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Factors affecting the occurrence of Type II DM in Nablus City

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Dedication

**With all love to my Husband and my Children
for the care and love they provided me
throughout the study**

**I would like to thank my mother and brother
also for their encouragement and support
through out my study**

owledgments

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Abstract

Type II diabetes has been described to have an epidemic-like spread all over the world with special emphasis on countries experiencing the transition to western lifestyle.

Diabetes Mellitus affects more than 14 million cases In the US. and is the leading cause of new blindness and kidney disease. Diabetes also causes nerve disease, heart disease, and stroke each year At least 19000 people die from diabetes and its complication.

People with higher than average risk Of type II diabetes are those who are over weight and people who are not physically active.

About 317 people over the age of 35 were selected from Nablus community to participate in this study. Study participants were examined for type of work, diet and the extent to which they are involved in physical activity. They were also examined for weight, height fasting blood sugar and blood pressure.

SPSS software was used to provide descriptive and cross-tabulation analysis of collected data, the also relationship between the risk factors to develop type 2 Diabetes Mellitus and one or more of lifestyle patterns was examined ..

Almost all results were consistent with the findings of international literature especially those related to the neighboring countries like Saudi Arabia.

Conclusions of our study confirms that:

prevented as in all other studies about the

subject

- There is a significant relation between lifestyle, diet, and occurrence of Type 2 Diabetes.

- Even though level of general education for study sample was good, knowledge about the disease was very low

- Males demonstrated to be more susceptible for type 2 diabetes than females of the same age group in the sample study.

Glossary

- B.M.I: Body Mass Index

- NIDDM: Non Insulin Dependant Diabetes Mellitus

- IDDM :   Insulin Dependant Diabetes Mellitus

- F.B.S: Fasting Blood Sugar.

- IGT :   Impaired Glucose Tolerance

- MODY: Maturity Onset Diabetes in young.

- WHO: World Health Organization.

1.1 Definition of disease:

Diabetes Mellitus is a complex, heterogeneous, metabolic disease, characterized by high blood glucose concentrations (West KM.1978). This elevation of blood glucose concentration is thought to result from reduction in insulin secretion in the pancreas, or reduced sensitivity to insulin in the peripheral tissue (West Lund 1972).

Diabetes Mellitus causes a major public health challenge for all countries of the world. The disease prevalence and incidence is steadily increasing and new cases are detected in developing countries. The current pattern of occurrence suggests an epidemic-like spread of the disease. With this pattern it is expected that number of individuals affected by diabetes will more than double, from 140 million to 300 million in the next 25 years. (Kamal A Dumaidi 2000).

1.2 General description

Diabetes is chronic and progressive disease that can be life threatening. While the severity of disease and its complications is not perceived as in other diseases like AIDS or Cancer, yet the illness can be just as serious, diabetes is among the fastest growing health problems with emphasis on special populations and population groups. People living in urban regions, who are leading sedentary lifestyles. (Alberti KGMM1998)

From etiological, clinical and mechanism of onset, Diabetes mellitus was classified into a number of types that have in common the major sign of hyperglycemia but that differ concerning the mode of onset, risk factors, progression and mode of treatment.(Albert KGMM 1998)

1.2.2.Type 1 (Insulin Dependent Diabetes Mellitus, , IDDM), Type I diabetes occurs in about 20% of all diabetic patients. This characterized by insulin deficiency resulting from immune-mediated pancreatic beta-cell destruction. Type I diabetes result from the destruction of the pancreatic beta cells, through an autoimmune process of unknown etiology, leading to insulin deficiency and associated ketoacidosis. Pancreatic beta-cell destruction eventually results in absolute insulin deficiency. The pathological process accurse in genetically predisposed individuals over many years and appears to be triggered by environmental factors such as viral infections and nutritional factors such as ingestion of cows milk in early childhood. This type usually appears in the young age and is often associated with rapid progress and aggressive clinical picture, with a marked tendency to early development of acute and chronic complication. Another characteristic of this type is called insulin dependent, because the control of the disease can be achieved only by using external insulin substitution.

(Non Insulin Dependent Diabetes Mellitus, NIDDM).

Type II Diabetes mellitus is characterized by high blood glucose concentration (West KM.1978) or according to reduce sensitivity to insulin in peripheral tissue (West Lund K1972). The world health organization recognizes five categories of Diabetes and in addition lists a sixth conditions.

This is the most common In developed countries, it represents 85-90% of diabetes patients, while in the developing countries this percentage is even higher (West Lund K1978), because people have been attributed to increasing Westernization, changing their habits of diet and lifestyle changing their jobs working at offices leaving their land.

NIDDM appears at older age than IDDM, the onset and the progress of this type of diabetes is less acute, and the development of complications is less aggressive than in Type 1. Insulin resistance is an derlying problem in Type II, it means that the body produces insulin but cannot use it effectively. Usually, insulin resistance makes it more difficult for blood sugar to be transferred to and utilized by target tissue cells. The ability of pancreas to produce insulin remains intact, while the ability of the insulin to mediate the utilization of glucose by target tissue is impaired. This leads within the early stages of disease even to the increased secretion of insulin

and consequently leads to the condition recognized as hyperinsulinemia.

At later stage, when the pancreas loses its ability to compensate, it starts to produce less insulin and in these cases exogenous insulin use becomes the treatment alternative even for type 2 diabetics. (Haffner S; 1996)

1.2.4 Impaired Glucose Tolerance (IGT):

Condition called impaired glucose tolerance (IGT), a state between normal and Diabetic could indicate that person already started the development of reduced ability to utilize glucose in normal pattern, inspite of the fact that symptoms are not present and complications are absent. The development of impaired glucose tolerance may increase the risk of the occurrence of heart disease and stroke. During the stage of Impaired Glucose Tolerance there may be no symptoms or symptoms may develop slowly.(Mayfield J.1998).

1.2.5 Other forms of diabetes for 5% of all diabetic patients, these are

Malnutrition related diabetes mellitus (MRDM)

(Secondary Diabetes) Diabetes associated with other condition and syndromes such as :

1- Pancreatic disease

2- Disease of Hormonal etiology

3- Drug- induced or chemical – induced diabetes.

or its receptors certain genetic

syndromes (Taylor R,1983).

