procedure:

A structured face to face interview with participants separately was conducted, they were asked to recall history of smoking; all physical activities they had performed weekly before hospital admission, family history to DM, consumption of whole bread, coffee and meat. After the meeting with the participants, anthropometric screenings were carried out, containing height, weight, waist circumference utilizing limited methods and standardize tools are to the nearest 0.1 cm. The Body Mass Index was calculated as personal weight in kilograms divided by the height in meters squared.

The study participants were asked to fast overnight from 12 o'clock until morning to measuring fasting blood sugar through peripheral blood sample by finger puncture for each participant using Accu-Check portable glucometer. Subjects were asked if they informed by a doctor that have high blood pressure, then measuring Bp. using an electronic sphygmomanometer. After collecting total risk scores, the subjects were informed individually about their risk factors and advised accordingly.

The forward/backward translation protocol for the transformation of estimated instruments was utilized to translate the questionnaire into Arabic form in order to facilitate data collocation. The backward translated document was forwarded to a board of experts to discover any poorly translated items and clarity. It takes 20 minute to fill and measures BP, height and FBS.

**2.6. Ethical Consideration:**

Official approvals were obtained from the ethical committee of the king Khalid University, and from the vice dean of applied medical sciences college as well as from Mohail Asser hospital administrative after submit the research title, aims and tools to collect the relevant data. Confidentiality of the data and anonymity were maintained.

**2.7. Statistical analysis**

Results have come to the statistical package for social sciences (SPSS, version 18.0). Descriptive statistics for socio-demographic data were recorded and analytic statistics (Frequency, percentage and Paired T test were applied as required).

**3. Result**

Table 1 describes that nearly half of participants had family income not enough to daily living (47.3%), more than quarter were illiterate, quarter and nearly quarter had secondary and university education (25.3 & 24%) respectively. More than half were married (59.3%), more than third had BMI between 20 to25, and 19.3% had BMI more than 30 and 18.7% had FBS more than 120mg/dl.

Table 2 indicates that more than third of participants were consumption read meat 5 to 6 per day and nearly quarter daily (34, 24.7% respectively), nearly third consumption whole bread 3time a day and more quarter 4 time a day, more than third consumption coffee either one per day or more than 5time per day (38 and 36% respectively), majority of them hadn't perform physical exercise (78%) and 45% were suffer from hypertension. Also, table shows that 45% had high more than 160cm, 45.3% had waist circumference between 100 to 120cm and 8.7 more than 120cm., 10% of their both parents were diabetic and 14,7% had only one parent were diabetic, and 26% had at least one of your siblings been diagnosed with type 2 diabetes**.**

**Table (1): Demographic Characteristics of Study Participants (No= 150)**

|  | Items | Frequency | Percent |
|---|---|---|---|
| Family income | Not enough | 71 | 47.3 |
|  | enough | 61 | 40.7 |
|  | enough and safe | 18 | 12.0 |
| Level of education | uneducated | 42 | 28.0 |
|  | primary | 34 | 22.7 |
|  | secondary | 38 | 25.3 |
|  | university | 36 | 24.0 |
| Marital state | married | 89 | 59.3 |
|  | unmarried | 61 | 40.7 |
| Weight | <50 | 36 | 24.0 |
|  | 50-59 | 35 | 23.3 |
|  | 60-69 | 41 | 27.3 |
|  | 70-79 | 38 | 25.3 |
| BMI | <25 | 45 | 30.0 |
|  | 25-29 | 57 | 38.0 |
|  | 30-34 | 19 | 12.7 |
|  | >35 | 29 | 19.3 |
| FBS | <120 | 122 | 81.3 |
|  | >120 | 28 | 18.7 |

Figure 2 demonstrates that 60% of study participants had low risk scores for type 2 diabetes, 28% had elevated risk and 19% had high risk. Table 3 illustrates that their statistical significant difference between participants total type 2 diabetes risk scores

and deferential risk factors as well as with their demographic characteristics (P value <0.05).

