STUDY OF HEALTH RISK BEHAVIORS AMONG SCIENTIFIC PROFESSIONALS

Thesis

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Introduction

Scientific professionals are always in a competition to provide update researches and achieve higher scientific degree. So that their characteristic personality make them at risk for many health problems especially if associated with unhealthy life style and health-risk behavior

The actual causes of the diseases such as heart diseases, cancer and stroke-and therefore the underlying causes of death due these diseases- are often behaviors which can be changed **(David, 2003).**

Priority health-risk behaviors, which contribute to the leading causes of morbidity and mortality among youth and adults, often are established during youth, extend into adulthood, are interrelated, and are preventable **(Grunbaum, et al, 2004).**

The most common such behaviors include:

- Smoking and other forms of tobacco use.
- Eating high-fat and low-fiber foods.
- Not engaging in enough physical activity.
- Abusing alcohol or other drugs.
- Not availing of proven medical methods for preventing disease or diagnosing disease early (e.g., flu shots, Pap smears, mammograms, colonoscopies).
- Engaging in violent behavior or behavior that may cause unintentional injuries (e.g., driving while intoxicated) **(BRFSS, 2001).**

High-risk behaviors and lack of preventive care are associated with higher rates of morbidity and mortality allover the world. Without continued monitoring of these factors, it will be difficult to track and evaluate progress toward Healthy People 2010 and their own objectives **(Ahluwalia, et al, 2003).**

For examples, the health hazards of smoking are important and well established. Diseases that are more common in smokers than in the general population include lung cancer, other lung disease, and cardiovascular diseases .Over 20% of deaths in united states are attributable to tobacco use. So, they consider it the chief preventable cause of death **(Matress,1998).**

Over weight or obesity acquired during childhood or adolescence usually persists into adulthood and increase the risk for cardiovascular disease ,cancer and other chronic diseases, Among adolescents ,obesity is associated with a

variety of adverse physical ,psychological and social consequences **(Kaelin, 1997).**

Regular physical activity has multiple, immediate and long term health benefits .Lack of physical activity is a major risk factor for chronic disease and premature death including cardiovascular disease, diabetes and colon cancer **(Health risk behavior survey, 2002).**

Injuries affect everyone regardless of age, gender, race or economic status. In Colorado, injuries are the third leading cause of death **(Thurman, 1995).**

Stress in the workplace is responsible for much psychological and physical ill-health as cardiovascular diseases, mental problem, lack of sleep, loss of resistance to illness and even allergy **(Fletcher, 1993).**

Continued health improvement will depend largely on changes in individual behavior **(Kimball, et al, 1996)**and Substantial efforts are needed to prevent or reduce health risk behaviors among adolescents and adults **(Nelson, et al, 1997),** So, there is a growing need for collecting data about disease risk factors and protective behaviors of various chronic diseases among different population **(Giuliano, et al 1998).**

Monitoring chronic disease-related behaviors is also key to developing targeted education and intervention programs at the national, state, and local levels to improve the health of the public **(Ahluwalia, et al, 2003).**

The best way to prevent premature death and disease is not high technology medicine, although it, too, has a role. The best way is simple, technology-free behavior change **(David, 2003).**

However, data on prevalence of health risk behaviors among scientific professionals are lacking. This highlight the importance of studying health risk behaviors among the scientific professional as the more they have healthy lifestyle, they will have healthy status, the more they will do well in their scientific work.

Aim of the work

1-To detect the prevalence of heath risk behaviors among scientific professionals at NRC.

2-To study their knowledge, attitude and practice towards different health risk behaviors.

3-To find possible relation between their medical history and some of the studied risk behaviors.

4- To plan intervention programs for modification of the scientific professionals' life style at NRC.

Review of literature

Modifiable behavioral risk factors are leading causes of mortality in the developed countries. The leading causes of death in 2000 were tobacco (435 000 deaths; 18.1% of total US deaths), poor diet and physical inactivity (400 000 deaths; 16.6%), and alcohol consumption (85 000 deaths; 3.5%). Other actual causes of death were microbial agents, toxic agents, and motor vehicle crashes, incidents involving firearms, sexual behaviors, and illicit use of drugs.

These analyses show that smoking remains the leading cause of mortality. However, poor diet and physical inactivity may soon overtake tobacco as the leading cause of death. These findings, along with escalating health care costs and aging population, argue persuasively that the need to establish a more preventive orientation in the health care and public health systems has become more urgent **(Molded, et al, 2004).**

Overweight, drinking and driving, inadequate fruit and vegetable consumption, physical inactivity, and smoking are associated with the development of many diseases and injuries. Some diseases are strongly associated with a particular health risk (e.g., lung cancer's association with cigarette smoking). Other disease etiologies are multifactor, with each health risk contributing additional risk of disease occurrence (e.g., the combined effects of smoking, physical inactivity, excess bodyweight, and poor diet on cardiovascular disease). This multifactor nature can result in confounding of one health risk by another because persons who have one health risk are more likely to have another. (**Serdula, et al, 1996**).

1-Cigarette Smoking behavior

In Egypt in 1997, the prevalence of smoking was 43.4% among adult men and 4.7% among women **(Omar, 1997)**.

The Egyptian ministry of health (2000) reported that 13 million Egyptians are current smokers and the rate of cigarettes consumption has increased by about 24.3% from 1990 to 1997.

In United Kingdom in1997, more than 11 million adults –about 27%of the adult population- were regular smokers with about the same proportion of men and women **(Office for national statistics, 2000).**

Who (2002) has reported that about one third of the men allover the world are smokers.

In general, Smoking may be the gateway to an unhealthy lifestyle**. (Pratalla, et al, 1994)**.

Cigarette smoking is the single most preventable cause of disease and death in the United States. Smoking results in more deaths each year in the United States than AIDS, alcohol, cocaine, heroin, homicide, suicide, motor vehicle crashes, and fires—combined **(Healthy people 2010 objectives, 2000).**

Factors affecting tobacco use

There are four stages in the course of a smoker's career. Initiation, maintenance and cessation are the standard three and relapse has been added because it is such a frequent occurrence. It can be concluded that psychological factors are the determinant of starting to smoke. The pharmacological effects of nicotine, however, are crucial in the continuation of smoking, along with learned psychological factors **(Nielsen and Hogue, 1999).**

Many environmental and behavioral factors especially social stress are important influences of initiation, pattern of use, quitting and relapse to use of tobacco and as well as other addicting drugs e.g. alcohol, heroin and cocaine.

Stress increases cigarette consumption among smokers. Further, stress has been identified as a risk factor for initiation of smoking in adolescence. After smoking cigarettes, a smoker gains improved concentration and mood and decreased anger thus may promote tobacco dependence. However, smoking and nicotine do not improve learning abilities among smokers **(American psychiatric association, 1996).**

High stress for both men and women is associated with cigarette smoking, recent increases in smoking behavior, less self-efficacy to quit smoking, and less self-efficacy to not smoke when stressed **(NG and Jeffery, 2003).**

Individuals with past depressive symptoms are more likely to smoke cigarettes (despite making more attempts to quit smoking) **(Green and Pope, 2000).**

As regard socioeconomic standard (SES), higher SES persons are less likely to smoke and more likely to exercise and eat fruit and vegetables daily. Lower SES is associated with less health consciousness (thinking about things to do to keep healthy), stronger beliefs in the influence of chance on health, less thinking about the future, and lower life expectancies. These attitudinal factors are in turn associated with unhealthy behavioral choices, independently of age, sex, and self rated health **(Wardle and Steptoe, 2003).**

According to **Lahelma (1997)** study, Unemployed men and women were more often smokers than employed persons were.

The higher the education level, the better the health and the more favorable the health behavior. **Healthy People 2010 program (2000)** reported that the percentage of people aged 25 years and older with less than 12 years of education who are current smokers is nearly three times that for persons with 16 or more years of education.

Health hazards of smoking

The Australian Bureau of statistics (1991) classified proportion of deaths by disease group relevant to smoking as follows:

1-Lung cancer (27%) 2-heart disease (24%):

3-chronic bronchitis and emphysema (23%):

4- Other circulatory (15%) 5-other cancers 8% 6-0thers (3%)

1-Smoking and cardiovascular system

a- Coronary heart disease: Coronary heart disease is the largest single cause of death for men and women causing more than one death every 20 minutes or 24.1% of all deaths. Smoking is one of the major risks for heart attack. The risk of developing CHD increases with prolonged and increased intensity of exposure to cigarette smoke. Overall, smokers have a 70% greater rate of mortality from CHD than non-smokers. Smokers consuming more than 40 cigarettes per day have mortality rates between two and three times greater than non-smokers.

Among people less than 65 years of age, 45% of CHD in men and 40% in women are caused by cigarette smoking. Around half of all deaths from CHD happen without warning. Smokers are three times more likely to die suddenly because of CHD than non-smokers. In some cases, this sudden death is caused by ventricular fibrillation, which prevents the heart from beating effectively **(CDC, 1997)**.

b- Cerebrovascular diseases: Smoking is a major contributing factor to both hemorrhagic and ischemic cerebrovascular diseases. Among people aging less than 65 years old ,44% of strokes in men and 39% in women are caused by cigarette smoking **(Shinton and beevers,1989).**

c- Peripheral vascular diseases: Impaired circulation due to nicotine constricting blood vessels leads to peripheral ischemia and increase risk of amputations among smokers **(ASH, 2002).**

2- Smoking and respiratory system

Chronic bronchitis and emphysema: Cigarette smoking is the major cause of 80-90 percent of chronic obstructive lung disease morbidity and mortality in the U.S. In older age groups, mild to moderate emphysema is present in most smokers and rare in nonsmokers. The severity of emphysema among smokers increases with the number of cigarettes smoked per day and the duration of the smoking habit. Smokers have a higher frequency of respiratory system problems (cough, phlegm, wheezing) and a steeper decline in lung expiratory airflow with increasing age **(ASH, 2002**).

3- Smoking and cancer

a- Lung cancer: Of the largest single category of cancer deaths is lung cancer and 80-90 percent of the 130,000 annual deaths are caused by smoking. A smoker increases his risk of getting lung cancer 900 percent (10 times), and a heavy smoker increases his risk over 1400 percent (15-25 times the risk). The five-year survival rate for lung cancer is only 10 percent, among the lowest for all cancers. Smoking also greatly multiplies the chances of contracting lung cancer if the smoker is also exposed to other substances such as asbestos, coal dust, cotton dust, sawdust, heavy metals, and other industrial contaminants. For example, a smoker who is also exposed to asbestos increases his risk of contracting lung cancer nearly 60 times **(ASH, 2002).**

b-Other cancers: smoking increases the risk of oral, laryngeal, esophageal, renal, bladder, pancreatic, stomach and cervical cancers **(A report of surgeon general, 1990).**

4- Smoking and digestive system

Smoking has been shown to have harmful effects on all parts of the digestive system, contributing to such common disorders as heartburn and peptic ulcers. It also increases the risk of Crohn disease and possibly the gallstones. Smoking seems to affect the liver by changing the way it handles drugs and alcohol. In fact, there seems to be enough evidence to stop smoking solely based on digestive distress. **(The report of the US environmental protection agency, 1999)**

5-Smoking and erectile dysfunction in men

Smoking increases the risk of erectile dysfunction by around 50% for men in their 30s and 40s. DM, high cholesterol level and drugs used to treat high blood pressure are also important risk factors **(Whitehead, 1990).**

6- Smoking and infections

Smoking and physical inactivity were considered by **Leveille, et al (2000)** as independent predictors of serious infections that required hospitalization in postmenopausal women aged 55-80 years. These associations were independent of age, body mass index, functional status, and other measures of health.

7-Maternal smoking and pregnancy outcome

The incidence of low-birth weight (less than 2500g) in infant born to smoker females is twice that in infants born to nonsmokers. The relation between maternal smoking and low-birth weight is dose dependant and independent of other factors known to affect birth weight, including race, parity, maternal body built, socioeconomic status, and gestational age. Preterm delivery is associated with maternal smoking (relative risk of 1.5). Maternal smoking is associated with higher fetal, neonatal and infant mortality, independence of sociodemographic factors for such mortality. Some data support the association between smoking and increased risk of spontaneous abortion **(A report of the surgeon general, 1989).**

Other adverse effects of smoking include chronic cough, asthma, kidney and liver damage, diarrhea, arthritis, decrease athletic performance, longer recovery period after surgical operation, tooth decay, yellowish staining of teeth, bad breath, wrinkles , decrease work performance, increase work absents and increase risk of fire accident **(ASH, 2002).**

8-Passive Smoking (Environmental Tobacco Smoke)

Exposure to Environmental Tobacco Smoke (ETS) or secondhand smoke, among nonsmokers is widespread. Home and workplace environments are major sources of exposure. About 15 million children are estimated to have been exposed to secondhand smoke in their homes in 1996. ETS increases the risk of heart disease and respiratory infections in children and is responsible for an estimated 3,000 cancer deaths of adult nonsmokers **(Healthy people 2010 objectives, 2000).**

An Egyptian study stressed on the link between passive smoking and adverse effects on utero-placental homodynamic, which is the main cause of the low-birth weight **(El Wassif, et al, 2000).**

Shehata, et al (1997) studied the effects of variable degrees of exposure to ETS during pregnancy in 152 non-smoking pregnant females. Based on questionnaire filled by parents, newborn were classified into five groups depending on degree of exposure. Birth weight of babies born to mother significantly exposed to tobacco smoke was 230 gm less than those born to non-exposed mothers. It was concluded that passive smoking has a negative influence on intrauterine fetal growth and duration of exposure is more important than the intense of exposure.

There is no safe tobacco alternative to cigarettes. Spit tobacco (chew) causes cancer of the mouth, inflammation of the gums, and tooth loss. Cigar smoking causes cancer of the mouth, throat, and lungs and can increase the risk of heart disease and chronic lung problems **(Healthy people 2010 objectives, 2000).**

The Cost of Tobacco use

Smoking is costly to employers both in terms of smoking-related medical expenses and lost productivity. Ten percent of smokers alive today are living with a smoking-related illness **(CDC, 2003).**

Men who smoke incur $15,800 more in lifetime medical expenses and are absent from work 4 days more per year than men who do not smoke. **(Warner, et al, 1996).** Women who smoke incur $17,500 (in 2002 dollars) more in lifetime medical expenses and are absent from work 2 days more each year than nonsmoking **(Hodgson, 1992).**

Tobacco use is the single most costly health risk behavior today .In 1998, nearly 14% of all Medicaid expenditures in Arkansas, a total of dollars 189 million, were spent on smoking-related illnesses **(Sheffer and O'Bannon, 2004).**

The annual medical costs related to tobacco use are at least $50 billion. Tobacco-related deaths number more than 430,000 per year among U.S. adults, representing more than 5 million years of potential life lost **(CDC, 2004).**

On average, smokers loose about 11 minutes of life every cigarette they smoked, In comparison to non smokers, smokers live many years less as the smoking reduces their life expectancy on average by about 5.4 hours daily and 167.2 days each year **(The smoker aid program, 2002).**

Smoking cessation

Smoking is the leading preventable cause of death in the United States. **(McGinnis and Foege, 1993).** Smokers who quit will, on average, live longer and have fewer years living with disability **(Nusselder, et al, 2000).**

Smokers who are aware of the drawbacks of cigarettes have greater chances of successfully quitting smoking **(The smoker aid program, 2002).**

There is an evidence that the data on health consequences of smoking have affected the attitude of those who continue to smoke, according to Husten

survey, (1995-1996) 68% of current smokers want to quit completely and 46% of current daily smoker report making at least one serious attempt to quit **(Husten, et al, 1996).**

Most people who smoke are aware of the dangers and would be disposed to try to stop if effective and efficient help were available **(Jonathan, et al, 1998).**

About 23% of American adults and 28% of teens smoke. More than 70% want to quit, but few succeed without help **(CDC, 2002)**.