5- Gestational diabetes: this form is usually observed during

pregnancy(Medaiie JH1978), It has   effect on the babies

,increased birth weight and possibly increased prenatal

mortality, and is also a risk factor for the development of

NIDDM in the mother(Ohlson L-O1987)Impaired Glucose

Tolerance :

All studies indicate an increased risk for the development of diabetes

in persons with IGT, this risk is related to the severity of IGT. People with

IGT tend to be obese, and more often have a family history of NIDDM than

similarly aged people with normal glucose tolerance. They have higher

fasting and postload insulin levels and greater degree of insulin levels and

greater degree of insulin resistance than normoglycemic people (Harris MI

1998).

In our Demonstration, we shall focus on Type II Diabetes Mellitus as

this one is widely spread and forms a critical area for public health and

health promotion interventions.

Etiological factors predisposing to the appearance of Type II diabetes

are shown to be the development of insulin resistance in the muscle tissue,

and consequently increased insulin secretion. This is characterized by

peripheral insulin resistance and relative insulin deficiency, which may

n secretary defect with insulin resistance (Haffner S.1996).

Some patients develop severe insulin deficiency. Obesity is common in patients with Type II diabetes and itself causes insulin resistance. Resistance to the action of insulin takes the form of a decrease in the ability of skeletal muscle to utilize glucose (due to reduction in activity of the enzyme glycogen syntheses) and oxidize glucose(due to reduction in pyruvate dehydrogenate activity). The risk of developing Type II diabetes increases with age, obesity (particularly central obesity), cardiovascular disease,and a lack of physical activity (Haffner S;1996).

1.3 Diagnosis

1.3.1 Chemical Diagnosis:

-Fasting blood glucose test (F.B.S) : Fasting Blood Glucose Test is a method for finding out how much glucose (sugar) is in the blood. The test can show if a person has diabetes. A blood sample is taken in a lab or doctor's office. The test is usually done in the morning before the person has eaten (Albert KGMM 1998).

The normal, non diabetic range for fasting blood glucose is from 70 to 110 mg/dl, If the level is 126 mg/dl or greater, it means the person has diabetes this is the new criteria, the old one was considered person as adiabatic when have the level 140 mg/dl the evidence used for the new diagnostic criteria is from epidemiological studies cited by Mayfield that

risk of complication beginning with fasting plasma glucose levels as low as110to120mg/dl (American Family Physician) October 15,1998.

1.3.2 Clinical Diagnosis

Diabetes is normally diagnosed by different symptoms and signs indicating elevated blood sugar, thirst, osmotic polyuria (increased frequency for urination), fatigue, skin infection, in creased susceptibility to urinary tract infection.) (Pettit DJ 1988).

1.3.3Diagnosis by Appearance of Complication: At many cases diabetes type 2 had diagnosed when its too late and the complications start to appear.

-Fasting blood glucose test (F.B.S) : Fasting Blood Glucose Test is a method for finding out how much glucose (sugar) is in the blood. The test can show if a person has diabetes. A blood sample is taken in a lab or doctor's office. The test is usually done in the morning before the person has eaten (Albert KGMM 1998).

1.4 Risk Factors

The etiology of diabetes is not fully understood, but in general genetic, lifestyle – environment and Diet factors are thought to interact in the occurrence of the disease.

1.4.1 Genetic Factors:

occurs at relatively early age, described or maturity onset Diabetes of the young called (Mody), Mason- type diabetes or non insulin department diabetes of the young (NIDDY) shows a district pattern of inheritance (Estman Rc,1997) Mody is linked with gene (adenosine deaminase) on chromosome 209 in one large pedigree, and its pathogenic significance are unknown., This form of NIDDM can have its onset in the teenage years or in young adults,(WHO, 1994) NIDDM in the young is sometimes, but not always associated with obesity. It may be asymptotic and is often identified as result of glucosuria or glucose tolerance testing (Zimmit p 1996)

Indian and theTamil Indian community in South Africa are examples of communities showing high prevalence of Diabetes (West Lund K,1972).

1.4.2 Environmental Factors:

The development of NIDDM is influenced substantially be environmental factors. Several lines of evidence can be cited. First, the frequency of development of NIDDM changes when populations move to a different environment. Second, there is evidence of large secular change in the prevalence and incidence NIDDM. These are far greater and have occurred much more rapidly than can be explained on the basis of genetic drift.

Third, the occurrence of NIDDM within a population is related to demographic and environmental characteristics such as age, the degree of

ary habits and degree of modernization. (Frisch RL,1980)

Emigrants from developing countries to industrialized countries are especially exposed to rapid and deep changes of the lifestyle and a rapid reorientation toward a sedentary life style. Such change has proven to predispose the markedly higher prevalence and incidence of the disease among those migrants compared to local original population (Harris MI.1998)

1.4.3 Sex

The relative frequency of NIDDM in relation to gender varies. In many populations, as in the USA as a whole, there is a higher prevalence of NIDDM in females than in males (Taylor,1983). On the other hand, in some countries, such as India and Nauru, male excess has been demonstrated (Knower WC,1981). The differences in sex ratio of diabetes in different societies can probably be explained by differences in the relative frequency of obesity and physical activity among the sexes in different cultures and ethnic groups.(Taylor,1983).

1.4.4 Age

The prevalence of NIDDM increases with age in most population although some studies show a fall in the oldest age groups. In the USA, the National Health Interview Surveys have estimated the increase up to the ages of 65-74 years, with no further rise in those aged 75 years and over.

- specific incidence of NIDDM shows a progressive increase with advancing age (Harris MI,1987).

1.4.5 Obesity

Obesity is most often defined as being 20% or more over ideal body weight. (From Medical Services Organization, L.L.C.)

Obesity is the leading cause of diabetes.

The relationship between obesity and diabetes has been recognized for centuries (WHO 1994)). There is clear evidence that NIDDM is more frequent among obese people, Moreover, the relationship between the occurrence of NIDDM and obesity measured at a point in time is complicated because diabetes itself may lead to weight loss: most patients with diabetes are encouraged to lose weight and some do so; others continue to gain weight even after diabetes has developed.

Where incidence studies have been performed there is universal agreement that NIDDM incidence is a function of previous obesity (Everhartj, KnowlerWC 1985),(Abuja MMS,1979). This was true among male executives (Metzger BE.1987), in the studies in Framingham, Massachusetts (The effect 1993), Norway (King H. and Jarret R1982), Sweden (Nicholas,1998), oxford, Massachusetts , Israel (WHO1991).