## 4. Discussion

International Diabetes Federation reported that 415 million adults have diabetes in the world and this by 2040 maybe increase to 642 million. Saudi Arabia has been classified as having the second greatest average of diabetes in the Middle East and the seventh greatest propagation of diabetes in the world[39]. T2D prevalence at Saudi Arabia reflects the increasing globally; an estimated 40.3% of cases are unaware of their condition. On the other hand, 25.5% of Saudi peoples over the age of 30 showing signs of pre-diabetes and 28.7% classified as obese and later at danger of T2D, the number of people with T2D is predictable to increase considerably by 2035, the number of patient with diabetes old man among 20 and 79 years old is evaluated to range 7.5 million[40].

Regarding participants characteristic all participants were female, there was constrains to deals with a mal personnel at KSA. a mass survey must be conducting including both male and female personnel that may be indicates more prevalence total risk score in related to smoking and alcohol consumption, the finding of this research revealed that nearly half had family income not enough to daily living and only 12% had enough and safe, more than quarter uneducated and nearly quarter had university graduation, more than half were married. Regarding body mass index, the finding indicates that 19.3% had BMI over 35 & 12.7 % between 30 - 34, the result were constant with a study conducted at KSA to estimate the influence of obesity on diabetes and high blood pressure were found the propagation of obesity between diabetes and high blood pressure patients were 46% and 54%, respectively[41]. On the other hands, 18.7 had fasting blood sugar more than 120mg/dl. This result reflect the percentage of probability of type 2 DM among the participant. Obesity is one of the often absolutely necessary danger agents for type 2 DM, there is a considerable connection between DM and obesity (P < 0.0001). Meanwhile, predominating body weight plays a significant function in the protection and therapy of diabetes [42].
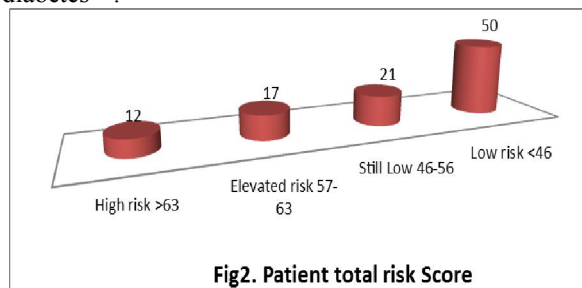


**Fig2. Patient total risk Score**

**Table (2): Percentage Distribution of Participant Type 2 Risk Scores (No = 150)**

| GDR items | | Frequency | Percent |
|---|---|---|---|
| Age: | less35 | 33 | 22.0 |
| | 35-39 | 14 | 9.3 |
| | 40-44 | 20 | 13.3 |
| | 45-49 | 17 | 11.3 |
| | 50-59 | 27 | 18.0 |
| | 60-65 | 18 | 12.0 |
| | >65 | 21 | 14.0 |
| **Waist in centimeters**. | 74 | 2 | 1.3 |
| | 75-79 | 5 | 3.3 |
| | 80-84 | 8 | 5.3 |
| | 85-89 | 30 | 20.0 |
| | 90-94 | 14 | 9.3 |
| | 95=99 | 10 | 6.7 |
| | 100-104 | 14 | 9.3 |
| | 105-109 | 29 | 19.3 |
| | 110-114 | 18 | 12.0 |
| | 115-120 | 7 | 4.7 |
| | >120 | 13 | 8.7 |
| **Consumption of meat** | NEVER | 21 | 14.0 |
| | 1-2 TIMES | 34 | 22.7 |
| | 3-4 | 5 | 3.3 |
| | 5-6 | 51 | 34.0 |
| | daily | 37 | 24.7 |
| | several a day | 2 | 1.3 |
| **Consumption of whole grain bread** | 1 TIMES | 11 | 7.3 |
| | 2 TIMES | 19 | 12.7 |
| | 3 | 48 | 32.0 |
| | 4 | 43 | 28.7 |
| | >5 | 29 | 19.3 |
| **Consumption of coffee** | 0-1 | 57 | 38.0 |
| | 2-5 | 39 | 26.0 |
| | >5 | 54 | 36.0 |
| **Physical activity** | no | 117 | 78.0 |
| | yes | 33 | 22.0 |
| **have high** BP | no | 82 | 54.7 |
| | yes | 68 | 45.3 |
| **Height in Centimeters** | <152 CM | 48 | 32.0 |
| | 152-159 | 34 | 22.7 |
| | 160-167 | 18 | 12.0 |
| | 168-175 | 23 | 15.3 |
| | 176-183 | 27 | 18.0 |
| **Diabetes in the family** | no | 113 | 75.3 |
| | one parent | 22 | 14.7 |
| | both parents | 15 | 10.0 |
| Have at least one of your siblings been diagnosed with type2 diabetes? | no | 110 | 73.3 |
| | yes | 40 | 26.7 |