Tobacco use treatment doubles the quitting success rates (**Fiore, et al, 2000).**

Why it is so difficult for so many to stop?

The decision to quit and success in so doing is largely a psychological matter. The relapse of smoking is a phenomenon about which we know relatively little, but it appears that stress and social pressure are the most known factors **(Nielsen and Hogue, 1999).**

A more detailed description of the factors maintaining smoking can deepen one, s appreciation of the tenacity of the behavior. Such an appreciation is critical for the design of effective programs, and can suggest realistic expectation for program outcomes.

1- Smoking delivers nicotine to the brain very quickly, in about seven seconds. Many smokers, especially heavy smokers, appear to smoke in such a way as to regulate their dosage of nicotine.

2-A second consideration is that smoking is possible under a wide variety of circumstances and sittings. These numerous settings become signals to smoke, and often-latter come to serve as learned rewards for smoking. Situation in which smoking occurs repeatedly, such as when drinking coffee or tea, or conversing with another smoker, come to serve as signals to smoke. An urge is subjectively experienced when these situations are encountered.

3- While there are numerous immediate positive rewards, the negative consequences are delayed and probabilistic.

4- Another significant factor in the tenacity of the smoking habit is sheer number of trials, or practice. Twenty cigarettes a day adds up to about 7,300 cigarettes a year. Each trial, in fact each puff, is an occasion for experiencing one or more of the rewards just noted.

5-A fifth factor is the encouragement and modeling of smoking provided by the environment in the form of other smokers as well as cigarette advertising. **(Schachter, 1978)**

The intervention of Smoking cessation

Levels of intervention: Smoking cessation program can be mounted at various levels of intensity and cost:

a- Community wide approaches-low cost efforts such as media campaigns to stop smoking

b- Time-limited group programs for those needing structured program.

c- Intensive programs-individual counseling for those not profiting from the others or in need for extended treatment because of smoking related illness. Besides these levels, smoking cessation workers should give particular attention for three settings: schools, work places and health care settings **(Rosen and Lichtenstein, 1977).**

What treatments are available? How effective are they?

Paying for cessation treatments is the single most cost-effective health insurance benefit for adults that can be provided to employees **(Coffield, et al, 2001)**.

Scientifically proven treatments can double a person's chances of quitting smoking. Smoking cessation treatments have been found to be safe and effective. These include counseling and medications, or a combination of both **(Fiore et al, 2000).**

I-Counseling: Face-to-face counseling and interactive telephone counseling are more effective than services that only provide educational or self-help materials **(McAfee et al, 1998).** The effectiveness of counseling services increases as their intensity (the number and length of sessions) increases. **(Fiore et al, 2000)** Smokers are more likely to use telephone counseling than to participate in individual or group counseling sessions **(McAfee, et al, 2002).**

II- medications: The Food and Drug Administration has approved six first-line medications to help smokers quit. Five are nicotine replacement therapies that relieve withdrawal symptoms. They include nicotine gum, patch, nasal spray, inhaler, and lozenge.

The sixth medication, bupropion SR (sustained release), is a non-nicotine medication that is thought to reduce the urge to smoke by affecting the same

chemical messengers in the brain that are affected by nicotine **(Fiore, et al, 2000).**

Table 1: Prescription and Over-the-Counter Tobacco Cessation Medications*

Type	Form	Common Brand Name(s)	Availability
Nicotine Replacement Therapy	Gum	Nicorette®	Over-the-counter (OTC)
	Patch	Nicoderm®, Habitrol®, Prostep®, Nicotrol®	OTC and prescription
	Inhaler	Nicotrol®	Prescription
	Nasal Spray	Nicotrol®	Prescription
	Lozenge	Commit®	OTC
Bupropion SR	Pill	Zyban®, Wellbutrin®	Prescription

Approved by the Food and Drug Administration (FDA) and addressed in the 2000 PHS Guidelines.

According to **the smokers aid program(2002**) 9 out of 10 daily smokers are nicotine dependant, when quitting they feel many withdrawal symptoms.

Irresistible urge to smoke, anxiety, irritability, nervousness, headache, restlessness, increased appetite, depressed mood, difficulty concentrating, frustration or anger and difficulty sleeping are among nicotine withdrawal symptoms **(Hughes,1986).**

Nicotine replacement therapies, by relieving withdrawal symptoms increase the chance of quit by two to three times **(Smokers aid program 2002).**

2-Dietary Habits and Physical Activity

Eating too many calories and not getting enough physical activity leads to energy imbalance, which is the key for overweight, and obesity.

Unhealthy diet and physical inactivity encourage excess weight gain and are major risk factors in many chronic diseases and conditions, including type 2

diabetes, hypertension, heart disease, stroke, breast cancer, colon cancer, gallbladder disease, and arthritis (**CDC , Physical activity and good nutrition,2004**).

Overweight and Obesity

Obesity is an important public health problem. Through out this century, the prevalence of obesity has increased gradually but a sharp increase has occurred in the last 10 years, Thus obesity has reached epidemic proportion. Obesity in the United States is truly epidemic. In the last 10 years, obesity rates have increased by more than 60% among adults. Approximately 59 million adults are obese **(CDC, Physical activity and good nutrition, 2004).**

Iin Egypt, the prevalence of obesity in adults is very high, particularly among women. The prevalences of diabetes mellitus and of hypertension parallel that of obesity, and both are very high. Little information is available on physical activity, but it is likely that a large proportion of the population is quite sedentary, particularly in the cities. Public awareness of the increasing prevalence of obesity and of diet-related chronic disease is increasing, and attention has turned to documenting the problem(s) **(GALAL, 2002)**

Obesity is epidemic among all segments of the population and in all regions, and obese persons are at higher risk for several chronic diseases **(Office of the Surgeon General, 2001)**

Overweight and obesity are major contributors to many preventable causes of death. On average, higher body weights are associated with higher death rates. The number of overweight children, adolescents, and adults has risen over the past four decades (**Healthy people 2010 objectives**, 2000).

Assessment of Weight and Body Fat **(NHLBI, 2002)**

There are two measures important for assessing overweight and total body fat content, determining body mass index (BMI) and measuring waist circumference.

Body Mass Index: In recent years, BMI has become the medical standard used to measure overweight and obesity and to monitor changes in body weight. It describes relative weight for height and is significantly correlated with total body fat content. Measurements of body weight alone can be used to determine efficacy of weight loss therapy. BMI uses a mathematical formula based on a person's height and weight.

BMI is calculated as weight (kg)/height squared (m^2). To estimate BMI using pounds and inches, use [weight (pounds)/height (inches)^2] x 703.

Table 2: Classification of Overweight and Obesity by BMI

	Obesity Class	BMI (kg/m^2)
Underweight		<18.5
Normal		18.5-24.9
Overweight		25.0-29.9
Obesity	I	30.0-34.9
	II	35.0-39.9
Extreme Obesity	III	≥40

Waist Circumference: The presence of excess fat in the abdomen out of proportion to total body fat is an independent predictor of risk factors and morbidity. Waist circumference is positively correlated with abdominal fat content. It provides a clinically acceptable measurement for assessing a patient's abdominal fat content before and during weight loss treatment. The waist circumference at which there is an increased relative risk is defined as follows:

High Risk
Men: >102 cm (>40 in.)
Women: >88 cm (>35 in.)

Lifestyle risk factors for obesity

Obesity is a result of a complex variety of social, behavioral, cultural, environmental, physiological, and genetic factors. Efforts to maintain a healthy weight should start early in childhood and continue throughout adulthood. This is likely to be more successful than efforts to lose substantial amounts of weight and maintain weight loss once obesity is established **(Healthy people 2010 objectives, 2000)**

Body weight is the result of genes, metabolism, behavior, environment, culture, and socioeconomic status. Behavior and environment play a large role causing people to be overweight and obese. These are the greatest areas for prevention and treatment actions **(Office of the Surgeon General, 2001).**

I-Positive associations:

Recent increases in the prevalence of obesity worldwide are suggested to be caused largely by an environment that promotes sedentariness and excessive food intake.

As regard food choices, a study was done by **Lahti-Koski, et al (2002)** among women in Finland which suggested that increased consumption of certain types of food such as sausages, milk, and sour milk are positively associated with obesity, thus BMI is affected by food choices as well as food amount. Obesity is also associated with alcohol consumption and smoking history. According to **Kahn, et al, 1997** prospective study, ten-years changes in body mass index among white non-Hispanic healthy adults (from 1982 to 1992) were associated positively with meat consumption and smoking cessation.

Sociodemographic factors affect obesity pattern of body weight. Previously identified risk factors for obesity among adults include having a low income (among women) ,low education level, being aged >45 years or being a member of certain racial/ethnic populations, and not being physically active or not eating the recommended amount of fruits and vegetables daily **(Office of the Surgeon General, 2001).**

Increased food insecurity (i.e., not having access at all times to enough safe and nutritious food for an active, healthy lifestyle because such foods are not available consistently or household resources are insufficient to meet the cost) is associated with increasing obesity.

Previous studies have suggested a possible relation between obesity and food insecurity **(Nord, 2002).** Diet of food-insecure women includes fewer fruits and vegetables **(Olson , 1999).**

Obesity include periods of both under- and over consumption, physiologic adaptation of increased body fat in response to episodic food shortages, and higher consumption of cheaper foods that are higher in fat These, explain the possible association between food insecurity and obesity. Studies of dieters, prisoners of war, and children with food-restrictive parents indicate that food deprivation can lead to over consumption of foods restricted previously after the restriction ends **(Adams, 2003).**

Fast food consumption and TV viewing hours are two recent trends in the modern life style suggest themselves as possible contributors to recent trends in obesity, possibly, by making eating more attractive and physical activity less so.

According to **Robert, et al, 1998** study that examined the association between TV viewing, fast food, and BMI, television viewing is inversely associated with intake of fruit and vegetables among adolescents. These associations may

be a result of the replacement of fruits and vegetables in youths' diets by foods highly advertised on television.

Boynton-Jarrett, et al, 2003 have found that for each additional hour of television viewed per day, fruit and vegetable servings per day decreased (-0.14) after adjustment for anthropometric, demographic, dietary variables (including baseline percent energy from fat, sit-down dinner frequency, and baseline energy-adjusted fruit and vegetable intake), and physical activity. Baseline hours of television viewed per day was also independently associated with change in fruit and vegetable servings (-0.16).

II-Inverse associations:

A physically active lifestyle with abstention from smoking, moderate alcohol consumption, and consumption of healthy foods maximizes the chances of having a normal weight. **Lahti-Koski, et al (2002)** study demonstrated the significance of avoiding sedentariness as a factor associated with normal weight and that significant relations increase over time. Obesity is inversely associated with perceived general health, leisure-time physical activity, and daily vegetable consumption.

Weight gain is inversely associated with vegetable consumption, vitamin E supplementation, continued smoking, walking 4 or more hours per week, and some vigorous activities (jogging/running 1 to 3 hours per week) but not with less demanding physical activities. Decreasing BMI with walking four or more hours per week and with regular alcohol intake is more observed in women but these behaviors have a smaller effect on men's BMI **(Kahn et al 1997).**

Overweight and Obesity Health Consequences

Overweight and obese individuals (BMI of 25 and above) are at increased risk for physical ailments such as: (**Mokdad et al, 2001)**

- High blood pressure (hypertension)
- High blood cholesterol (dyslipidemia)
- Type 2 (non-insulin dependent) diabetes
- Insulin resistance, glucose intolerance
- Hyperinsulinemia
- Coronary heart disease
- Angina pectoris
- Congestive heart failure
- Stroke
- Gallstones

- Cholescystitis and cholelithiasis
- Gout
- Osteoarthritis
- Obstructive sleep apnea and respiratory problems
- Some types of cancer (such as endometrial, breast, prostate, and colon)
- Complications of pregnancy such as; gestational diabetes, gestational hypertension and preeclampsia as well as complications in operative delivery (i.e., c-sections).
- Poor female reproductive health (such as menstrual irregularities, infertility, irregular ovulation)
- Bladder control problems (such as stress incontinence)
- Uric acid nephrolithiasis
- Psychological disorders (such as depression, eating disorders, distorted body image, and low self-esteem).

Overweight and obesity substantially raise the risk of illness from high blood pressure, high cholesterol, type 2 diabetes, heart disease and stroke, gallbladder disease, arthritis, sleep disturbances and problems breathing, and certain types of cancers. Obese individuals also may suffer from social stigmatization, discrimination, and lowered self-stemming**. (Healthy people 2010 objectives,2000)**

Goins et al, 2003 has reported that obese elderly Appalachians reported poorer self-rated health and more days of poor physical health compared with their non-obese counterparts The Healthy People 2010 goals include the reduction of obesity and enhancement of quality of life.

Weight loss :

Compared to intentional weight losers, Unintentional weight loss may be part of a cluster of behaviors that have a negative health impact. Those who lost their weight unintentionally reported engaging in more negative health behaviors that are related to disease morbidity and mortality.

According to **McGuire,1999** study, unintentional weight losers had higher levels of smoking and drinking, were less physically active, and were less concerned about their diet and fat intake.

Unintentional weight losers did not report having higher levels of disease such as high blood pressure or diabetes. However, unintentional weight losers who reported having such diseases were more likely to report that their weight loss had worsened their disorder.

Promotion of dietary habits and physical practice

The Dietary Guidelines for Americans recommended that to build a healthy base, persons aged 20 years and older choose a healthful assortment of foods that includes vegetables; fruits; grains (especially whole grains); fat-free or low-fat milk products; and fish, lean meat, poultry, or beans. The guidelines further emphasize the importance of choosing foods that are low in saturated fat and added sugars most of the time and, whatever the food, eating a sensible portion size. It is recognized, however, that this guidance may be particularly challenging when eating out because the consumer may be offered large portion sizes with unknown amounts of saturated fat and added sugars **(Healthy people 2010 objectives, 2000).**

Whole-grain foods have always been considered a healthy part of the diet. Recently, epidemiologic and other data have shown that whole grains have a role in preventing cardiovascular disease, diabetes, some types of cancer, and even obesity. What nearly all consumers and most health professionals fail to realize is that whole grains deliver as many if not more phytochemicals and antioxidants than do fruits and vegetables.

It is recommended to have three servings of whole grains per day and five or more servings of fruits and vegetables each day.Health professionals must mount an active campaign to help consumers better chooses healthy diet increase their intake in the diet **(Jones, et al, 2004).**

The American Public Health Association adopted a policy resolution calling for a 50% reduction in sodium in the nation's food supply over the next 10 years. As the American public consumes far more sodium than is needed (most of which is added by food manufacturers and restaurants), such a reduction would greatly enhance the chances of attaining the Healthy People 2010 objectives and would save at least 150 000 lives annually. **(Havas, et al, 2004)**

The Dietary Guidelines for Americans recommend that all adults be more active throughout the day and get at least 30 minutes of moderate physical activity most, or preferably all, days of the week. Adults who are trying to maintain healthy weight after weight loss are advised to get even more physical activity.

The guidelines also recommend that children get at least 60 minutes of physical activity daily and limit inactive forms of play such as television watching and computer games. Increase the proportion of adults who engage regularly, preferably daily, in moderate physical activity for at least 30 minutes per day is one of the most important objectives of Healthy People 2010. .(Healthy people 2010 objectives,2000)

Walking was the most frequently reported activity among adults who met the national recommendations for regular physical activity (defined as five or more times a week for > or =30 minutes per session). Given the acceptability of walking across all sociodemographic subgroups, efforts to increase the frequency of walking could markedly increase the percentage of adults who engage in regular physical activity, a national priority identified in the Healthy People 2010 objectives **(Simpson, et al, 2003).**

Benefits of physical activity

Regular physical activity throughout life is important for maintaining a healthy body, preventing premature death. It also is associated with lower death rates for adults of any age, even when only moderate levels of physical activity are performed.