Males have a higher resting metabolic rate that females so males require more calories to maintain their body weight. Additionally when women become postmenopausal, their metabolic rate decreases

...e reason why many women start gaining weight after menopause.

1.4.6 Nutrition:

Until now no kind of nutrients is significantly associated with diabetes (Nicholas,1998). On the other hand, diets with high fat and low carbohydrate consumption are accused in disease etiology (NTH 1986). Hamsworth showed that diabetes mortality declined markedly During the 1914-18 war in Berlin and Paris both cities with severe food short age where in New York and tokyo, where there were no shortages, mortality from diabetes remained constant or even increased (King H,1998). He also showed a relationship between mortality rates from diabetes indifferent countries and the proportion of fat contained in the diet (NTH 1986).

1.4.7 Life Style:

Sedentary life Style:

People with higher than average risks for Types II diabetes are those who are overweight and people who are not physically active. (Fajans SS.1982).

Some studies have seriously addressed the relationship of NIDDM and physical activity.

Physical activity certainly influences glucose metabolism (Donctrin M Kart JD,1984).

...y of Melanesian and Indian men in Fiji reported the prevalence of diabetes to be twice as high in those considered sedentary or undertaking only light activities, compared with those performing moderate or heavy exercise-differences which remained when the confounding effects of age and obesity were taken into account (Helmrich S 1994).

In women who participated in college athletics, and who tend to remain more active in later years, was one- half that in women who had not participated in athletics in college (Bogardus Cravussin 1984).

Type II diabetes has been characterized as the epidemic of our time. It is responsible for more than 14 million cases of diabetes in the US and is the leading cause of new blindness and kidney disease. Diabetes also causes nerve disease heart disease, and stork. Each year, at least 190,000 people die from diabetes and its complication (Tai T- Y 1987).Physical exercise has been found to have a major role in maintenance of beta cell function, reduction of weight , and improvement of the peripheral tissue sensitivity to insulin,so reduce the risk to develop the disease (Focus.hms.2001).

A number of studies have shown that physical activity and exercise are significantly associated with lower incidence of diabetes, even in the high risk individuals (Helmrich S: 1994)

1.4.8Other Risk Factors For NIDDM:

higher prevalence of NIDDM in urban environments than in rural ones (Ohlson L-O Larsson B, 1987) (Balkau B, 1985). In the prevalence of NIDDM between urban and rural environments in developed countries such as an USA, studies in many developing countries show a prevalence of NIDDM several times greater in urban that in rural populations (Zimmet P 1977) . Reasons for these differences are uncertain, but in developing countries many features of the urban and rural environment differ.

In urban areas, occupational activities are more often sedentary than in rural areas where agriculture is the predominant occupation. Urban dwellers are usually more obese, due to reduced physical activity and \ of increased energy intake. . The diet in urban areas often contains a greater proportion of refined carbohydrates, less fiber and more fat in comperison to that in the rural environment (Stepheen O , 1997).

1.5 Complication:

The complication resulting from the disease are a significant cause of morbidity and mortality and are associated with the damage or failure of various organs such: Eye disease and blindness.

1.5.1 Retinopathy:

Screening and care could prevent up to 90% of diabetes – related blindness.

1.5.2 Nephropathy:

diabetes develop kidney failure each year, treatment to better control blood pressure and blood glucose levels could reduce diabetes- related kidney failure by about 50%.

1.5.3 Amputation:

Regular examination and patient education could prevent up to 85% of these amputations.

1.5.4 Cardiovascular disease:

Heart disease and stroke cause about 65% of deaths among people with diabetes.

1.5.5 Pregnancy complications:

About 18000 women with preexisting diabetes deliver babies each year, and anestimated 135000 with gestational diabetes. These women and their babies have an increased risk for serious complications,screening and diabetes care before and during pregnancy can reduce the risk for complication such as congenital malformation, and the need for cesarean sections (htt:www.cdc.gov/).

Diabetes is a growing public health problem and it is a seriously, costly disease that is on rise all over the word.

Diabetes is considered as a growing and life threatening health problem for the whole world (Stern E, Blau Rusecki.y, 1988).

…abetes millets is public health night mare, consider the following.

Of the estimated 15.6 mellion persons nation wide who have diabetes, a projected 5.4 million persons are unaward that they have the disease, individuals may remain undiagnosed for an average of five to ten years.(Harris MI.1998).

Diabetic retinopathy is the number one cause of blindness in working – age adults in the united states but an estimated 90 percent of vision loss associated with diabetes is preventable (Osullivan JB,1965).

1.6 Epidemiology of TypeII Diabetes Mellitus:

1.6.1 In Asia:

The Asia pacific region was likely to be hit hardest as numbers of people with diabetes were for cast to exalt from 30 million to 55 million by 2020 (Palumbo PJ, 1976).

The prevalance of Type II diabetes among people over the age 30 ranges from two percent in China to 40-50 percent in parts of the Pacific Island of Nauru.

In Malaysia the rate is around five percent wile in Singapore and Hong Kong around 15 percent of people over 30 are thought to suffer (Zimmet P.Z, 1992).

1.6.2 In Israel:

grants born in many different countries. The Ashkenazie Jews originated mainly from central and eastern Europe, and the non Ashkenazim originated from the Mediterranean and Middle Eastern areas.

In many instances the original communities were genetically isolated for centuries. Unfortunately, surveys of diabetes using the currently accepted international criteria for the diagnosis have not been performed, making rigorous comparisons among the various ethnic groups impossible.

Diabetes, however, was reported to be rare among newly arrived immigrants from Yemen, but was much more common after long-term residence in Israel (Stern E, 1999).

A recent study among factory workers in an urban environment, however, found the overall prevalence of diabetes to be lowest in workers of African and Asian origin (1.2%), intermediate in those of American and European origin (4.9%), and highest in the Israel- born (5.5%) (Rubin RJ, 1994).

1.6.3 Diabetes Epidemiology in the Arab Counties:

Several studies have been conducted in several Arab countries in order to estimate the prevalence of diabetes. The prevalence rate of 13.4%, 14.8%, 13.1% and 10% were reported in Jordan, Kuwait, Oman, and Tunisia, respectively (Albert KGMM,1998) (cohen. AM, 1979). Risk factors that contribute to such a high prevalence rate were, over weight,

history (Abedla N, 1998) (Himsworth III ,1935) .