**Table 3: Correlation of Total Risk Score of Type 2 Diabetes with Each Risk Factors among Participants (No=150)**

| Items | Paired Differences | | | | | t | df | Sig. (2- tailed) |
|---|---|---|---|---|---|---|---|---|
| | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | Lower | Upper | | | |
| Age / DRS | .87333 | 3.22386 | .26323 | .35319 | 1.39347 | 3.318 | 149 | .001 |
| Waist circum. /DRS | 5.71333 | 8.95128 | .73087 | 4.26913 | 7.15754 | 7.817 | 149 | .000 |
| Red meat/DRS | 2.14667 | 2.09309 | .17090 | 1.80897 | 2.48437 | 12.561 | 149 | .000 |
| Whole grain/DRS | 1.40000 | 1.80231 | .14716 | 1.10921 | 1.69079 | 9.514 | 149 | .000 |
| Coffee/ DRS | -.76000- | 1.19102 | .09725 | -.95216- | -.56784- | -7.815- | 149 | .000 |
| BP./DRS | .64000 | 2.38080 | .19439 | .25588 | 1.02412 | 3.292 | 149 | .001 |
| Physical activity/DRS | -1.42000E0 | .99171 | .08097 | -1.58000- | -1.26000- | -17.537- | 149 | .000 |
| FBG/DRS | -.36667- | 1.16098 | .09479 | -.55398- | -.17935- | -3.868- | 149 | .000 |
| BMI/ DRS | .56667 | 1.48105 | .12093 | .32771 | .80562 | 4.686 | 149 | .000 |
| Family history/ DRS | -.81333- | 1.05796 | .08638 | -.98403- | -.64264- | -9.416- | 149 | .000 |
| Age & exercise | 2.64000 | 2.16525 | .17679 | 2.29066 | 2.98934 | 14.933 | 149 | .000 |
| Age & BMI | 1.64667 | 2.36909 | .19344 | 1.26434 | 2.02890 | 8.513 | 149 | .000 |
| BP & Read meat | 1.91333 | 1.58405 | .12934 | 1.65776 | 2.16891 | 14.793 | 149 | .000 |
| BP & Coffee | .52667 | .93189 | .07609 | .37632 | .67702 | 6.922 | 149 | .000 |
| FBS & bread | 2.21333 | 1.17916 | .09628 | 2.02309 | 2.40358 | 22.989 | 149 | .000 |
| BP & BMI | -.76000- | 1.12136 | .09156 | -.94092- | -.57908- | -8.301- | 149 | .000 |
| FBS & BMI | -1.02667E0 | 1.19252 | .09737 | -1.21907- | -.83426- | -10.544- | 149 | .000 |
| FBS & Family DM | .16000 | .75155 | .06136 | .03874 | .28126 | 2.607 | 149 | .010 |

Among distribution of participant type 2 risk scores, the finding revealed that 26% of participants were aged over 60 years, and more than quarter aged between 45 to 59 years. In constant with Al Hayek et al., 2014, they found that increasing age was an important risk confirmed with other reports from other sides of Saudi Arabia and near countries[43]. The danger of diabetes raise with the elevation of age, thus with growing body mass index and this was established to be statistically considerable p < 0.0001[44].