Regular physical activity decreases the risk of death from heart disease, lowers the risk of developing diabetes, and is associated with a decreased risk of colon cancer. It also helps to prevent high blood pressure and helps reduce blood pressure in persons with elevated levels.

Regular physical activity also increases muscle and bone strength, increases lean muscle and helps decrease body fat. It also aids in weight control and is a key part of any weight loss effort.

Furthermore, it enhances psychological well-being and may even reduce the risk of developing depression. Appears to reduce symptoms of depression and anxiety and to improve mood

In addition, children and adolescents need weight-bearing exercise for normal skeletal development, and young adults need such exercise to achieve and maintain peak bone mass (**Healthy people 2010 objectives, 2000).**

Older adults can improve and maintain strength and agility with regular physical activity. This can reduce the risk of falling, helping older adults maintain an independent living status. Regular physical activity also increases the ability of people with certain chronic, disabling conditions to perform activities of daily living **(the surgeon general report, 2001).**

Additional health benefits can be gained through greater amounts of physical activity, either by increasing the duration, intensity, or frequency. If 10% of adults began a regular walking program, $5.6 billion in heart disease costs could be saved. Every dollar spent on physical activity programs for older adults with hip fractures results in a $4.50 return. **(CDC, 2003)**

Specific intervention directed at the promotion of physical activity in the population is necessary**.(De Bourdeaudhuij and Van Oost.,1999)**

Weight control

A 10% weight loss will reduce an overweight person's lifetime medical costs by $2,200–$5,300 **(CDC, 2004).**

A practitioner without specialization in weight loss can conduct a weight loss and maintenance program so long as that person has the requisite interest and knowledge. However, various health professionals with different expertise are available and helpful to a practitioner who would like assistance.

The general goals of weight loss and management are:

- To reduce body weight.
- To maintain a lower body weight over the long term.
- To prevent further weight gain.

A healthy diet and regular physical activity are both important for maintaining a healthy weight. Over time, even a small decrease in calories eaten and a small increase in physical activity can help prevent weight gain or facilitate weight loss. It is recommended that obese individuals who are trying to lose substantial amounts of weight seek the guidance of a health care provider **(Healthy people 2010 objectives, 2000).**

Depending on the degree of overweight and the presence of other diseases or risk factors, a patient should be advised to either reduce body weight or prevent further weight gain. All patients with a BMI of 30 or those with a BMI of 25 to 29.9 kg/m^2 (or a high waist circumference) and two or more risk factors should attempt to lose weight. However, it is important to ask the patient whether they want to lose weight. Patients with a BMI of 25 to 29.9 kg/m^2 with one or no risk factors should work on maintaining their current weight and prevent further weight gain. The justification for offering these overweight patients the option of maintaining (rather than losing) weight is that their health risk, while higher than that of persons with a BMI of <25, is only moderately increased.

Evidence indicates that a moderate weight loss can be maintained over time if some form of therapy continues. It is better to maintain a moderate weight loss over a prolonged period than to regain from a marked weight loss **(NHLBI, 2002).**

Obesity prevention interventions should emphasize the importance of using healthy weight-control practices. Adults trying to control their weight reported

healthier nutrient intakes than those not trying to control their weight, particularly when moderate weight-control methods were employed **(Neumark-Sztainer D,2000).**

Dieting behaviors are more prevalent among women than men. Exercise is the most frequently used specific weight loss practice, followed by decreasing fat intake among both genders **(Neumark-Sztainer D,1999).**

By improving eating habits and increasing physical activity, obesity and other chronic diseases can be reduced, that also helps to maintain weight loss, and helps to prevent weight gain. Increasing opportunities for healthy eating, such as making fruits and vegetables more available, will enable people to eat better. Reducing the time spent watching television appears to be effective for treating and preventing obesity. Increasing opportunities for physical activity, including multiuse trails, will help more people be active**.(CDC, physical activity and good Nutrition, 2004)**

3- Alcohol and drug consumption

Alcohol abuse is the third leading preventable cause of death in the United States. A review of morbidity and mortality studies bearing on the hazards to physical health of chronic heavy alcohol use indicates that such use carries a

risk of premature death greatly exceeding normal expectancy. While the life style typical of many heavy drinkers contributes to this risk, the effects of alcohol per se account for a substantial part of the excess mortality. The lowest level of consumption at which there is a significant increase in the death rate has yet to be determined. It is certainly below 120 g/day- the lower limit of consumption of most clinical alcoholics-and quite possibly below 35-60g: levels, which appear to carry an increased likelihood of cirrhosis and certain cancers. **(Schmidt and Popham, 1975)**

Alcohol and illicit drug use are associated with many serious problems, including violence, injury, and HIV infection. The annual economic costs to the United States from alcohol abuse were estimated to be $167 billion in 1995, and the costs from drug abuse were estimated to be $110 billion. **(National Household Survey on Drug Abuse. 1998).**

Binge and heavy drinking increase the risk for cirrhosis, cancer, heart disease, stroke, injury, and depression **(CDC, 2004).**

Long-term heavy drinking can lead to heart disease, cancer, alcohol-related liver disease, and pancreatitis. Alcohol use during pregnancy is known to cause fetal alcohol syndrome, a leading cause of preventable mental retardation. Alcohol and illicit drug use also can result in substantial disruptions in family, work, and personal life **(Healthy people 2010 objectives,2000)**.

4-Accident and Injury

The risk of injury is so great that most persons sustain a significant injury at some time during their lives. Motor vehicle crashes are the most common cause of serious injury. In 1998, there were 15.6 deaths from motor vehicle crashes per 100,000 persons. Nearly 40 percent of traffic fatalities in 1997 were alcohol related. Each year in the United States, it is estimated that more than 120 million episodes of impaired driving occur among adults. In 1996, 21

percent of traffic fatalities of children aged 14 years and under involved alcohol; 60 percent of the time the driver of the car in which the child was a passenger was impaired **(Healthy people 2010 objectives, 2000).**

Risk taking behavior has been identified as an important host-related determinant of injury in young adults. The engagement in injury-related risk behaviors, including alcohol use, is strongly associated with injury status **(Field and O'Keefe, 2004).**

Injury recidivism among trauma patients may be related to an individual pattern of high-risk behaviors. The extent to which an injury episode modifies this behavior pattern is unknown. A survey was administered by Mangus to motorcycle and all-terrain vehicle (ATV) riders at a popular recreation site recorded that Persons with a history of minor or major ATV/motorcycle injury were less likely to use a helmet or protective equipment **(Mangus,2004).**

The relative risk of all accidents and of accidents with injuries is higher for users of wireless telephones than for non-users. The relative risk (RR) for injury collisions and for all collisions is 38% higher for men and women cell phone users than non users. These risks diminish to 1.1 for men and 1.2 for women if other variables, such as the kilometers driven and driving habits are incorporated into the models. Similar results hold for several sub-groups. The most significant finding is a dose-response relationship between the frequency of cell phone use, and crash risks.
The adjusted relative risks for heavy users are at least two compared to those making minimal use of cell phones; the latter show similar collision rates as do the non-users **(Laberge-Nadeau, et al, 2003).**

Motor vehicle crashes are often predictable and preventable. Increased use of safety belts and reductions in driving while impaired are two of the most effective means to reduce the risk of death and serious injury of occupants in motor vehicle crashes **(Healthy people 2010 objectives, 2000)**.

Many injury prevention interventions require changes in human behavior to reduce self-risk or risk to others. Promising injury prevention interventions may be discarded if they lack power to create a significant difference in outcomes when judging their ability to "move a person from non action or negative action to positive action (safety)." **(Kidd, et al, 2003).**

Laboratory injuries

Examples of common laboratory hazards include the following:

- Chemical hazards: Toxins, corrosives, flammables, and reactive
- Biological hazards: Microbes, animals, plants, and genetically modified agents
- Radiation hazards: Ionizing and no ionizing radiation

- Physical hazards: Heating devices, noise, projectiles, fire and cold
- Electrical hazards: Fire and shock
- Mechanical hazards: Moving machinery
- Airborne hazardous materials: Vapors, dust, etc.
- Ergonomic factors: Standing, repetitive motion

Safety conscious workers using good laboratory practices are the most important component of laboratory safety **(Laboratory Safety Guidelines, 1996).**

In the procedure of plant and feed sample preparation and analysis, laboratory workers expose to a variety of health and safety Hazards such as plant dust, noise, toxic chemicals (especially organic solvents), toxic waste gases(CO and SO2), Strong acids and bases, and high temperature procedures **(Kodama and Zhang, 1996).**

The three main health and safety hazards associated with feed analyzers are ethyl ether, an organic solvent hazard in the measurement of crud fat, plant dust hazard and noise hazard in grinding sample according to the extent of exposure and the health effects of laboratory analyzers to all health and safety hazards **(Merchant, 1994).**

Lab workers may be at increased risk for selected cancers such as lymphomas, leukemia, and cancers of the gastrointestinal system. An association between laboratory work and adverse pregnancy outcome is also suggested. Due to the many different chemicals commonly used in laboratories, specific chemicals are unable to be identified as the source of reported health effects in these studies **(Dement et al, 1992).**

5-Job stress

Job stress is defined as the harmful emotional and physical reactions resulting from the interactions between the workers and his/her environment where the demands of the job exceed the worker's capabilities and resources **(European agency for safety and health at work, 2000).** NIOSH has defined work place stress as a threat to the health of workers, and it argues both employers and employees to reduce the risk. A survey of Northwestern National life reported that one-forth of employees view jobs as the first stressor in their lives **(NIOSH, 1999).**

More subtle forms of stress may arise in any workplace because of:

- Unrealistic workloads and deadlines;
- Shift work;
- Long work hours;
- Job insecurity;
- Lack of understanding of the job;

- Lack of control over workload;
- Poor communications between management and employees;
- Hazardous working conditions;
- Working with persons who are sick, injured or dying;
- Handling complaints, dealing with abusive customers;
- Poor job placement;
- Lack of job satisfaction;
- Repetitive, unstimulating tasks.

Most of the above contributing factors are easily rectifiable once the signs and symptoms have been identified. The more obvious forms of stress are severe stress reactions from exposure to trauma and/or violence at work. This is often referred to as critical incident stress. Occupations that see and work with trauma include the paramedical and health care professionals, community care workers, and police and prison officers **(National Occupational Health and Safety Commission,1998).**

When stress serves as a positive motivation, it is considered beneficial as the human body requires physiological arousal to ensure the optimal functioning of several organs including the heart and skeletal system, so it is believed by many that humans need some degree of stress to stay healthy, beyond this optimal point, stress does more harm than good.

There are three types of stress:

1-Eustress : a good stress arises in any situation or circumstances that a person finds motivation or inspiring . Usually, situations that are classified as eustress are enjoyable and for this reason, they not considered a threat.

2-Neustress: describes sensory stimuli that have no consequential effect, it is considered neither bad not good e.g., news of an earthquake in a remote corner of the world might full into this category.

3- Distress: it is the type of stress that brings about negative mental or physical responses. There are two kinds of distress:

Acute stress: quite intense and disappeared quickly.

Chronic stress: not so intense, yet lasts for prolonged periods **(Seward, 1997).**

Reactions to stress

Reactions to stress may involve both physical and psychological symptoms and are very individual responses. Stress may also be related to issues outside the workplace such as personal problems, alcohol, or substance abuse. It may not be obvious when someone is experiencing stress **(National Occupational Health and Safety Commission, 1998).**

Many variables may affect individual vulnerability to occupational stress. Personality structure, family life, stage in life and social support system are among the most important factors affecting the stress response **(Seward, 1997)**.

The association between stress and diseases may be moderated in part by unhealthy behaviors **(NG and Jeffery, 2003).**

Health effects of stress include:

I-Physical conditions:

1- Cardiovascular diseases (coronary artery disease, hypertension, strokes)

2- Gastrointestinal diseases (peptic ulcer, ulcerative colitis, spastic colon)

3-Other chronic diseases (DM, asthma, back pain)

4-Short term conditions e.g.: headaches, stomach problems, over or under eating, sleep disturbances, chronic mild fatigue, muscle aches, skin rashes, teeth grinding, chronic mild illness, sexual dysfunction, diarrhea and constipation)

II-Psychological conditions:

Long-term effects include serious depression, suicidal behavior, accidents, domestic violence, and alcoholism and substances abuse.

Short term effects: forgetfulness, anger, frustration, anxiety, depression, more irritability with family members and co-workers, more use of alcohol or cigarettes, more use of drugs or sleeping pills, feeling powerless and having more problems at work **(Cahill, et al, 1995).**

Behavioral changes may also occur in response to occupational stress. Diminished participation in family activities, increased marital discord and reduced participation in club activities have been attributed to stress. Rates of substances abuse are often increased. Studies have shown increased rates of abuse among individuals with high level of stress and job dissatisfaction **(Weber and reinhand, 2000).**

Tobacco consumption is elevated among people with heavy workloads and tends to increase near deadlines. Other behavioral changes may include

alternations in appetite and eating behavior, risk taking (e.g. when driving) and reduced interest in recreational activities. **(Seward, 1997)**

Stressed workplaces usually have low employee morale, absenteeism and a high frequency of accidents. Do not forget that you too may also experience stress at some time **(National Occupational Health and Safety Commission,1998).**

Behavior change

Although nearly half of the nation's premature deaths are linked with such things as unhealthy diet, inactivity or substance abuse, few managed care plans routinely use proven strategies to help their enrollees change these behaviors.

According to **Centre for advancement of health, 2000,** most medical directors believe health behavior powerfully influences health outcomes. Behavioral health risks are tied to higher ambulatory care and hospitalization costs and account for as much as 70 percent of all medical care spending. However, health plans were reluctant to incorporate behavior change interventions into their systems of care, in part because the cost impact of doing so is unclear. Behavior change efforts should be fragmented within plans for chronic disease management with one set of policies and standards in existence for disease management and another in place for behavioral risk reduction services.

The Transtheoretical Model for behavior change(TTM) (Velicer, et al, 1998)

The Transtheoretical Model is an integrative model of behavior change in which Key constructs from other theories are integrated. The model describes how people modify a problem behavior or acquire a positive behavior. It is a model of intentional change that focuses on the decision making of the individual, Social and biological influences on behavior are viewed within the

context of the Transtheoretical Model as external influences affecting through the individual.

The model has previously been applied to a wide variety of problem behaviors. These include smoking cessation, exercise, low fat diet, radon testing, alcohol abuse, weight control, condom use for HIV protection, organizational change, use of sunscreens to prevent skin cancer, drug abuse, medical compliance, mammography screening, and stress management. The central organizing construct of the model is the Stages of Change. The model also includes a series of independent variables, the Processes of Change, and a series of outcome measures, including the Decisional Balance and the Temptation scales.

A-The Stages of Change:

The Transtheoretical Model construes change as a process involving progress through a series of five stages.

Precontemplation is the stage in which people are not intending to take action in the foreseeable future, usually measured as the next six months. People may be in this stage because they are uninformed or under-informed about the consequences of their behavior. Alternatively, they may have tried to change a number of times and become demoralized about their ability to change. Both groups tend to avoid reading, talking or thinking about their high risk behaviors. They are often characterized in other theories as resistant or unmotivated or as not ready for health promotion programs. The fact is traditional health promotion programs are often not designed for such individuals and are not matched to their needs.