1.6.4 Diabetes in Saudis Arabia :

Type 2 diabetes mellitus occurred at the highest prevalence in males (11.30%) and females (6.61%) in the northwestern regions. In almost every region the prevalence in almost every region the prevalence in the males was significantly higher than the females and in both sexes the prevalence rose significantly (Patel M Jamrozik 1986) (Ajlouni K, 1998).

1.6.5 Diabetes in Palestine:

Studies enlightening the Epidemiology of diabetes in the Palestinian community are scarce. Data about the Prevalence are extracted from registries of health services in governmental and UNRWA diabetes clinics. Patient attending private sector or people with undiagnosed diabetes are therefore under- represented in any estimation of the incidence of diabetes (Bennett el, 1968). In 1995 the community health Department, Birzeit University conducted a study that showed an increased role of diabetes in morbidity and mortality rates (Reaven GM). The same study, based on amputations surgical reports from AL-Ahli hospital in Hebron, showed that diabetes complication were behind most of these operations and around 48% of patient admitted to the medical department were diabetic or with diabetic complication (Community Health Department,1995).

...ence of diabetes in Palestine is being conducted by Al-Quads university in which the preliminery results show that the prevalence rate is around 9.1% (AL- Quads University Study,2000). The risk factors that contribute to the occurrence of diabetes in Palestine are not known, however, genetic, environmental and lifestyle factors are expected to be involved (Neil MAW,1987).

The occupational activities are almost sedentary, the diet often contains a greater proportion of carbohydrates, less fiber and more fat, also reducing physical activity, increasing obesity with no awareness, are all thought to be important factors in determining the risk of diabetes in urban Palestinian community.

1.7 Socio- Economic Impact of Diabetes:

Diabetes is a major health problem and the leading cause of death (Neil MAW,1987). It is the most common cause of blindness among middle age and elderly people and a major cause of renal failure resulting in further need for dialysis and or kidney transplants (Stern E, 1999). It is the most common cause of lower limb amputation. In addition diabetes increase the risk for myocardial infarction or stroke, and which may lead to functional disability (Neil MAW,1987) (Stern E, 1999).

By year 2020 the number of diabetic patient is expected to exceed 250 million (Stern E, 1999). Apart from the human suffering this epidemic

...s available for the treatment and prevention of other diseases in poor countries (Stern E, 1999).

More than 13 million people are estimated to have diabetes in U. S.A (Harris MI, 1998). Nearly half of them don't know if they have the disease and not receiving treatment while silent damage may place them at great risk for heart attack, strokes, Kidney failure blindness and amputation (American Diabetes,1996).

In 1992, diabetes cost American Authority Around 92 billion dollar, 45,2 billion in direct medical cost an 4,4 - 6,6 billion in loss of productivity due to disability and premature death (helmrich SP,1991).

In Israel, the prevalence of diabetes is 3.5% in women, and 4.3 in men and this rate in creases to 10.3% at the age of 60 years or more (Rubin Rj,1994). A study estimated the cost of care for diabetics in eight hospitals was found to be 36 million USD, which constitutes around 10.2% of the total budget of these hospitals (Reaven GM). From all of the above mentioned, it is clear that diabetes is a growing serious public health problem that requires a great attention in all country.

1.8 Aims of the Study:

From the mentioned above, and as diabetes is becoming a major public health problem in the Palestinian community, and based on the fact the studies about the disease and its risk factors in the Palestinian community are rare, our present study tries to enlighten the factors

of type2 diabetes in a typical Palestinian

community.

More concretely, our study aims to enlighten the effect of lifestyle

and type of diet in the Palestine community on the occurrence of type2

diabetes mellitus.

For all the previous problem and complication of the disease it consider as

public health problem. There are no studies to in light on type two diabetes

and show the effect of lifestyle and type of diet in Palestine

☐ To recognize the risk factors that help in appearance of NIDDM in

  Palestine society particularly in Nablus City.

☐ To estimate the degree of awareness related to D.iabetes type 2 that

  reflects general health awareness among Palestinian community.

Diabetes mellitus type 2 is one a mong the multifactorial disorders that occurs at a high prevalence in or older age groups all over the world. The prevalence is affected by both diet and environmental factors.

Nablus is considered as the third largest district in the number of population with 251 thousand. Among Palestinian city

2.2 Sample selection:

First taken a pilot sample content from 20 males and females >35 years workers and employers.

Then the study focus was on people knowing that they haven't diabetes. The study group include 156 adult males and 161 females > 35 years working in different places in Nablus city.

Males were divided according their jobs: teachers-workers- bank employers- businessmen. Females were divided to two groups: who stayed at home or work out side.

2.3 Data collection:

On the day of the visit people who we concern were requested to remain in a fasting state, an early morning visit was made and the questioner paper was filled and height and weight data were used to calculate body mass index (BMI using the formula:

) fasting glucose level was measured by using blood gloucometer (MEDISENSE) and by using sensor electrodes strips. Testing was provided by the researcher, who also provided the anthropometric measurements and filling of the questionnaires through an interview with people agreeing to undertake the research. Taking three months all the samples from January to first of April 2002.

It was clear the acceptance of the people to do the test and they were very helpful.

Individuals, selected for the study where those who did not have previous knowledge about having diabetes. Most of those did not even have their blood sugar measured prior to the study.

2.4 Data Analysis:

- All data of Questionnaire for 317 sample were entered the computer &computed using SPSS program & applying Chi-Square test, with level of significant (P value =0.05).

3.1 General Characteristics of the Study sample

Table 1- background information:

3.1.1 Age profile of study sample:

Table (1)

Age and Sex profile

Age	Male		Female		Total
35-45 years	87	55.8%	79	49%	166
46-55 years	49	31%	61	37%	110
56-65 years	17	10.5%	18	11.1%	35
> 66 years	3	1.9%	3	1.9%	6
Total	**156**		**161**		**317**

Total represents the sample size according age

Males:

From the study sample there were 55% between 35-45 years, 31% were between 46 –55 years, 10.5% age group 56-65 years, and 1.9% above 66 years.

Females :

49% of the sample were at age group 35-45 years, 37% were at age 46-55 years, 11.1% at age group 56-66 years and 1.9% over 66 years.