The current research indicates that more than half of participants had waist circumference more than 100cm. which increase the susceptibility of participant to type 2 DM, more than third eaten meat 5-6time weekly, nearly quarter daily, that was a risk to increase cholesterol level intern risk also to DM. Regarding consumption of whole grain bread nearly third eaten it 3 time per day, more than quarter 4 time per day and 19.3% more than 4time per day, more than third of them drink coffee more than 5time /day and more than quarter of them drink coffee 2 to 5 time per day. Regarding that, the environmental agents, the decrease of body activity and sedentary lifestyle are starting significant agents that participate in the excesses propagation of obesity in gulf countries. Furthermore, decreasing dieting and lifestyle alteration would reduce the happening of diabetes [45].

Majority of participant in current research didn't perform physical exercise weekly and hadn't family history to DM, while more than quarter had siblings been diagnosed with type 2 diabetes, less than half had history for hypertension, all of this factors were increase participants susceptibility to type 2DM. and illustrate the increased total risk scores. All participant reported that they didn't smoking and didn't

consumption alcohol this may be due to all of them were female and there was a culture constrains regarding this behaviors. Reducing physical activity demonstrates with growing age, the adipose sedimentation may be excesses which might be lead to insulin resistance and elevated averages of blood glucose and hypertension. [46].

Regarding participants total risk scores, the finding reveals that there was a high risk among 12% of participants and elevated risk for 17% and 50% of them had low risk scores. On the other hand, there were a statistical significant differences between participants total risk scores and related risk factors as well as selected risk factors and participants characteristics (P< 0.001), these result were constant with Kiamco (2016), found that the advancement of type 2 diabetes connects to different behavioral, predisposing, and environmental agents and also recommended performed essential protection and secondary protection activity to growing information and cleverness of the customer and their families of how to protect and observation type 2 diabetes during a wellness program in the clinic[47].

Our result were indicates that, there are a statistical significant result between participant total risk scores and their blood pressure, obesity, family history to diabetes fasting blood sugar as well as their age, these result were constant with Amin et.al,2014 that found hypertension is the strongest risk factor associated with DM in Saudi Arabia[48], also with American Diabetes Association mentioned that the danger of improving diabetes excess between sedentary people, suffering from obesity, central overweight, arterial high blood pressure fasting plasma glucose ≥100mg/dl, unsuitable dietary habits, elevate

age, and with a family history of diabetes, which is significant a non-modifiable danger agent[49.] Since hypertension, obesity and family history are well known to contribute to type 2 DM. among the study participants.

Family history of diabetes, obesity, age, marital situation, and cultural degree were advanced agents establish to excess the danger of diabetes. Strategies target to advance a healthy lifestyle is present to decrease the charge of this disease. Family history of diabetes is a popular danger agent of the disease. These results were confirmed by Arab countries [50-51.] from 25 to 33% of all type 2 diabetic patients have family members with diabetes and having a first-degree considered in relation to the disease poses a 40% risk of advancing diabetes[10], this is constant with our result, we found that more than quarter of study participants had siblings been diagnosed with type2 diabetes.

### Conclusion & recommendations:

Increasing personnel alertness concerning modifiable diabetes danger agents, healthy lifestyles, and improving strategies to limit and administer that at danger is able to be done devices to reducing type 2 DM prevalence and the related health problem and complication.

The result of our study reveals that there were high risk factors among participant regarding type 2 DM. the highest risk factors were obesity, consumption of meat, coffee, whole grain bread, physical inactivity, hypertension as well as family history. There was a high risk among participant to suffer from type 2DM in the next 5 years.

Based on these result we recommended that improve community alertness regarding type 2 DM modifiable risk factors must be conducted by, audiovisuals media e.g. an illustrated pamphlet, videos, and healthy day workshop, and a mass screening for early detection and take actions from person and governorate must be conduct.

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