Contemplation is the stage in which people are intending to change in the next six months. They are more aware of the pros of changing but are also acutely aware of the cons. This balance between the costs and benefits of changing can produce profound ambivalence that can keep people stuck in this stage for long periods. We often characterize this phenomenon as chronic contemplation or behavioral procrastination. These people are also not ready for traditional action oriented programs.

Preparation is the stage in which people are intending to take action in the immediate future, usually measured as the next month. They have typically taken some significant action in the past year. These individuals have a plan of action, such as joining a health education class, consulting a counselor, talking

to their physician, buying a self-help book or relying on a self-change approach. These people should be recruited for action-oriented smoking cessation, weight loss, or exercise programs.

Action is the stage in which people have made specific overt modifications in their life-styles within the past six months. Since action is observable, behavior change often has been equated with action. However, in the Transtheoretical Model, Action is only one of five stages. Not all modifications of behavior count as action in this model. People must attain a criterion that scientists and professionals agree is sufficient to reduce risks for disease. In smoking, for example, the field used to count reduction in the number of cigarettes as action, or switching to low tar and nicotine cigarettes. Now the consensus is clear--only total abstinence counts. In the diet area, there is some consensus that less than 30% of calories should be consumed from fat. The Action stage is also the stage where vigilance against relapse is critical.

Maintenance is the stage in which people are working to prevent relapse but they do not apply change processes as frequently as do people in action. They are less tempted to relapse and increasingly more confident that they can continue their change.

Figure1 illustrates how the temporal dimension is represented in the model. Two different concepts are employed. Before the target behavior change occurs, the temporal dimension is conceptualized in terms of behavioral intention. After the behavior change has occurred, the temporal dimension is conceptualized in terms of duration of behavior.

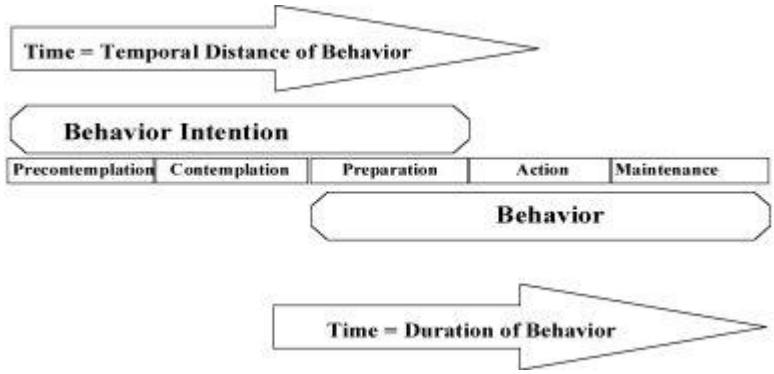

Figure 1. The Temporal Dimension as the Basis for the Stages of Change

Regression and Relapse:

Regression occurs when individuals revert to an earlier stage of change. Relapse is one form of regression, involving regression from Action or Maintenance to an earlier stage. However, people can regress from any stage to an earlier stage. Relapse tends to be the rule when action is taken for most health behavior problems , but for smoking and exercise the vast majority

regress to Contemplating or Preparation, only about 15% of people regress all the way to the Precontemplation stage..

B-Intermediate/Dependent Measures: Determining when Change Occurs

These outcome measures include the Decisional Balance and the Temptation scales.

1-The Decisional Balance scale involves weighting the importance of the Pros and Cons. A predictable pattern has been observed of how the Pros and Cons relate to the stages of change. Figure 2 illustrates this pattern for smoking cessation. In Precontemplation, the Pros of smoking far outweigh the Cons of smoking. In Contemplation, these two scales are equal. In the advanced stages, the Cons outweigh the Pros.

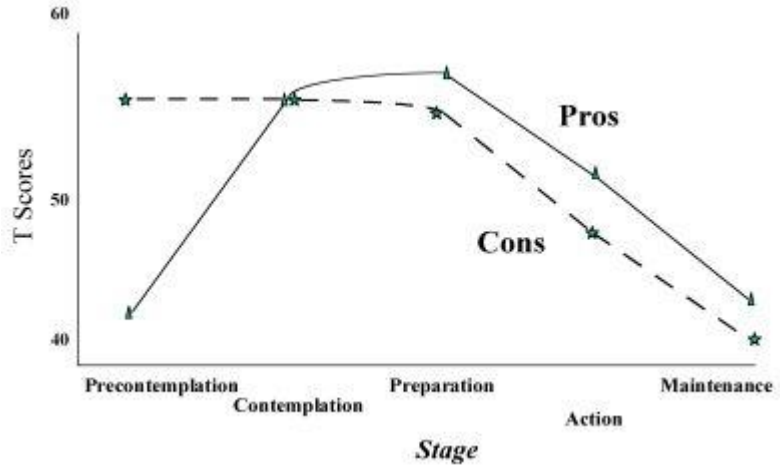

Figure 2. The Relationship between Stage and the Decisional Balance for an Unhealthy Behavior

A different pattern has been observed for the acquisition of healthy behaviors. Figure 3 illustrates this pattern for exercise. The patterns are similar across the first three stages. However, for the last two stages, the Pros of exercising remain high. This probably reflects the fact that maintaining a program of regular exercise requires a continual series of decisions while smoking eventually becomes irrelevant. These two scales capture some of the cognitive changes that are required for progress in the early stages of change.

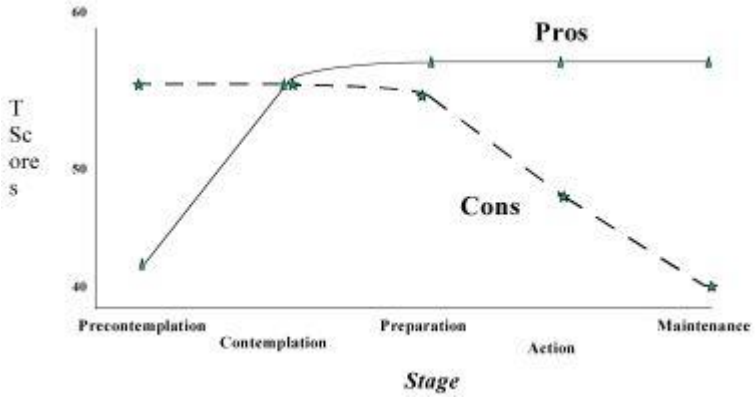

Figure 3. The Relationship between Stage and the Decisional Balance for a Healthy Behavior

2-Self-efficacy/Temptations: The Self-efficacy construct represents the situation specific confidence that people have that they can cope with high-risk situations without relapsing to their unhealthy or high-risk habit. This construct was adapted from Bandura's self-efficacy theory **(Bandura, 1977, 1982).** This construct is represented by either a Temptation measure or a Self-efficacy construct. The Situational Temptation Measure **(DiClemente, 1981, 1986; Velicer, DiClemente, Rossi, & Prochaska, 1990)** reflects the intensity of urges to engage in a specific behavior when in the midst of difficult situations. It is, in effect, the converse of self-efficacy and the same set of items can be used to measure both, using different response formats. The Situational Self-efficacy Measure reflects the confidence of the individual not to engage in a specific behavior across a series of difficult situations.

Both the Self-efficacy and Temptation measures have the same structure (Velicer et al., 1990). Typically, there are three factors reflecting the most common types of tempting situations: negative affect or emotional distress, positive social situations, and craving. The Temptation/Self-efficacy measures are particularly sensitive to the changes that are involved in progress in the later stages and are good predictors of relapse. Self-efficacy can be represented by a monotonically increasing function across the five stages. Temptation is represented by a monotonically decreasing function across the five stages. Figure 4 illustrates the relation between stage and these two constructs.

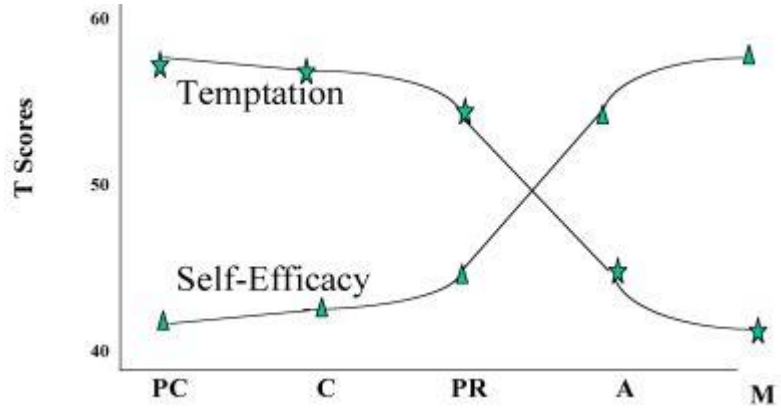

Figure 4. The Relationship between Stage and both Self-efficacy and Temptation

C-Dependent Measures :(How Change Occurs)

Processes of Change are the covert and overt activities that people use to progress through the stages. Processes of change provide important guides for intervention programs, since the processes are the independent variables that people need to apply, or be engaged in, to move from stage to stage. Ten

processes have received the most empirical support in our research to date. The first five are classified as Experiential Processes and are used primarily for the early stage transitions. The last five are labeled Behavioral Processes and are used primarily for later stage transitions. Table 1 provides a list of the processes with a sample item for each process from smoking cessation as well as alternative labels.(Prochaska & DiClemente, 1983; Prochaska, et al,1988)

I. Experiential Processes of Change: (1-5)

1-Consciousness Raising [Increasing awareness] involves increased awareness about the causes, consequences and cures for a particular problem behavior. Interventions that can increase awareness include feedback, education, confrontation, interpretation, bibliotherapy and media campaigns.

2-Dramatic Relief [Emotional arousal] initially produces increased emotional experiences followed by reduced affect if appropriate action can be taken. Psychodrama, role playing, grieving, personal testimonies and media campaigns are examples of techniques that can move people emotionally.

3-Environmental Reevaluation [Social reappraisal] combines both affective and cognitive assessments of how the presence or absence of a personal habit affects one's social environment such as the effect of smoking on others. It can also include the awareness that one can serve as a positive or negative role model for others. Empathy training, documentaries, and family interventions can lead to such re-assessments

4-Social Liberation [Environmental opportunities] requires an increase in social opportunities or alternatives especially for people who are relatively deprived or oppressed. Advocacy, empowerment procedures, and appropriate policies can produce increased opportunities for minority health promotion, gay health promotion, and health promotion for impoverished people. These same procedures can also be used to help all people change such as smoke-free zones.

5-Self Reevaluation [Self-reappraisal] combines both cognitive and affective assessments of one's self-image with and without a particular unhealthy habit, such as one's image as a couch potato or an active person. Value clarification, healthy role models, and imagery are techniques that can move people evaluative.

II. Behavioral Processes of Change: (6-10)

6-Stimulus Control [Re-engineering] removes cues for unhealthy habits and ads prompts for healthier alternatives. Avoidance, environmental re-engineering, and self-help groups can provide stimuli that support change and reduce risks for relapse. Planning parking lots with a two-minute walk to the

office and putting art displays in stairwells are examples of reengineering that can encourage more exercise.

7-Helping Relationship [Supporting] combine caring, trust, openness and acceptance as well as support for the healthy behavior change. Rapport building, a therapeutic alliance, counselor calls and buddy systems can be sources of social support. I have someone who listens when I need to talk about my smoking

8-Counter Conditioning [Substituting] requires the learning of healthier behaviors that can substitute for problem behaviors. Relaxation can counter stress; assertion can counter peer pressure; nicotine replacement can substitute for cigarettes, and fat free foods can be safer substitutes.

9-Reinforcement Management [Rewarding] provides consequences for taking steps in a particular direction. While reinforcement management can include the use of punishments, we found that self-changers rely on rewards much more than punishments. So reinforcements are emphasized, since a philosophy of the stage model is to work in harmony with how people change naturally. Contingency contracts, overt and covert reinforcements, positive self-statements and group recognition are procedures for increasing reinforcement and the probability that healthier responses will be repeated.

10-Self Liberation [Committing] is both the belief that one can change and the commitment and recommitment to act on that belief. New Year's resolutions, public testimonies, and multiple rather than single choices can enhance self-liberation or what the public calls willpower. Motivation research indicates that people with two choices have greater commitment than people with one choice; those with three choices have even greater commitment; four choices do not further enhance will power. So with smokers, for example, three excellent action choices they can be given are cold turkey, nicotine fading and nicotine replacement.

Advantages of TTM

The Transtheoretical Model has general implications for all aspects of intervention development and implementation.

1- The Transtheoretical Model is an appropriate model for the recruitment of an entire population. In contrast to traditional interventions, the Transtheoretical Model makes no assumption about how ready individuals are to change. It recognizes that different individuals will be in different stages

and that appropriate interventions must be developed for everyone. As a result, very high participation rates have been achieved.

2-The Transtheoretical Model can result in high retention rates. In contrast to Traditional interventions, the Transtheoretical Model is designed to develop interventions that are matched to the specific needs of the individual. Since the interventions are individualized to their needs, people much less frequently drop out because of inappropriate demand characteristics.

3-The Transtheoretical Model can provide sensitive measures of progress. In contrast to action-oriented programs, the Transtheoretical Model includes a set of outcome measures that are sensitive to a full range of cognitive, emotional, and behavioral changes, recognize, and reinforce smaller steps than traditional action-oriented approaches.

4-The Transtheoretical Model can facilitate an analysis of the mediation mechanisms. Interventions are likely to be differentially effective. Given the multiple constructs and clearly defined relationships, the model can facilitate a process analysis and guide the modification and improvement of the intervention. For example, an analysis of the patterns of transition from one stage to another can determine if the intervention was more successful with individuals in one stage and not with individuals in another stage. Likewise, an analysis of process use can determine if the interventions were more successful in activating the use of some processes.

The Transtheoretical Model can support a more appropriate assessment of outcome. Interventions should be evaluated in terms of their impact, i.e., the recruitment rate times the efficacy. For example, a smoking cessation intervention could have a very high efficacy rate but a very low recruitment rate. This otherwise effective intervention would have very little impact on smoking rates in the population. In contract, an intervention that is less effective but has a very high recruitment rate could have an important impact on smoking rates in the population. Interventions based on the Transtheoretical Model have the potential to have both a high efficacy and a high recruitment rate, thus dramatically increasing our potential impact on entire populations of individuals with behavioral health risks

Subjects and Methods

Study design :

The current study is a cross sectional study to detect the prevalence of health risk behaviors among scientific professionals to assess its relation to their health status.

Study Population:

Scientific professionals working at National Research Centre (NRC), which is the main research centre in Egypt related to scintiefic research academi. According to its central statistic admistration data about the staff numbers and careers in March 2004, there were 2546 scientific researchers (males to females ratio was 1:1.2) with different degrees including 382professors, 433assistant professors, 837researchers, 516assistant researchers and 387researchers assistant working in 13 Research Divisions which are arranged according to staff number:

1-Agriculture(451) 2-Medicine (348) 3-Pharmacology(297)

4-Genetic engenering and biotecnology(286) 5-Nutrition (224)

6-Chemistry(193) 7-Non-organic chemistry (179)

8- Engenering(128) 9-Veteriniary(96) 10-cloth industries (92)

11-Physics (85) 12-Human genetic (84) 13- Environment (83).

in addition to other practical untis for public and community services such as medical services unit and its outpatients , food industries unit and bussiness men services unit.

Study duration :

The data collection and clinical work were carried out within 4 month (from the begening of March 2003 to the end of June of the same year)

Study group:

First,the target group was the professors and assistant professors as being older, they spent longer period in the scientific field and they are also suggested to have more valuable medical history.