Table (2)

Background information:

		Male E		Female F		Total
No. of study years	Secondary or less	47	30.1%	32	19.8%	79
	More than secondary	109	69.8%	129	80.2%	238
	Total	**156**	**100%**	**161**	**100%**	**317**
Social status	Alone	5	3.2%	8	4.9%	13
	With the family	151	96.8%	153	95.1%	304
	Total	**156**	**100%**	**161**	**100%**	**317**
Marital Status	Married	146	93.6%	119	73.9%	265
	Single	10	6.4%	42	26.1%	52
	Total	**156**	**100%**	**161**	**100%**	**317**
Place of residency	City	123	78.8%	147	91.3%	270
	Village	30	19.2%	12	7.5%	42
	Camp	3	1.9%	2	1.2%	5
	Total	**156**	**100%**	**161**	**100%**	**317**

Total represents the sample group:

- 75% of the total sample finshed high education, 24% had finished secondary or less educated.

- 80% of the females were finshed high education while 69.8% of males.

- About being alone or stay with their family most of the sample males and females 96%,95% stay with the family.

- 26% of females were single not married, 6.4% of males were single.

Table (3)

Background information

Type of work Re. Physical demand	Number of cases	Percentage
High (Messenger,Peddler Driver, worker)	60	18.9%
Moderate (Mechanic, Engineer,housewife)	43	13.6%
Low (Employee, Dentist, Pensioner,Trader)	214	67.5%
Total	**317**	**100%**

-Classification of the work to three groups according to required physical activity,fiest one whom their work required high phsical activity, second whom required moderate one,the last group which required no phiscal activity through their work.

of the group according to life-style.

		Male E		Female F		Total
Smoker	Yes	71	45.5%	30	18.6%	101
	No	75	44.9%	127	78.8%	197
	Total	**156**	**100%**	**161**	**100%**	**317**
Physical activity, outside work	1-3 (low)	108	69.2%	97	60.2%	205
	4-7 (moderate)	37	23.7%	57	35.4%	94
	8-10(high)	11	7%	7	4.3%	18
	Total	**156**	**100%**	**161**	**100%**	**317**
Sport	Yes	80	51.2%	69	42.6%	149
	No	70	44.8%	81	50.3%	151
	Previous	6	3.8%	11	6.8%	17
	Total	**156**	**100%**	**161**	**100%**	**317**
Diet patterns	High> 1800 calori	52	33%	71	44%	123
	Medium (1200-1800)	61	39%	47	30%	108
	Low (700-1200)	43	27.5%	43	26%	86
	Total	**156**	**100%**	**161**	**100%**	**317**

-

- Smoker: who smoked more than 15 cigarettes

- From the study sample 45% of males were smoking, while 12% of females were smokers.

- And 64.9% of the sample have a profession that need no physical activity, with 69.2% of males and 60% of females.

- Also 51% of males reported ingegement in regular sport, while 42% of females reported ingagement in regular sport.

- About females 49% consumed food with high calories and 33% of males consumed high calory foods.

Table (5)

Clinical parameter

		Male		Female F		Total
BMI	obese BMI > 30	34	21.7%	27	16.7%	61
	Over weight BMI > 25<30	40	25.6%	36	22.5%	76
	Normal BMI (20-25)	82	52.6%	98	60.8%	180
	Total	**156**	**100%**	**161**	**100%**	**317**
F.B.S	Normal <105	114	73.1%	138	85.7%	252
	Diabetes >126	32	20.5%	16	9.9%	46
	IGT(105-126	10	6.4%	7	4.3%	17
	Total	**156**	**100%**	**161**	**100%**	**317**

- 21% of males fall in the obese category with BMI more than 30, while 16.7% of females fall within this category.

- 25.6% of males were overweight with 22.3% of females were overweigh.

- 14.5% were diabetics from the study sample.

- 5.3% of the sample fall in the Impaired Glucose Tolerance (IGT) range .

- 26.9% of males fall in the diabetic range with 14.2% of the females were within diabetic range included IGT.

-

5.2.1 Age & F.B.S.

Table No. 6 shows the chi- square test for the relation between age (divided into two age groups 50 years and less and more than 50) and the occurrence of diabetes. While only 29.9% of the older age group had normal values of fasting blood sugar, 70.1% of the younger age group had normal value of fasting blood sugar. This relation was found to be statistically significant with P. -value 0.016. Between the age and the occurrence of Diabetes

Table (6)

Relation between the variables of age and occurrence of Diabetes

	Age				
Total	**More than 51**		**50-35**		
271	81	29.9%	190	70.1%	**Normal**
46	22	47.8%	24	52.2%	**Diabetic**
317	103		214		**Total**

P Value -0 .016

This relation was expected to examine the significance of the relation between the occurrence of diabetes mellitus and sex. As shown in table No.7, there was detected a significant relation between sex and occurrence of diabetes with Sig.value 0.003 with higher risk for the development of diabetes affecting the male study population

Table (7)

Relation between the variables of gender and occurrence of Diabetes

Total	Female		Male		
		Gender			
271	147	54.2%	124	45.8%	Normal
46	14	30.4%	32	69.6%	Diabetic
317	161		156		total

P Value- 0 .003

-69.6% from Diabetic people were males an 30.4% were female

Only 8.6% were diabetics from females and 20.5% in males.

...sion &F.B.S.

To study the relationship between Diseases & F.B.S, we applied chi-square test to the two variables in the following table.

Table No (8)

Relation between the variables of diseases and occurrence of Diabetes

Total	No		Heart		Blood Pressure		
			Diseases				
271	234	86.3%	9	3.4%	28	10.3%	Normal
46	29	63%	3	6.6%	14	30.4%	Diabetic
317	263		12		42		total

P-Value less than 0 .001

The results of the test show that the value of the significance level is less than .001, which is less than the value given in the hypothesis i.e. 0.05, so there is statistically significant correlation in the 0.05 significance level between the diseases and the occurrence of diabetes.

Table No. 9 shows the chi- square test for the relation between Physical activity(divided into three groups' high moderate and low Physical Work) and the occurrence of diabetes. 82.6% Diabetic in the group with low physical work, 17.4% of Diabetic in the second group with moderate physical work, and the third one with high physical work had no diabetes occuence. This relation was found to be statistically significant with p-value 0.002 (<0.05) there is statistically significant between the physical work and the FBS variable.