Then , another careers were included in the study because:

1- Not all the total number of professors and assistant professors were available during the study period and some of them refuse to participate .

2-The researchers and specialists contribute a large population(33%of all staff members) which could not be ignored, especially most of them were ≥ 40 years old.

3- Assistant researchers and researchers assistantces (who worked for at least 3 years in the scientific field) were interested to participate in the study and care to have more healthy life style (they represented only 8.4% of the study group).

Size of Study group : 800 subjects were sugessted (which were the round total number of professors and assistant professors recorded at the time of the study)

After exclusion of the questionnaires with incomplete data and those who spent less than 3 years in the scientific field, 664 subjects were participated and completed their questionnaires.

Method:

I-The study group received a **designed self administrated questionnaire** to collect data about:

1-Personal data (name, age, sex, marital status, children number and scientific degree)

2-Medical history: (past history and current heath problems, regular check up)

3-Different health risk behaviors such as:

a-Smoking behavior and attitude towards smoking cessation.

b-Dietary habits and intake of certain nutritional elements.

c-Alchol and drug intake.

d-Physical activity practices.

e-Injury exposure and care about safety rules.

f-Dealing with computer and TV.

A pilot sample included 35 questionnaires was collected and according to this sample some items were modified to get the final model of the questionnaire used in this study.

4-Exposure to work stress was measured using the job content questionnaire (JCQ) devolped by **Karasek and Theorell (1990)**. It included questions about job demand , job control and job social relationships with 3 questions per each item . Summation of 0 or 1 in each of these item is considered low score while summation of 2 or 3 is considered high score.

II- Clinical examination included:

1-Anthropometric measurments was done according to **Rose, et al (1982)**

a-Body weight : was measured once by a balance scale to the nearest 0.5 Kg. Individuals were bare footed and the balance was calibrated before use for each subject.

b- Height: standing height was measured once, to the nearest 0.5 cm, without shoes, the back square againest the wall, eye looking straight the wall and a mark on the wall was done. The distance between the mark on the wall and the floor was measured by a scaled tape.

Weight in kilograms was divided by height in meters square (weight [kg]/height squared [m^2]) to calculate body mass index.

The National Institute of Health **(NIH,1999)** defines overweight as a BMI of 25.0-29.9 kg/m^2 and obesity as a BMI greater than or equal to 30.0 kg/m^2

2-Blood pressure (BP) measurments: using an ordinary mercury sphygmomanometer , the subjects were always in the sitting position.

According to **WHO(1978)** criteria the manometer was placed on horizontal surface and the systolic blood pressure was defined as the first korotkoff sound while the diastolic was defined when the sound disappeared.

BP was measured twice at the same sitting and the mean of two reading was taking except for those who had systolic blood pressure $\geq$ 140 mmHg or diastolic blood pressure $\geq$ 90mmHg and not known to receive hypertensive drugs, another two measuring were done with about 2-3 days separation for confirmation.

This was done as measurement on separate occasions is necessary to avoid overestimation of prevalence **(Radi et al, 2004)**

Subjects were cosidered hypertensive if they had systolic blood pressure $\geq$ 140 mmHg or diastolic blood pressure $\geq$ 90mmHg all through the 3 separated measurments **(NIH,1997)**,or if they are known to be hypertensive and recieving antihypertensive medication.

Data analysis:

Results were analysed on personal computer using SPSS program version 10 and suitable statistical data were applied.

Section I: Demographic, health risk behaviors and health characteristics of the studied group

Table (3): Characteristics of the studied sample: (Total No = 664)

Characteristics	Males No. % 302 45.48	Females No. % 362 54.52
Age (in years)		
<30	12	22
30-	3.9	6
40-	62	105
50-	20.5	29
>60	106	134
	35.1	37
	69	76
	22.9	21
	53	25
	17.6	7
Marital status		
single	32	50
married	10.6	13.8
widowed	267	295
divorced	88.4	81.5
	2	12
	0.7	3.3
	1	5
	0.3	1.4
Scientific degree		
- Professors	111	76
-Assistant Professors	36.7	21.0
-Researchers	62	84
- Assistant	20.5	23.2
Researchers	79	121
-Researchers	26.2	33.4
assistances	28	47
-Specialists	9.3	13.0
	12	27
	4.0	7.5
	10	7
	3.3	1.9

As shown in table (3): One third of the scientific professionals in the studied sample were in the age group (40-50) years, the majority were married and the (female: male) ratio was (1.2:1). Professors represented the highest percentage among males while ost of the females were researchers.

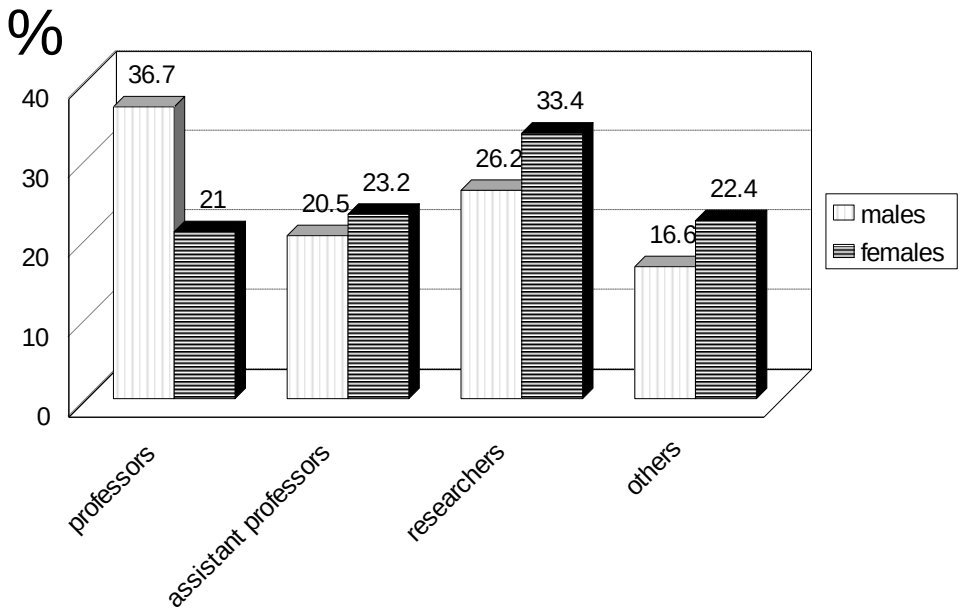

Fig 5: Scientific degree of the studied group

Table4: Prevalence of cigarette smoking among the studied group:

CHARACTERISTIC	Male No.	%	Females No.	%
	302	45.48	362	54.52
Smoking status				
Current smokers	66	21.9	1	0.3
Ex-smokers	46	15.2	5	1.4
Non smokers	190	62.9	356	98.3

Table (4) shows that the prevalence of cigarette smoking was not so high among the studied group.

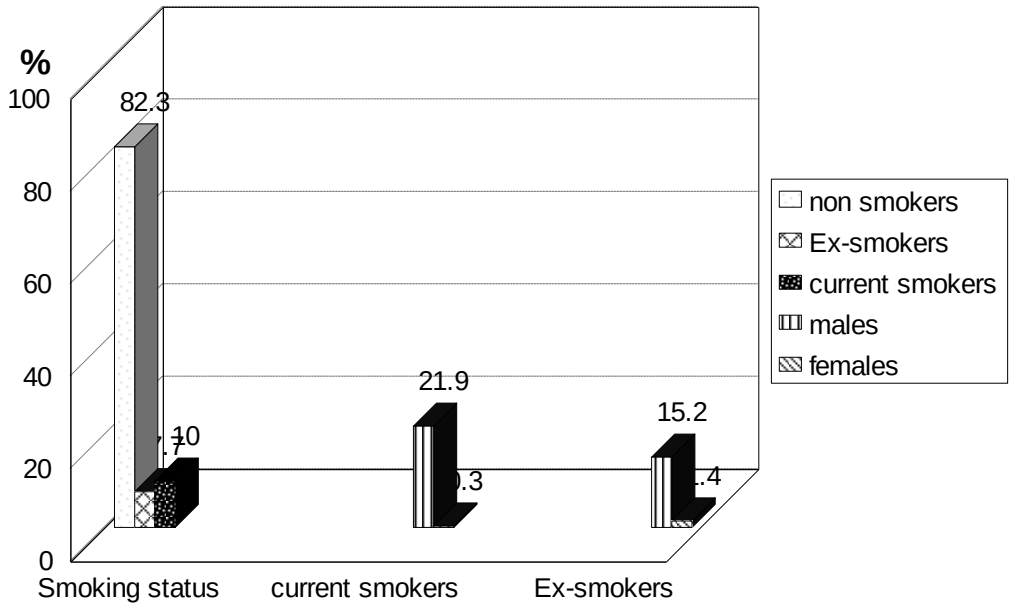

Fig 6: Smoking behavior of the studied group

Table5: Attitude towards smoking cessation among current and ex-smokers (Total No. =118)

CHARACTERISTIC	No.	%
Thinking about smoking cessation:		
Ex-smokers(all)	51	43.3
Current smokers:		
yes	52	44.0
no	15	12.7
Motivation for smoking cessation:		
Fear of health	95	80.2
hazards	5	4.5
Chronic illness	18	15.3
Others*		
Previous method used for smoking cessation:	96	81.4
No specific method	2	1.9

Medical counseling	4	3.8
Gum, water ,mint--	4	3.8
---	12	10.2
Gradual decrease		
Sudden stop		
History of smoking cessation:		
Ex- smokers(all)	51	43.2
Current smokers:		
Return	53	44.9
no	14	11.9
Believe that smoking is harmful:	3	2.6
do not think so	13	11.0
Possibly	102	86.4
Of course		

Table (5) shows that most of the current smokers have intended to stop smoking and most of them stopped actually but returned. Knowledge about health hazards of smoking was the strongest motivation for smoking cessation among both current and ex-smokers, most of them did not use specific method for cessation and believed in harmful effects of smoking.

*Other factors motivate smoking cessation among these group were family or friends advises, mass media massages, religious causes, financial causes, strong desire to stop smoking and Fear of passive smoking health hazards on their children.

Table6: Cigarette smoking behavior of current smokers (Total No. =67)

CHARACTERISTIC	No.	%
Cigarette no (per day)		
<10	20	29.8
10-19	32	47.7
20-29	13	19.5
≥30	2	3.0
Period(in years)		
<5	1	1.5
5-9	12	18.0
≥10	54	81.5
Common smoking place		
Home	10	15.0
Work place	10	15.0
Outdoors	15	22.5
All above	32	47.5

Table (6) shows that most of the current smokers started smoking from more than 10 years and used to smoke about (10-20) cigarette per day and they did not have specific place for smoking.

Table7: Prevalence of intake of tea, coffee, alcohols and drugs

CHARACTERISTIC	Males No. % 302 45.48	Females No. % 362 54.52
Tea or coffee intake		
Never	27	24
Rare	9.0	6.6
Once per day	8	24
2-3 times per day	2.7	6.6
>3 times per day	50	76
	16.4	21.3
	160	189
	53.2	51.9
	57	49
	18.7	13.6
Alcohol intake		
Never	274	348
Rare	90.8	96.2
Past history of intake	25	14
then stop	8.2	3.8
	3	
	1.0	
drugs intake		
Never	288	344
For medical purpose	95.2	95.0
Sometimes	10	17
	3.3	4.7
	4	1
	1.5	0.3

Table (7) shows that tea, coffee intake was within the moderate range (2-3 times daily) among the majority of each group, Alcohol, and drugs intake is extremely very rare

Table 8:- Dietary habits among the studied group

CHARACTERISTIC	Males No. % 302 45.48	Females No. % 362 54.52
Self image of weight :	14	2
Under weight	4.7	0.6
Normal	165	139

Over weight	54.5	38.4
Obese	119	204
	39.5	56.3
	4	17
	1.3	4.8
Trials for weight reduction :	16	25
Succeed	5.3	6.8
Regain weight	28	114
Failed	9.3	31.5
Planned	18	22
Not planned	6.0	6.2
	50	69
	16.5	19.1
	190	132
	62.9	36.5
Regular meals intake (daily):	50	48
Always	16.5	13.3
Often	149	199
Sometimes	49.0	54.5
Rare	71	88
Never	23.5	24.3
	10	15
	3.3	4.3
	23	11
	7.7	3.2
Snacks		
Always	4	10
Often	1.3	2.8
Sometimes	20	40
Rare	6.7	11.1
Never	97	159
	32.1	44.0
	100	97
	33.1	26.7
	81	56
	26.8	15.3
Main meal		
Breakfast	21	29
Lunch	7.0	8.0
Dinner	230	297
	76.1	82.1
	51	36
	16.9	9.9
Rate of fast food consumption per month:	154	139
No	51.0	38.4
Rare	7	3
1-	2.3	0.8
5-	88	187
>8	29.2	51.7
	27	23
	8.9	6.4
	26	10
	8.6	3.6

As shown in table (8): the percentage of over weight and obesity is higher among female than males about half of the females considered themselves over weight while about half of the males considered themselves normal weight.

Females are more interest in weight reduction. Most of both groups receive daily regular meals and the lunch is the main one. Snacks and fast food is not so prevalent both groups.

Table 9:-**Prevalence of intake of certain nutritional elements:**

CHARACTERISTIC	Males No.	%	Females No.	%
	302	45.48	362	54.52
Fruits(weekly)				
Never	----		3	
1-3 times	----		0.8	
4-6 times	107		83	
Daily	35.5		22.9	
	95		82	
	31.6		22.7	
	99		194	
	32.9		53.5	
Vegetables (weekly)				
Never	7		7	
1-3 times	2.3		2.0	
4-6 times	121		148	
Daily	40.1		40.8	
	77		90	
	25.5		24.9	
	97		117	
	32.1		32.3	
Quantity of fat in the diet:	94		106	
Low	31.1		29.3	
Moderate	198		242	
High	65.6		66.9	
	10		14	
	3.3		3.8	
Type of fat in the diet:	146		152	
vegetable oils	48.2		41.9	
Butter	99		152	
Mixed (1+2)	32.9		41.9	
Margarine +others	31		40	
	10.3		11.2	
	26		18	
	8.6		5.0	
Salt intake				
Low salt diet	76		69	
Moderate	25.2		19.1	
High	197		261	
	65.2		72.1	
	29		32	

	9.6	8.8
Sugar amount/one drink		
	27	85
Less than one spoon	9.0	23.6
One spoon	64	123
2-3 spoons	21.1	33.9
>3 spoons	177	126
	58.5	34.8
	34	28
	11.4	7.7
Rice(weekly)		
No	8	17
1-2 times	2.7	4.7
3-5 times	101	136
daily	33.4	37.5
	128	119
	42.4	32.9
	65	90
	21.5	24.9
Bread/day		
<1	2	18
1-	0.7	5.0
3-	138	269
>4	45.7	74.3
	138	72
	45.7	19.9
	24	3
	7.9	0.8
Bread type(mainly)		
Brown bread	218	263
White bread	72.1	72.7
	84	99
	27.9	27.3

As shown in table (9): Apart from higher fruits consumption among females and higher sugar consumption among males, both groups have nearly similar food consumption habits, most of them have moderate fat diet (mainly vegetable oils and animal butter), moderate salt intake, variable rice intake and (1-3) loaves of bread per day (mainly brown bread).