Table (9)

Relation between Physical work and the occurrence of Diabetes

PHYSICAL WORK							
Total	8-10		4-7		1-3		
271	18	6.6%	86	31.7%	176	64.9%	Normal
46	-		8	17.4%	38	82.6%	Diabetic
317	18		78		205		Total

P .-Value 0 .002

.S

To study the relationship between hardness of work & F.B.S, we applied chi- square test to the two variables the result of the test shows that there is no statistically significant relationship between the two variables .

Table No (10)

Relation between hardness of work and the occurrence of Diabetes

Total	Hard		Easy		Office		HARDNESS
271	56	20.6%	179	66.1%	36	13.3%	Normal
46	4	8.7 %	35	76.1%	7	15.2%	Diabetic
317	60		214		43		Total

P-Value 0 .16

To examine the assumption between the smoking variable and the FBS, we applied chi-square test to the following table between the two variables.

Table (11)

Relation between Smoking and the occurrence of Diabetes

Total	No		Yes		
		Smoking			
271	191	70.5%	80	29.5%	Normal
46	25	54.3%	21	45.6%	Diabetic
317	216		101		Total

P. -Value was 0 .03-

The results of the test show that the value of the significance level is 0.03 (<0.05) so there is statistically significant between smoking and FBS variable

Table no (12) show the chi square test for the relation between food & occurrence of Diabetes it divided into three groups according to type of food (high, medium and low calories) the group which the people take high calories in their food the occurrence of Diabetics was69.6%, 19.6% at the medium group and 10.8% at the group which they took low calories. This result was found statistically significant with P value less than 0.001 between the two variables

Table No (12)

Relation between food and the occurrence of Diabetes

	Food					
Total	**Low**		**Medium**		**High**	
271	81	29.9%	99	36.5%	91	33.6%	Normal
46	5	10.8%	9	19.6%	32	69.6%	Diabetic
317	86		108		123		total

P-Value less than 0 .001

This relation was expected to examine the significance of the relation between the occurrence of diabetes mellitus and sport . As shown in table No.13, there was a significant relation between sport and occurrence of diabetes with p-value 0.037 with higher risk for the development of diabetes affecting the study sample.

Table No (13)

Relation between the variables of SPORT and occurrence of Diabetes

Total	Previous		No		Yes		
269	13	4.8%	121	45%	135	50.2%	Normal
46	2	4.3%	30	65.2%	14	30.4%	Diabetic
315	15		151		149		total

P-Value 0 .037

sting Blood Suger:

Table No. (14) shows the chi- square test for the relation between BMI (divided into three groups obese, over weight and normal) and the occurrence of diabetes. This relation was found to be statistically significant with P-value (0.013) <0.05 which is statistically significant.

Table (14)

Relation between the variables of BMI and occurrence of Diabetes for all the group

	BMI						
Total	Fat BMI >30		Over weigh BMI >25		Normal BMI (20-25)		
271	46	17%	61	22.5%	164	60.5%	Normal
46	15	32.6%	13	28.2%	18	39.1%	Diabetic
317	61	19.2%	74	57.4%	182	57.4%	Total

P-Value less than 0.013

asting Blood Suger for male group

To study the relationship between BMI &FBS for male group, we applied chi- square test to the following table between the two variables.

Table No(15)

Relation between the variables of BMI and FBS for the male group

Total	Fat BMI >30		Over weigh BMI >25		Normal BMI (20-25)		
			BMI (male)				
124	23	18.5%	33	26.6 %	68	54.8%	Normal
32	10	32%	6	18.%	16	50%	Diabetic
156	33	21.2%	40	25.6 %	83	53.2%	Total

P Value was0 .283

The results of the test show that the P value Is 0.283, it is no statistically significant l between the body mass index and the occurrence of Diabetes variable for the male group

Fasting Blood Suger for female

In order to find out the relationship between BMI & F.B.S for the female group, we applied chi- square test to the following table between the two variable.

Table No(16)

Relation between the variables of BMI and occurrence of Diabetes for the female group

BMI (female)							
Total	Fat BMI >30		Over weight >25		Normal BMI (20-25)		
145	22	15.2%	27	18.6 %	96	66.2%	Normal
14	5	35.7%	7	50%	2	14.3%	Diabetic
159	27		34		98		Total

P- Value was 0 .001

The results of the test show that the significance level is .001 (<0.05) this is statistically significant level between the body mass index and occurrence of Diabetes in females .

This assumption was supposed to examine the relationship between

education & F.B.S, after applied chi- square test the result of P value

was0.843 it indicate that there is no statistically significant between the two

variables..

Table (17)

Relation between the variables of EDU and occurrence of Diabetes for all the group.

Total	More than sec		Sec &less		
	Years of EDU				
271	204	75.3%	67	24.7%	Normal
46	34	73.9%	12	26.1%	diabetic
317	238		79		total

P-Value 0 .843

3.2.15 State of living

In order to find the relationship between the two variables we applied chi- square test in the table below.

Table (18)

Relation between the variables of statues and occurrence of Diabetes for all the group.

Total	Single		Married		
		Residence			
271	48	17.7%	223	82.3%	Normal
46	4	8.7%	42	91.3%	diabetic
317	52		265		total

P-Value 0.127

The results of the test show that the value of the significance level is 0.127 which is higher than the value given in the hypothesis i.e. 0.05 so there is no statistically significant between the residence and the FBS variable

This study was conducted to identify the risk factors of NIDDM among adult people in Nablus

4.1 Social profile:

4.1.1 Age:

Most of the sample in the study were 35-45 years (55% males, 49% females), followed by 31% males and females aged 46-55 years old, only 1.9% males above 66 years in males and females. Table (1). This result is expected because we choose the groups according their jobs and the age 35-55 years is the suitable age for working.

4.1.2 Education of the study sample:

75 % finished high education while 24.9% had finished secondary or less, females (80%) > than males (69.8%). This may be due to our political situation that make women in many cases responsible for her family, the education will give females security and safety in their life, and also the political situation lead males to the prison so enforced to leave education .

4.1.3 About being alone:

About being alone or live with the family the result indicates that almost all the groups stay with their family in Table (2), females who lived alone 26%, males 6.4%, almost all the group from Nablus city or came from villages or camps near to Nablus for working.