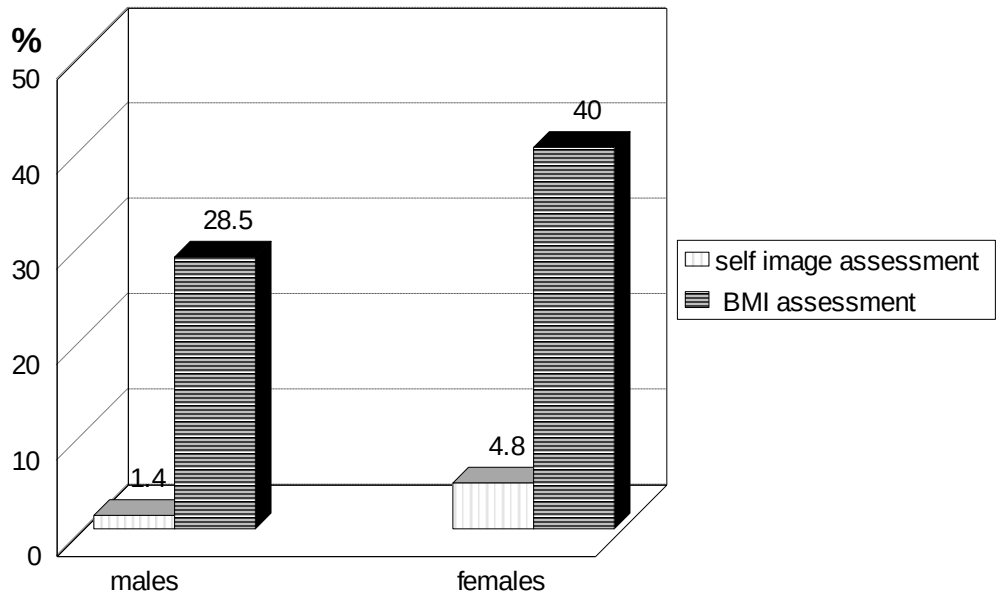

Fig.7: Assessment of obesity by BMI and self image of weight among males and females

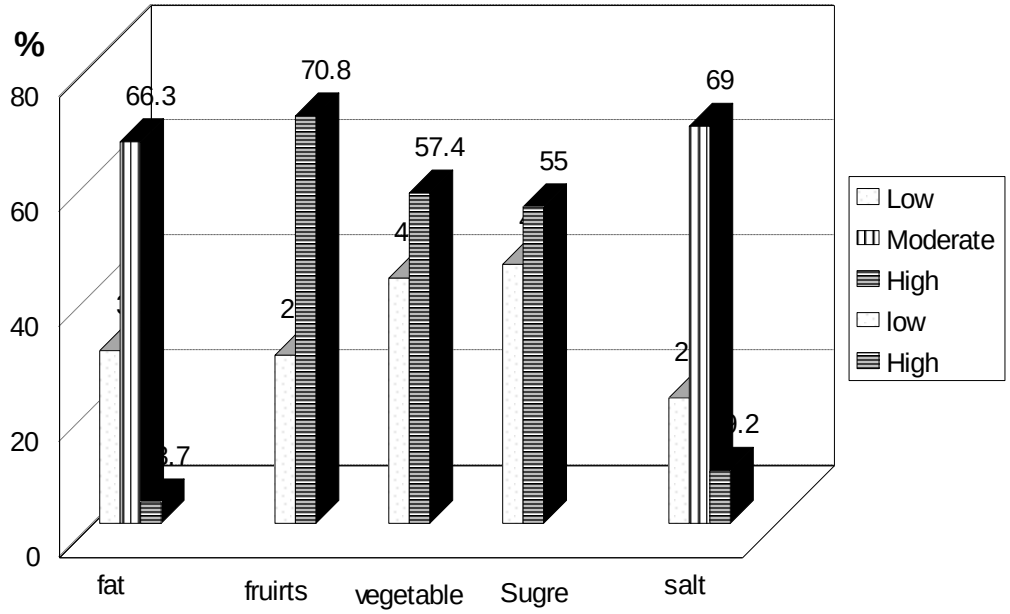

Fig 8: Nutritional intake among the studied group

Table10: Physical activities practice among the studied group

CHARACTERISTIC	Males No. %	Females No. %
	302 45.48	362 54.52

Physical activity:		
Recently started	11	46
Started from a	3.7	12.5
period	53	46
Stopped	17.5	12.5
Never	202	152
	67.0	42.0
	36	116
	11.8	32.0
Gem for20min. (weekly):	179	230
Never	59.4	63.6
1-2 times	87	87
3-4 times	28.7	23.9
5 times or more	17	36
	5.6	10.0
	19	9
	6.3	2.4
Regular daily walking:	90	193
Never	29.9	53.2
<half an hour	114	111
1-2 hours	37.8	30.6
>2 hours	88	54
	29.3	15.0
	9	4
	3.0	1.2
Motivation for physical activities practice	232	179
Health benefits	76.8	49.5
Weight reduction	43	125
Both	14.2	34.5
Others*	21	49
	7.0	13.4
	6	9
	2.0	2.6
Obstacles against physical activities practice	193	144
Work	63.9	39.8
responsibilities	50	189
Family	16.5	52.2
responsibilities	25	9
Age or health	8.3	2.5
status	34	20
Place or financial	11.3	5.5

Table (10) shows that the majority of the subjects stopped their previous physical activities and sports practice, they did not do regular daily walking or weekly gem practice in spite of their positive attitude towards the health benefits of physical activities. Work responsibilities were the most prevalent obstacle against physical activities among the majority of the studied group.

*Other motivations towards physical activities practice include pleasure and to kill the time

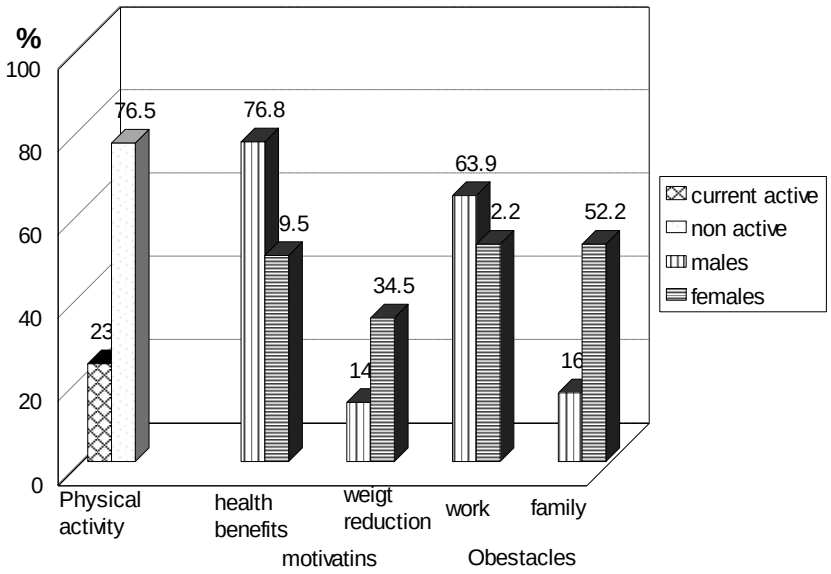

Fig 9: Physical activity practices, motivations and obestecles

Table 11: TV watching and computer use:

CHARACTERISTIC	Males No.	%	Females No.	%
	302	45.48	362	54.52
Computer use (per day)				
Never	21	7.0	20	5.5
1-3 hour	228	75.5	300	82.9
3-6 hours	44	14.5	40	11.0
>6 hours	9	3.0	2	0.6
TV watching (per day)				
Never	2	0.7	1	0.3
1-3 hour	267	88.4	315	87.1
3-6 hours	30	9.9	39	10.8
>6 hours	3	3.3	3	0.8

Table (11) shows that most of the studied group reported computer and TV use within 1-3 hours/day.

Table 12: Unsafe behaviors that increase the risk of injuries

CHARACTERISTIC	Males	Females
	No.	No.
	%	%
	302	362
	45.48	54.52
Driving a car		
Yes	200	129
No	66.2	35.6
Belt use among car	102	233
drivers:(no.=329)	33.8	64.4
Always		
Often	150	95
Sometimes	75.0	73.6
Never	33	24
Speed control among car	16.5	18.6
drivers: (no.=329)	15	7
Always	7.5	5.4
Often	2	3
Sometimes	1.0	2.4
Never		
	114	87
	57.0	67.4
	70	36
	35.0	28.0
	11	3
	5.5	2.3
	5	3
	2.5	2.3
Follow safe behaviors when		
using different instruments	195	220
at home:	64.5	60.7
Always	93	125
Often	30.8	34.4
Sometimes	12	15
Never	4.0	4.1
Follow safe behaviors when	2	2
using different instruments	0.7	0.6
at work:		
Always		
Often	236	280
Sometimes	78.1	77.3
	60	75
	19.9	20.7
	6	7
	2.0	2.0
History of previous injuries:		
Road Injuries	58	42
Lab. Injuries	19.2	11.6
Indoor Injuries	22	26
Multiple places	7.3	7.2

Never	18	78
	6.0	21.6
	6	24
	2.0	6.6
	198	192
	65.5	53.0

Table (12) shows: About two thirds of males and one third of females derived their private cars by themselves. Most of them always use the safety belt and females were more careful as regard speed control. The majority of the studied sample was careful about safe behaviors inside home and at work when using different instruments. The history of road injuries was higher among males while the history of indoor injuries was higher among females.

Table 13: Job stress exposure, stress reaction and sleeping hours (per day)

		Males		**Females**
CHARACTERISTIC	**No**	**%**	**No**	**%**
		302		**362**
		45.48		**54.52**
Job demand				
Low		60		78
High		19.6		21.5
		242		284
		80.4		78.5
Job control				
Low		40		59
High		13.2		16.3
		262		303
		86.8		83.7
Job social relationship				
Low		54		60
High		17.9		16.5
		248		302
		82.1		83.5
Stress reaction				
Fast reaction-slow calm		53		50
Fast reaction-fast calm		17.5		13.8
Slow reaction- slow calm		93		119
Slow reaction-fast calm		30.8		32.9
		127		167
		42.0		46.1
		29		26
		9.6		7.2
Sleeping hours(per day)				
<6		70		105
6-8		23.2		29
>8		222		252
		73.5		69.6

10	5
3.3	1 .4

Table (13) showed that the majority of the studied group reported positive answer to all items of the job content questionnaire and according to JCQ scoring; they had a type of job of high demand high control and high social relationship. Reaction towards stress among the both study group was mainly (slow reaction- slow calm) and most of them had 6-8 sleeping hours (per day).

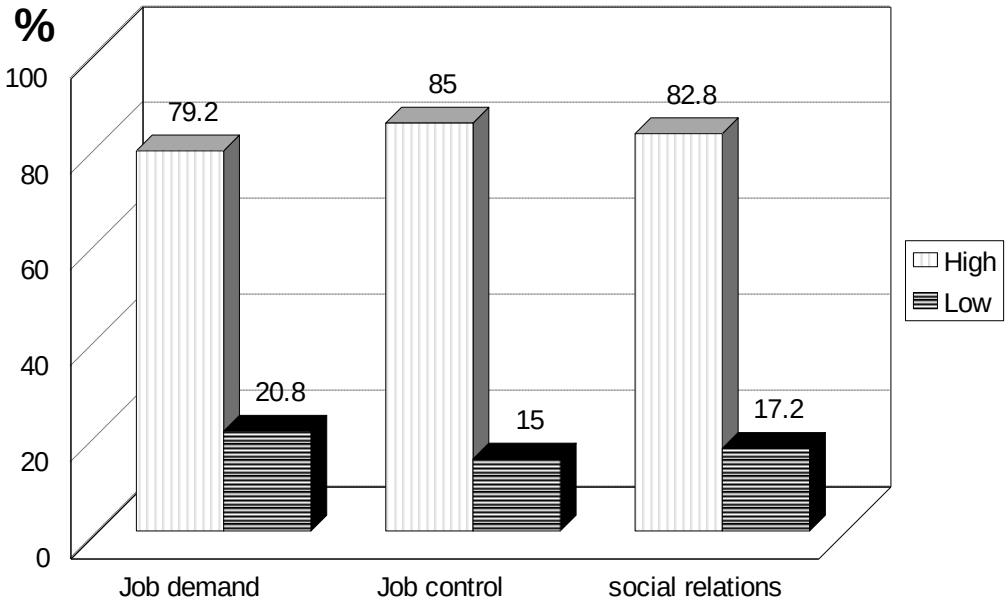

Fig 10 : Job stress scoring among the studied group

Table14: Health status of the study group

CHARACTERISTIC	Males No	Males %	Females No	Females %
	302	45.48	362	54.52
Health status:				
Poor	4		8	
Fair	1.4		2.2	
Good	89		160	
Excellent	29.3		44.2	
	187		181	
	62.1		50.0	
	22		13	
	7.2		3.6	
History of chronic illness				
	102		110	30.5
Yes	33.8		252	69.5
No	200			
	66.2			
History of chronic illness and obesity				25
DM				6.9
Hypertension	23			47
Both	7.6			13.0
Others*	44			9
Obesity	14.6			2.5
	6			29
	2.0			8.1

	29 9.6 86 28.5	145 40.0
Medical chick up:		
Yes	127	114
No	42.1	31.5
Sometimes	170	245
	56.1	67.6
	5	3
	1.8	0.9

As shown in table (14): About 1/3 of the studied group suffered from one or more chronic disease mostly, DM and Hypertension with nearly similar percentage among males and females.

*Other chronic diseases recorded by the studied group include other cardiovascular diseases, elevated cholesterol, cancer, bronchial asthma, liver dysfunction, chronic cholecystitis, heart burn, hiatus hernia, irritable colon, hyperthyroidism, rheumatic diseases, gout, disk prolepse, backache, neuritis, migraine headache, varicose veins, glaucoma, cataract and sinusitis.

The percentage of obesity was higher among females than males

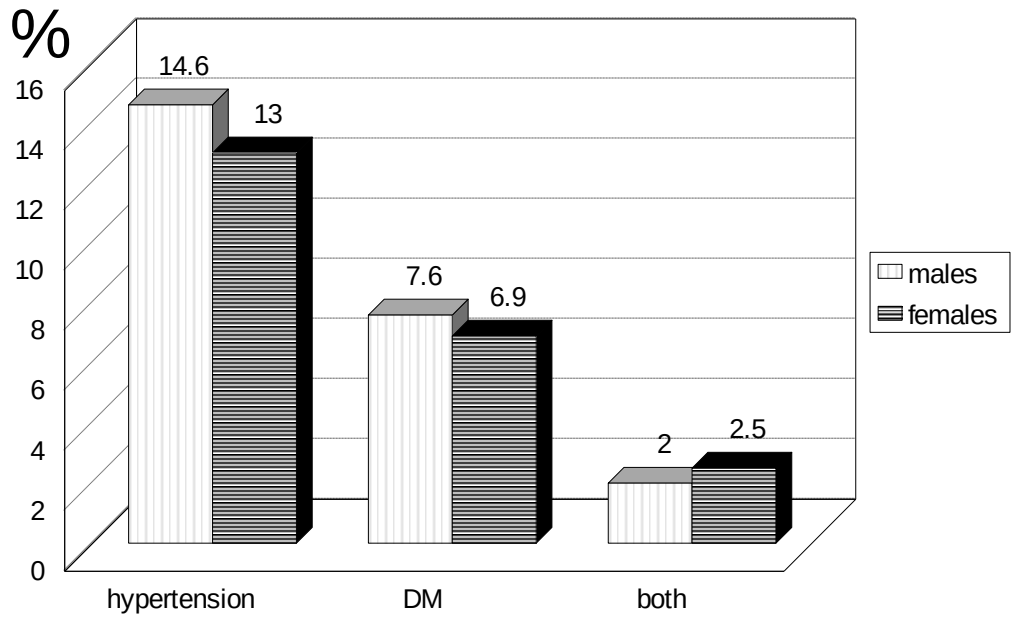

Fig 11: The percentage of hypertension and DM among males and females

Section II: Health risk behaviors in relation to history of chronic illness

Table 15: Cigarette smoking in relation to DM among males

Smoking status	Non-Diabetics No. %	Diabetics No. %	X^2	P value
	273 100	29 100		
Current smokers	60 22.2	6 20.7	6.185	0.045*
Ex-smokers	37 13.7	9 31.0		
Non smokers	176 64.1	14 48.3		

Table (15) shows that the percentage of males with history of smoking (ex-smokers) was significantly higher among diabetics than non-diabetics.