4.2 Type of work:

according their work which need high, moderate or low. Physical activity (18.9%, 13.6%, 67%) Table (3) here persons were asked about the nature of their work ..

4.3 Life style profile:

4.3.1 Smoking:

Males reported more smokers than females (45% males- 18.6% females). Table (4). They have more stress in their life, more responsibility, females have social barriers to be smoking .

4.3.2 Physical activity at work:

67% from the entire sample spend time of work about eight hours calm beyond their office, or their jobs did not need physical activity. Table (4)

4.4 Sport:

The number of males that making sport are 51% while females are 42% , more men reported to exercise, this is typical finding in the Palestinian community, where women especially at elder group would not engage into any kind of physical exercise., Table (4).

4.5 Type of food:

In table (4) women taking food with high calories are 44%, in males were 33% this may be because women stay at home for long time this encourage her to eat more than men, and type of food in our days changes

more than healthy one which have more

calories.

4.6 Clinical parameters:

4.6.1 BMI

In table (5) in males it was found 21.7% obese and 6.7% of females were obese, 25.6% of males were over weight, 22.3% of females, at the two groups of the sample were have normal weight. This result show that males and females were obese and over weight for many reasons, type of food which have high calories full of fat and carbohydrates & having no physical activity during the day at work or in their free time. Even moderate obesity, particulary abdominal obesity can increase the risk of non insulin dependent diabetes mellitus. fat tissue has two roles in promoting diabetes it increases the demand for insulin and in obese individuals it create insulin resistance and there for Hyperinsulinemia.

Weight reduction in the obese NIDDM will lead to improvement of glycemic control.

4.6.2 F.B.S:

19.8% of the sample were diabetic, males were (26%0, females (13%0) this result almost near to the result in Saudi Arabia in north regions (44-9), due to sharing the same type of food,spending all the free time watching TV or visiting each other, the same religions, thinking and education.

The relation between F.B.S & all possible risk factors was analyzed & assessed.

4.7.1 Age & FBS:

Table (6) shows that (11.2%) at age 35-50 years are diabetic and (21.3%) at age 51 years and over are Diabetic, the second group has bigger percent which mean that the disease appear more at the elder age. Several studies show that like in (Knower WC, 1981) (Harris MI< 1987) . In the USA the national Health Interview Surveys do studies indicate that incidence increase up to the ages of 65-74 years with on further rise in those aged 75 years and over.

4.7.2 Gender & FBS:

Diabetes Mellitus occurs at male group more than female where 20.5%, 8.6% as calculate from table (7). That was also found in study done in Saudi- Arabia. (Patel M,1986) (Ajlouni K, 1998). But in some studies show NIDDM in females more than males. The different in sex ratio of Diabetes in different societies can probably be explained by differences in the relative frequency of obesity and physical activity among the sexes in different cultures.

...art disease) & FBS:

The individuals who have hypertention 33.3% from them have diabetes and who have heart disease 25% are Diabetic. It indicate that the two diseases help in appearance of the disease but pressure consider as a high risk factor than heart disease, it is in table (8) as the study in (Zimmet P, 1977) (Stephen O, 1997) .

4.9 Physical Activity at work & FBS:

Table (19) shows the different percent of the diabetic persons are: 9%, 16.9, 9.2%, 7% which means that when the work has no physical activity it lead more for the appearance of the disease. The number 1,2,3,4, to table (9) indicates the level of the physical activity at work. We notes that the appearance of Diabetes between the group increase when the physical work decrease, at table (10) in spite that there is no statistically significant between the two variables we notice that the type of work reported more diabetic persons from the groups which have easy or officer work .

At work if person tries to do any physical active during his work like walking to the work in the morning, talking stairs even if his work need no physically activity it will help him to loss some calories.

4.10 Smoking & F.B.S. relationship:

The study reported a relation between smoking & occurrence of FBS with significant level 0.03 smoking rise the levels of LDL and Triglyceride,

ivity, the sample in this study reported that 45.5% of all the group was smoking with percentage of 45.5% in males and 18.6% in females , this different in percentage is due to the barriers in the community that prevent women to smoke the social one and the stress that men live with it with the full responsibility for every thing make them more smokers ,this result like the result in EMR where 40% of male where smoking there (Wilson PW,1981).

1- 4.11 Food & FBS:

We divided the amount of food, which had taken before 24 hours before the questioner into groups: low, medium, and high calories. It is clear in table (12) that the people who have high calories in their food have 26% diabetes and the second groups with medium calories 8.3% are diabetes and who with low calories intake 5.8%.

Low calories: 700-1200

Medium calories: 1200-1800

High calories: 1800-2500 (Bennett, EL,1968)

The study does indicate that excessive total food in taken is associated with an increased in people who have diabetes and proportion of complex carbohydrate, and more animal fat lead to obesity coupled with less activity lead to high risk of having Type II diabetes. (West KM,1978)

In addition to obesity, age, gender, diseases and physical work there is life style and lack of exercise at table (13) shows that 30.4% from the people who play sport are diabetics and the group which never play sport the disease is found 65.2% and in people who was played previously 4.3%. Physical activity help to reduce risk of type2 diabetes in two different ways:

By being over weight is related to a higher risk of Diabetes so losing weight cuts risk. Physical activity improve insulin sensitivity, allowing the body to make better use of insulin there are many studies say that physical activity lead to increase in glucose metabolism (Dowse K, 1990) and study in India (Helmrich S, 1994) and a cohort study also (Tai T-Y,1987). In our study men making sport more than women may it because the nature of the people not accept any change in the tradition in the society so its difficult for women go for walking at any time they want or playing sport so they became over weight and obese .

4.13 Body mass Index & F.B.S. relationship

The individuals classified as obese or overweight on BMI., BMI<25 was considered normal, 25-29.9 was overweight and > 30kg/m was obese group. Table (15) shows the percentage of diabetic persons 39.1% in normal group and 60.8% in (obese 32.6% & over weight 28.2%) groups Diabetes mellitus occurred at high percentage in obese & over weight.

tic people were reported as 50% (32%fat 18% over weight) and the other were at normal weight ,at female group the Diabetic people were as 85.7% (35.7%fat, 50% over weight) and 14.3% in normal range from the three tables (15-16-17) Diabetes occurred more in the fat and the overweight groups more than normal one , and its an evidence that obesity is a serious risk factor for assurance of Diabetes 2

4.14 Education & FBS

There was no statistically significant between education & FBS in this study but in Harvard university there are many study indicate that education people have more awareness & percentage of Diabetic people become less in educated people. Variables with no significance in our study were: education & F.B.S relationship. In Harvard university, it was found that there is relation between the educated people and the appearance of the disease its decrease the % (Rubin Rj, 1994) Education it mean not only school or university but also health education about health and how we can prevent many chronic diseases with some knowledge about the risk factors for each disease. In USA there are so many center for prevention chronic diseases and also educational programs at all schools universities even companies for identifying the disease and its risks factors ,so there we find decrease in percentage in incidence rate while in Palestine we have nothing to educate people as national programs or center for chronic diseases.

- This is the first study to identify the risk factors that affect appearance of NIDDM among adult people in Nablus city.

- People with higher than average risk for type 2 diabetes are those who are: over weight and obese and people who are not physically active.

- **Risk factors that help developing the disease are:**

- Being over weight (body mass index of more than 25) carrying fat around waist and stomach

- Having high blood pressure.

- Increasing age is also related to risk.

- The wrong dietary habits, which have high consumption of carbohydrates and fats, help in appearance of type 2 diabetes.

- Smoking also is related to risk.

- Positive association between NIDDM and age, BMI, HTN, type of work, sport, food and smoking, risk factors for the type 2 diabetes are easy to control.

-

4.16.Recommendation:

- During this study, we tried to identify the risk factors that affect appearance of NIDDM between the adult people in Nablus city.

r weight is related to a higher risk of

diabetes, so losing weight cuts risk.

- People can cut their risk of type 2 diabetes nearly in half by making a total of hour of moderate- intensity activity each day, the activity can come from a variety sources through out the day: walking to the work in the morning- talking the stairs at work or home. It does not matter how you get your exercise, just that you get it .

- Change our lifestyle by: (healthy diet, moderate physical activity of 30 minutes a day 5 a week.) Further studies for NIDDM, its complication and, prevention.

- -For employers without diabetes or those with diabetes II we recommended the following steps:

- Provide encouragement and opportunities for all employees to adopt healthier lifestyles that reduce risk for chronic diseases.

- Blood test performed to employees at no cost.

- Once a month diabetes education by health educator including meal planning, nutrition, exercise, medication. Strategies for preventing, complication,and stress management.

managing and controlling diabetes include community support, individual counseling and education, group education complications, and routine follow-up.

- In our country we hope to have a center for chronic disease prevention and health promotion to decrease the incidence of many disease specially type 2 diabetes with National Diabetes Education Program..

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الملخص

يوجد اكثر من 14 مليون أمريكي مصابون بالمرض فى الولايات المتحـدة الامريكيـه،

وهذا يؤدى إلى مضاعفات منها العمى أو أمراض الكلى وكذلك مراض الأعصـاب وامـراض

القلب. الأشخاص الذين لديهم استعداد اكثر للاصا به بالنوع الثاني من مرض السكري هم الذين

يعانون من زيادة بالوزن والذين لا يمارسون أي نوع من الرياضة خلال حياتهم اليومية.

لقد تم اخذ عينه من 317 رجل وامرأة من مدينه نابلس في فلسطين من هم اكثر من 35

سنه، ويعلمون بأنهم غير مصابين بالمرض تم فحص السكر بالـدم واخـذ القياسـات وتعبئـه

البيانات وتحليلها .

النتائج كانت تشابه نتائج الدراسات في البلدان المجاورة وفى العالم .

من أهم هذه النتائج:

* كل من ظهر معهم المرض لم يكونوا يعرفوا انهم مصابون به .

* لقد كان واضح العلاقة بين ظهور المرض ونوع الحياة والغذاء الذي يتناوله الفرد.

* ظهر المرض بنسبه الضعف فى الذكور عن الإناث .

* لم يكن يوجد فرق بالمعلومات عن المرض بين المتعلمين أو الأقل تعليم.

* كل الدراسات تؤكد امكانيه الوقايه من المرض .

جامعه النجاح الوطنيه

كليه الدراسات العليا

استبيان خاص لتقصى عوامل الخطر المتعلقة بظهور مرض السكري فى المجتمع الفلسطيني

القياسات: (   )

الطول(سم):   (   )

الوزن(كغم):   (   )

كتلة الجسم (الوزن/ الطول) بالمتر: (   )

فحص F.B.S :   (   )

1- العمر:

2- الجنس: أ- ذكر

ب- انثى

3- عدد سنوات الدراسة:

4- الحالة الاجتماعية: أ- متزوج

ب- أعزب

5- يعيش بمفرده: (   )

يعيش مع العائلة   (   )

6- مكان السكن: مدينة (   )   قرية (   )   مخيم (   )

7- **هل هو / هي مدخن:**   نعم ( )   لا ( )

اذا نعم : سجائر ( )   او نرجيلة ( )

اذا سجائر :

– ما عدد السجائر باليوم: ( )

– عدد سنوات التدخين: ( )

اذا نرجيلة :

– عدد الانفاس يومياً : ( )

– عدد سنوات التدخين: ( )

اذا مدخن سابق:

– عدد السجائر يومياً: ( )

– عدد الانفاس يومياً: ( )

– عدد سنوات التدخين: ( )

8- **هل لديك امراض اخرى مزمنة :**

– ضغط ( )

– قلب   ( )

طبيعة الحياة :

المهنة :

9- **كيف تصنف طبيعة العمل الفيزيائي الذي يقوم به هل هو:**

1 _____ 5 _____ 10

مكتبي: (   )

عمل خفيف غير متعب : (   )

شاق ومتعب: (   )

10- **هل يمارس الرياضة** : نعم (   )   لا (   )   سابقاً (   )

11- **منذ متى يمارسها:**

12- **كم عدد الساعات التي يمارس بها الرياضة اسبوعياً:**

13- **ماذا تفعل في وقت الفراغ :**

أ- تمارس رياضة المشي   (   )

ب- تشاهد التلفاز   (   )

ج- الذهاب لزيارة صديق   (   )

14-ما تم تناوله قبل 24 ساعة

العشاء		الغذاء		الافطار	
الكمية	الصنف	الكمية	الصنف	الكمية	الصنف