Table16: Cigarette smoking in relation to DM among females

Smoking status	Non diabetics No. %	Diabetics No. %	X^2	P value
	328 100	34 100		
Current smokers	1 0.3	2 5.9	5.494	0.064
Ex-smokers	3 0.9	32 94.1		
Non smokers	324 98.8			

Table (16) shows that there was no significant relation between cigarette smoking and DM among female's group

Table17: Cigarette smoking in relation to hypertension among males

Smoking status	Non hypertensive No. %	Hypertensive No. %	X^2	P value
	252 100	50 100		
Current smokers	59 23.3	8 16	10.040	0.007*
Ex-smokers	31 12.4	15 30		
Non smokers	162 64.3	27 54		

Table (17) shows that the percentage of males with history of smoking (ex-smokers) was significantly higher among hypertensive than non-hypertensive.

Table 18: Cigarette smoking in relation to hypertension among females

Smoking status	Non hypertensive No. %	Hypertensive No. %	X^2	P value
	306 100	56 100		
Current smokers	4 1.3	1 1.8	7.60	0.022 *
Ex-smokers	302 98.7	2 3.6	8	
Non smokers		53 94.6		

Table (18) shows that the percentage of females with history of smoking (ex-smokers) was significantly higher among hypertensive than non-hypertensive.

Table 19: Cigarette smoking in relation to obesity among males

Smoking status	Non Obese No. %	Obese No. %	X^2	P value
	216 100	86 100		
Current smokers	52 24.2	14 16.7	1.990	0.370
Ex-smokers	32 14.9	14 16.7		
Non smokers	132 60.9	58 66.6		

Table (19) shows that there was no significant relation between cigarette smoking and obesity among males.

Table 20: Cigarette smoking in relation to obesity among females

	Non	Obese

Smoking status	Obese No. % 217 100	No. % 145 100	X^2	P value
Current smokers	1 0.5	---- ----	1.535	0.464
Ex-smokers	2	3		
Non smokers	1.0	2.0		
	214	142		
	98.5	98.0		

Table (20) shows that there were no significant relation between cigarette smoking and obesity among females.

Table 21: Dietary habits and intake of certain nutritional elements in relation to DM among males

Characteristic	Non-Diabetics No. % 273 100	Diabetics No. % 29 100	X^2	P value
Self image of weight :	13	1		
Under weight	4.8	3.4	0.557	
Normal	149	16	0.906	
Over weight	54.4	55.2		
Obese	107	12		
	39.3	41.4		
	4			
	1.5			
Regular meals intake (daily):	179	20	1.782	
Always	65.3	69.0	0.776	
Sometimes	64	6		
never	23.6	20.7		
	30	3		
	11.1	10.3		

Snacks				
Always		23	1	
Sometimes		8.5	3.4	4.263
Never		88	9	0.372
		32.2	31.0	
		162	19	
		59.3	65.5	
Main meal				
Breakfast		13	6	
Lunch		6.0	7.1	1.966
Dinner		166	63	0.932
		76.9	72.9	
		36	17	
		17.1	20.0	
Fruits(weekly)				
Never				
1-3 times		96	12	
4-6 times		35.2	39.3	0.615
Daily		88	7	0.735
		32.2	25	
		89	10	
		32.6	35.7	
Vegetables (weekly)				
Never		6	1	
1-3 times		2.2	3.4	1.566
4-6 times	112	40.7	10	0.667
Daily		70	34.5	
		25.9	6	
		85	20.7	
		31.1	12	
			41.4	
Quantity of fat in the diet:		78	17	
Low		28.5	57.1	9.894
Moderate	186	68.1	11	0.007*
High		9	39.3	
		3.3	1	
			3.6	
Type of fat in the diet:	130	47.4	16	
Vegetable oils		89	55.2	2.712
Butter		32.7	10	0.744
Mixed (1+2)	30	11	34.5	
Margarine $\pm$ others		24	1	
		8.9	3.2	
			2	
			6.9	
Salt intake				
Low salt diet		62	14	
Moderate		23.0	48.3	9.289
High		183	14	0.026*
		66.7	48.3	

		28	1	
		10.3	3.4	
Sugar amount per drink		18	9	
Less than one spoon		6.6	31.0	61.119
One spoon		45	18	0.00*
2-3 spoons		16.7	62.1	
>3 spoons		176	2	
		64.1	6.9	
		34		
		12.6		
Rice(weekly)				
No		7	1	
1-2 times		2.6	3.5	5.014
3-5 times		86	15	0.166
Daily		31.6	51.7	
	119	43.5	9	
		61	31.0	
		23.3	4	
			13.8	
Bread intake (daily)		29	7	
≤1 loaf		10.7	25	11.681 (
1.5-3		172	18	.55
>3		62.1	62.5	4
Bread type (mainly)		72	4	
Brown bread		26.4	12.5	
White bread				3.044
		194	24	0.385
		72.1	82.8	
		79	5	
		27.9	17.2	
Drinking tea and coffee:		29	6	
Rare		10.7	20.7	3.576
Once daily		45	4	0.311
2-3 times daily		16.7	13.8	
>3 times daily		146	16	
		53.0	55.2	
		53	3	
		19.6	10.3	

Table (21) shows that the percentage of males consumed low fat, low salt diet and <one spoon of sugar per drink were significantly higher among diabetics than non-diabetics.

Table 22: Dietary habits and intake of certain nutritional elements in relation to DM among females

Characteristic	Non Diabetics No.	%	Diabetics No.	%	X^2	*P value*
	328	100	34	100		
Self image of weight :						
Under weight	2	0.6	9	27.3	5.627	0.131
Normal	129	39.5	21	60.6		
Over weight	183	55.9	4	12.1		
Obese	13	4.0				
Regular meals intake (daily):						
Always	210	67.3	27	77.3	5.064	0.281
Sometimes	85	25.7	3	9.7		
never	22	7.0	4	13		
Snacks						
Always	45	13.7	5	16.1	1.717	0.788
Sometimes	146	44.5	13	38.7		
Never	137	41.7	16	45.2		
Main meal						
Breakfast	27	8.2	2	6.3	1.454	0.835
Lunch	270	82.3	28	79		
Dinner	31	9.5	5	14.7		
Fruits(weekly)						
Never	3	0.9	6	18.2	8.453	0.038*
1-3 times	77	23.4	2	6.1		
4-6 times	80	24.4	26	75.8		
Daily	168	51.3				

Vegetables (weekly)				
Never		6	1	
1-3 times		1.9	3	1.272
4-6 times		136	11	0.736
Daily		41.5	33.3	
		82	8	
		25.1	24.3	
		104	14	
		31.5	39.4	
Quantity of fat in the diet:		96	10	
Low		29.3	30.3	0.636
Moderate	221	67.3	22	0.728
High		11	63.6	
		3.4	2	
			6.1	
Type of fat in the diet:		138	15	
Vegetable oils		41.9	44.4	5.586
Butter		140	12	0.471
Mixed (1+2)		42.5	35.3	
Margarine + others		36	3	
		11.3	9.1	
		14	4	
		4.3	12.2	
Salt intake				
Low salt diet		61	8	
Moderate		18.7	24.2	.833
High		237	24	0.659
		72.1	69.7	
		30	2	
		9.2	6.1	
Sugar amount per drink		68	16	
Less than one spoon		20.9	47.2	16.94
One spoon		111	13	0.002*
2-3 spoons		33.8	37.7	
>3 spoons		122	4	
		37.0	12.1	
		27	1	
		8.3	3.0	
Rice(weekly)				
No		15	2	
1-2 times		4.6	6.5	0.364
3-5 times		124	12	0.948
Daily		37.7	35.5	
		107	12	
		32.7	35.5	
		82	8	
		25.0	22.5	

Bread intake (daily)	106	13	
≤1 loaf	32.8	39.1	9.155
1.5-3	202	19	0.517
>3	61.7	56.5	
Bread type (mainly)	20	2	
Brown bread	5.5	4.4	4.644
White bread			0.326
	228	27	
	69.5	80.0	
	100	7	
	30.5	20.0	
Drinking tea and coffee:	40	6	
Rare	12.7	19.3	3.463
Once daily	65	10	0.326
2-3 times daily	20.6	29.0	
>3 times daily	166	16	
	52.5	45.2	
	45	2	
	14.2	6.5	

Table (22) shows that the percentage of females consumed fruits daily and <one spoon of sugar per drink as significantly higher among diabetics than non-diabetics.

Table 23: Dietary habits and intake of certain nutritional elements in relation to hypertension among males

Characteristic	**Non hypertensive No. %**	**Hypertensive No. %**	***X²***	***P value***
	252 100	**50 100**		
Self image of weight :	14	--- -		
Under weight	5.5	--		13.157
Normal	140	25		0.004*
Over weight	55.5	50		
Obese	97	22		
	38.6	44		
	1	3		
	0.4	6		
Regular meals intake (daily):	159	40		
Always	62.9	79.6		14.088
Sometimes	64	6		0.007*
never	25.5	12.2		
	29	4		

		11.6	8.2	
Snacks				
Always		19	5	
Sometimes		7.6	10.2	2.035
Never		85	13	0.729
		33.6	24.5	
		148	32	
		58.8	65.3	
Main meal				
Breakfast		17	7	
Lunch		6.7	14	9.225
Dinner		186	38	0.161
		73.9	76	
		49	5	
		19.4	10	
Fruits(weekly)				
Never	---	-	---	
1-3 times		--	---	
4-6 times		89	18	2.252
Daily		35.3	36.7	0.324
		76	20	
		30.1	38.8	
		87	12	
		34.5	24.5	
Vegetables (weekly)				
Never		5	2	
1-3 times		2	4	9.215
4-6 times		98	24	0.027*
Daily		38.8	48	
		59	17	
		23.6	34	
		90	7	
		35.6	14	
Quantity of fat in the diet:		77	17	
Low		30.8	33.4	4.748
Moderate		169	29	0.093
High		66.8	58.3	
		6	4	
		2.4	8.3	
Type of fat in the diet:	122	48.2	24	
Vegetable oils		81	48	
Butter		32.3	18	0.711
Mixed (1+2)		27	36	0.982
Margarine + others		10.8	4	
		22	8	
		8.8	4	
			8	

Salt intake				
Low salt diet		58	20	
Moderate		23.3	40	.7.536
High		172	25	0.05*
		67.9	50	
		22	5	
		8.8	10	
Sugar amount per drink		19	8	
Less than one spoon		7.6	16	19.281
One spoon		43	20	0.001*
2-3 spoons		17.3	40	
>3 spoons		160	18	
		63.1	36	
	30	12	4	
			8	
Rice(weekly)				
No		6	2	
1-2 times		2.4	4	1.153
3-5 times		82	19	0.764
Daily		32.7	38	
		108	20	
		42.7	40	
		56	9	
		22.2	18	
Bread intake (daily)		24	8	
≤1 loaf		9.5	16	1.864
1.5-3		106	20	0.394
>3		42.0	40	
Bread type (mainly)		122	22	
Brown bread		48.5	44	
White bread				10.026
		182	35	0.018*
		72.2	70	
		70	15	
		27.8	30	
Drinking tea and coffee:		33	2	
Rare		13.5	4	10.131
Once daily		44	5	0.017*
2-3 times daily		17.6	10	
>3 times daily		125	37	
		49.2	74	
		50	6	
		20.0	12	

Table(23) shows that the percentage of males who were considered themselves obese, consumed 2-3 cups of tea daily, low salt diet and ≤ 1 spoon of sugar per drink was significantly higher among hypertensive than non hypertensive, while percentage of males consumed daily vegetables was significantly lower among hypertensive than non hypertensive.

Percentage of hypertensive males consumed brown bread and regular meals were significantly higher than percentage of hypertensive males consumed white bread and rarely regular meals.

Table 24: Dietary habits and intake of certain nutritional elements in relation to hypertension among females

Characteristic	Non hypertensive No. % 306 100	Hypertensive No. % 56 100	X^2	*P value*
Self image of weight :				
Under weight	2			
Normal	0.7	12		9.864
Over weight	127	21.5		0.020*
Obese	41.5	39		
	165	69.7		
	53.8	5		
	12	8.9		
	4.0			
Regular meals intake (daily):				
Always	200	46		
Sometimes	66.0	80.8		8.247
never	82	6		0.083
	26.5	11.5		
	24	4		
	7.5	7.7		
Snacks				
Always	43	14	7	
Sometimes	139	45.5	13	4.114
Never	124	40.5	21	0.391
			37	
			28	
			50	
Main meal				
Breakfast	25	4		
Lunch	8.2	7.1		2.034
Dinner	252	45		0.730
	82.4	80.4		
	29	7		
	9.4	12.5		
Fruits(weekly)				
Never	3			
1-3 times	1	13		
4-6 times	69	23.6		0.868
Daily	22.8	11		0.833
	70	20		
	23.2	32		
	160	56.4		
	53			

Vegetables (weekly)				
Never		6	1	
1-3 times		2	1.8	4.984
4-6 times		131	7	0.173
Daily		42.7	30.4	
		77	13	
		25.3	23.2	
	92	30	25	
			44.6	
Quantity of fat in the diet:		94	12	
Low		30.8	21.8	3.718
Moderate		202	40	0.156
High		66.2	70.9	
		10	4	
		3	7.3	
Type of fat in the diet:		128	23	
Vegetable oils		42.3	40.9	
Butter		128	22	8.340
Mixed (1+2)		42.3	39.0	0.214
Margarine + others		34	5	
		11.4	9.1	
		12	6	
		4.0	11.0	
Salt intake				
Low salt diet		52	18	
Moderate		16.8	32.1	7.147
High		226	34	0.028*
		73.9	60.7	
		28	4	
		9.2	7.1	
Sugar amount per drink		66	19	
Less than one spoon		21.6	33.4	7.869
One spoon	102	33.2	21	0.083
2-3 spoons	112	36.5	37.5	
>3 spoons		26	14	
		8.6	25.0	
			2	
			3.6	
Rice(weekly)				
No		13	4	
1-2 times		4.3	7.4	
3-5 times		112	24	2.411
Daily		36.5	42.6	0.492
		102	18	
		33.2	31.5	
		79	10	
		25.9	18.5	

Bread intake (daily)	99	21	
≤1 loaf	32.4	38.3	9.888
1.5-3	188	35	0.450
>3	61.3	61.7	
Bread type (mainly)	19		
Brown bread	6.3		1.293
White bread		39	0.863
	226	69.1	
	73.9	17	
	80	30.9	
	26.1		
Drinking tea and coffee:	41	7	
Rare	13.5	13.0	4.307
Once daily	61	15	0.230
2-3 times daily	20.0	26.8	
>3 times daily	158	31	
	51.5	54.8	
	46	3	
	15.0	5.6	

Table (24) shows that the percentage of females who considered themselves over weight and obese or consumed low salt diet were significantly higher among hypertensive than non-hypertensive.

Table 25: Dietary habits and intakes of certain nutritional elements in relation to obesity among males

Characteristic	**Non obese No. % 216 100**	**Obese No. % 86 100**	***X²***	***P value***
Self image of weight :	14	----		
Under weight	6.5	----		118.697
Normal	155	9		0.000*
Over weight	71.8	10.6		
Obese	47	73		
	21.7	84.7		
	---	4		
	---	4.7		
Regular meals intake (daily):	136	63		

Always	63.0	74.1	3.368
Sometimes	56	14	0.186
Never	25.9	16.4	
	24	9	
	11.1	10.5	
Snacks			
Always	18	6	
Sometimes	7.8	9.0	8.653
Never	73	23	0.070
	31.4	34.3	
	143	39	
	60.8	56.7	
Main meal			
Breakfast	13	9	
Lunch	6	10.5	1.866
Dinner	166	62	0.932
	77	71.5	
	37	15	
	17	18.0	
Fruits(weekly)			
Never	----	----	
1-3 times	----	----	
4-6 times	77	30	0.252
Daily	35.6	34.9	0.818
	66	30	
	30.5	34.9	
	73	26	
	33.9	30.2	
Vegetables (weekly)			
Never	6	1	
1-3 times	2.8	1.2	4.165
4-6 times	82	41	0.244
Daily	37.5	47.1	
	60	16	
	28.0	18.8	
	68	29	
	31.7	32.9	
Quantity of fat in the diet:	82	12	
Low	38.0	14.3	26.063
Moderate	132	66	0.000*
High	61.1	76.7	
	2	8	
	0.9	9.0	
Type of fat in the diet:	102	45	
Vegetable oils	47.9	49.7	4.982
Butter	75	29	0.421
Mixed (1+2)	32.1	33.7	
Margarine + others	25	6	
	11.0	7.3	
	14	6	
	5.6	7.3	

Salt intake			
Low salt diet	60	18	
Moderate	26.9	22.4	2.030
High	135	60	0.566
	63.0	70.1	
	21	8	
	10.1	7.5	
Sugar amount per drink	19	8	
Less than one spoon	8.9	9.4	8.860
One spoon	36	27	0.034*
2-3 spoons	16.8	31.8	
>3 spoons	136	42	
	62.6	48.2	
	25	9	
	11.7	10.6	
Rice(weekly)			
No	6	2	
1-2 times	2.6	2.1	1.347
3-5 times	70	33	0.718
Daily	32.4	38.4	
	98	33	
	45.4	38.4	
	42	18	
	19.6	21.1	
Bread intake (daily)	21	11	
≤1 loaf	9.7	12.8	0.684
1.5-3	92	34	0.710
>3	42.6	39.5	
Bread type (mainly)	103	41	
Brown bread	47.7	47.7	1.238
White bread			0.744
	154	66	
	71.3	76.7	
	68	20	
	28.7	23.3	
Drinking tea and coffee:	30	5	
Rare	14.0	5.9	4.704
Once daily	33	16	0.195
2-3 times daily	15.4	18.8	
>3 times daily	116	46	
	53.3	52.9	
	37	19	
	17.3	22.4	

Table (25) shows that the percentage of males who considered themselves over weight and obese, consumed high fat diet and one spoon of sugar per drink were significantly higher among obese than non-obese. Most of obese male considered themselves over weight, a little percentage considered themselves of normal weight and very little percentage considered themselves obese.

Table 26: Dietary habits and intakes of certain nutritional elements in relation to obesity among females

Characteristic	Non-obese No. % 217 100	Obese No. % 145 100	X^2 P value
Self image of weight :	2	---	
Under weight	0.9	---	119.522
Normal	131	8	0.000*
Over weight	60.3	5.5	
Obese	83	121	
	38.3	83.5	
	1	16	
	0.5	11.0	
Regular meals intake (daily):	149	99	
Always	68.4	68.0	0.550
Sometimes	54	34	0.760
Never	24.9	23.2	
	14	12	
	6.7	8.8	
Snacks			
Always	26	24	
Sometimes	12.2	16.5	2.523
Never	93	67	0.283
	42.7	46.0	
	98	54	
	45.1	37.5	
Main meal			
Breakfast	17	11	
Lunch	8	7.9	4.192
Dinner	184	115	0.381
	84.5	78.6	
	16	19	
	7.5	13.5	
Fruits(weekly)			
Never	4	---	
1-3 times	1.6	----	
4-6 times	63	25	3.098
Daily	24.9	23.4	0.377
	63	22	
	24.9	20.5	
	122	63	
	48.6	56.1	
Vegetables (weekly)			
Never	4	3	
1-3 times	2.0	2.1	3.800
4-6 times	82	65	0.284
Daily	37.7	45.1	
	62	29	

	28.5	19.7	
	69	48	
	31.8	33.1	
Quantity of fat in the diet:	65	41	
Low	30	28.3	2.672
Moderate	147	96	0.263
High	67.7	66.0	
	5	8	
	2.3	5.7	
Type of fat in the diet:	88	64	
Vegetable oils	40.8	43.7	
Butter	96	56	1.474
Mixed (1+2)	44.1	38.7	0.688
Margarine + others	24	16	
	10.9	11.3	
	9	9	
	4.2	8.3	
Salt intake			
Low salt diet	39	30	
Moderate	18.1	21.0	0.506
High	158	103	0.777
	72.7	70.6	
	20	12	
	9.2	8.4	
Sugar amount per drink	46	39	
Less than one spoon	21.3	27.0	7.464
One spoon	67	56	0.058
2-3 spoons	31.0	38.3	
>3 spoons	88	38	
	40.3	26.2	
	16	12	
	7.4	8.5	
Rice(weekly)			
No	9	8	
1-2 times	4.2	5.5	0.614
3-5 times	84	53	0.893
Daily	38.3	36.5	
	70	50	
	32.2	34.5	
	54	34	
	25.2	23.5	

Bread intake (daily)	65	35		
≤1 loaf	30	24.1	2.288	
1.5-3	141	105	0.318	
>3	65	72.5		
Bread type (mainly)	11	5		
Brown bread	5	3.4		
White bread			4.554	
	163	102	0.336	
	75	70		
	54	43		
	25	30		
Drinking tea and coffee:	32	15		
Rare	14.8	10.9		
Once daily	52	26	5.418	
2-3 times daily	23.9	17.4	0.144	
>3 times daily	102	87		
	46.9	59.4		
	31	17		
	14.4	12.3		

Table (26) shows that the percentage of males who considered themselves over weight and obese, was significantly higher among obese than non-obese. Most of obese female considered themselves over weight; a little percentage considered themselves obese and very little percentage considered themselves normal weight.

Table27: Physical activity practices in relation to DM among males

Characteristic	**Non Diabetics**		**Diabetics**	***X²***	***P value***
	No.	**%**	**No.**	**%**	
		273		**29**	
		100		**100**	
Physical activity:		9		2	
Recently started		3.3	7.1		1.97
Start from a		50		3	0.579
period		18.2	10.7		
Stopped		182		20	
Never		66.9	67.9		
		32		4	
		11.5	14.3		
Gem for20min. (weekly):	161	59.1		18	
Never	79	28.8	62.1		0.564
1-2 times		15		8	0.905
3-4 times		5.4	27.6		
5 times or more		18		2	

		6.6	6.9	
			1	
			3.4	
Regular daily				
walking:		82	8	
Never		30.2	27.6	0.789
<half an hour	102	37	13	0.852
1-2 hours		81	44.8	
>2 hours		29.8	7	
		8	24.1	
		3	1	
			3.4	
Having a private				
car:	173	63	23	3.291
Yes	100	37	79.3	0.193
No			6	
			20.7	

Table (27) shows that there was no significant relation between physical activities practice and DM among males.

Table28: Physical activity practices in relation to DM among females

Characteristic		**Non Diabetics No. %**	**Diabetics No. %**	***X²*** ***P value***
		(328) 100	**(34) 100**	
Physical				
activity:		40	6	
Recently started		11.9	18.2	12.210
Start from a		44	2	0.032*
period		13.4	6.1	
Stopped		139	15	
Never		42.2	42.4	
		105	11	
		31.9	33.3	
Gem for20min.				
(weekly):	207	63.3	23	
Never		78	66.7	1.729
1-2 times		23.7	9	0.630
3-4 times		35	26.7	
5 times or more		10.7	1	
		8	3.3	
		2.3	1	
			3.3	
Regular daily				
walking:		104	7	
Never		31.5	21.9	2.329
<half an hour	49	15	5	0.507

1-2 hours	3	1	15.6	
>2 hours	172	52.5	1	
			3.1	
			21	
			59.4	
Having a private car:		119	15	1.814
Yes		36.3	43.8	0.404
No		209	19	
		63.7	56.2	

Table28: shows that the percentage of females who started physical activity recently was significantly higher among diabetics than non-diabetics.

Table29: Physical activity practices in relation to hypertension among males

Characteristic	**Non hypertensive No.**	**Hypertensive No.**	**%**	***X²***	***P value***
	%	**50**	**100**		
	252				
	100				
Physical activity:					
Recently started	9		2		
Start from a	3.6		4		6.201
period	46		7		0.102
Stopped	18.2		14		
Never	172	30	60		
	68.4	11	22		
	25				
	9.7				
Gem for20min. (weekly):					
Never	146		35		3.176
1-2 times	57.6		68.8		0.365
3-4 times	76		11		
5 times or more	29.8		22.9		
	13		3		
	5.5		6.3		
	17		1		
	7.1		2.1		
Regular daily walking:					
Never	75		15		
<half an hour	29.9		30		3.497
1-2 hours	92		23		0.312
>2 hours	36.1		46		
	76		12		
	30.3		24		
	9				
	3.7				
Having a private car:					
Yes	155		40		6.209
	61.6		79.6		0.045*

No	97	10
	38.4	20.4

Table (29) shows that the percentage of males who had a private car was significantly higher among hypertensive than non-hypertensive.

Table 30: Physical activity practices in relation to hypertension among females

Characteristic	Non hypertensive No. 306 % 100	Hypertensive No. 56 % 100	X^2	*P value*
Physical activity:	34	10		
Recently started	11.4	17.8	7.796	
Start from a	43	2	0.168	
period	14.5	3.6		
Stopped	125	28		
Never	41.4	50		
	98	16		
	32.7	28.6		
Gem for20min. (weekly):	190	41		
Never	62	72.5	4.709	
1-2 times	72	13	0.194	
3-4 times	24	23.5		
5 times or more	33	1		
	11.5	2		
	7	1		
	2.5	2		
Regular daily walking:	156	38		
Never	50.9	66.1	4.548	
<half an hour	98	12	0.208	
1-2 hours	32.0	22.6		
>2 hours	48	6		
	15.7	11.3		
	4			
	1.4			
Having a private car:	107	26		
Yes	35.4	45.5	6.665	
No	195	30	0.036*	
	64.6	54.5		

Table (30) shows that the percentage of females who had a private car was significantly higher among hypertensive than non-hypertensive.

Table31: Physical activity practices in relation to obesity among males

Characteristic	Non obese No. % 216 100	Obese No. % (86) 100	X^2 P value
Physical activity:	8	3	
Recently started	3.8	3.5	11.007
Start from a	47	6	0.012*
period	21.7	7.1	
Stopped	134	69	
Never	61.8	80.0	
	27	8	
	12.7	9.4	
Gem for20min. (weekly):			
Never	111	63	
1-2 times	53.9	73.7	10.401
3-4 times	65	19	0.015*
5 times or more	31.6	21.3	
	14	2	
	6.8	2.5	
	16	2	
	7.7	2.5	
Regular daily walking:	60	30	
Never	28.0	34.9	10.946
<half an hour	74	40	0.012*
1-2 hours	34.1	47.0	
>2 hours	74	15	
	34.1	16.9	
	9	1	
	3.8	1.2	
Having a private car: 130	62.8	65	4.075
Yes	86	79.4	0.044*
No	37.2	21	
		20.6	

Table (31) shows that the percentage of males who stopped physical activity, never practice weekly gem for 20 mint and those who had a private car were significantly higher among obese than non obese, while the percentage of males who had regular daily walking for (1-2 hours) was significantly higher among non obese than obese.

Table32: Physical activities practice in relation to obesity among females

Characteristic	Non obese	Obese	X^2	P

	No.	No.	%	*value*
	%		145	
	217		100	
	100			
Physical activity:				
Recently start	26		19	
Start from a period	12.1		13.0	11.804
Stopped	37		9	0.038*
Never	17.2		6.5	
	86		70	
	39.1		48.0	
Gem for20min. (weekly):	68		38	
	31.6		32.5	
Never				
1-2 times	125		85	
3-4 times	63.1		64.4	2.459
5 times or more	52		27	0.483
	26.3		20.5	
	17		16	
	8.6		12.1	
Regular daily walking:	4		4	
	2.0		3.0	
Never				
<half an hour	99		93	
1-2 hours	45.9		63.8	11.196
>2 hours	79		33	0.011*
	36.3		22.7	
	36		18	
	16.6		12.8	
Having a private car:	3		1	
	1.2		0.7	
Yes				
No	75		48	3.457
	34		33	0.484
	142		97	
	66		67	

Table (32) shows that the percentage of females who stopped physical activity and those who never had regular daily walking were significantly higher among obese than non obese

Table 33: Job stress exposure, stress reaction and sleeping hours (per day) in relation to DM among males

	Non diabetics	Diabetics		
Characteristic	**No.**	**No.**	**X^2**	***P value***
	%	**%**		
	273	**29**		
	100	**100**		
Job demand				
low	53	6		.024
High	19.5	20.7		0.877
	220	23		

	80.5	79.3	
Job control			
low	37	3	0.235
High	13.6	10.3	0.628
	236	26	
	86.4	89.7	
Job Social relations:	48	6	0.165
low	17.6	20.7	0.685
High	225	23	
	82.4	79.3	
Stress reaction			
Fast reaction-slow calm	50	3	
	18.3	10.4	6.180
Fast reaction-fast calm	80	13	0.186
	29.6	44.8	
Slow reaction-slow calm	114	13	
	41.2	44.8	
Slow reaction-fast calm	29		
	10.9		
Sleeping hours(per day)	62	8	
<6	22.7	27.6	10.806
6-8	202	20	0.014
>8	74.0	69.0	
	9	1	
	3.3	3.4	

Table (33) shows non-significance results as regard Job stress exposure, stress reaction and sleeping hours (per day) in relation to DM among males

Table 34: Job stress exposure, stress reaction and sleeping hours (per day) in relation to DM among females

Characteristic	**Non diabetics No. % 328 100**	**Diabetics No. % (34) 100**	***X²***	***P value***
Job demand				
low	71	7		
High	21.6	20.6		0.020
	257	27		0.886
	78.4	79.4		
Job control				
low	51	8		1.438
High	15.5	23.5		0.230
	277	26		
	84.5	76.5		

Job Social relations:	52	8		
low	15.8	23.5	1.336	
High	276	26	0.248	
	84.2	76.5		
Stress reaction				
Fast reaction-	48	3		
slow calm	14.7	9.7	13.838	
Fast reaction-	105	12	0.008	
fast calm	32.3	35.5		
Slow reaction-	157	11		
slow calm	47.5	32.3		
Slow reaction-	18	8		
fast calm	5.5	22.6		
Sleeping hours(per day)	95	9	0.628	
<6	29.1	28.1	0.731	
6-8	227	25		
>8	69.1	71.9		
	6			
	1.8			

Table (34) shows significance relation between reaction to stress and DM among females, the percentage of females whose reaction was slow reaction- slow calm significantly higher among non diabetics

Table 35: Job stress exposure, stress reaction and sleeping hours (per day) in relation to Hypertension among males

Characteristic	**Non Hypertensive No.**	**%**	**Hypertensive No.**	**%**	***X²***	***P value***
		252	**(50)**	**100**		
		100				
Job demand						
low		48		11		0.219
High		19.1		22		0.640
	203	89.9		39		
				78		
Job control						
low		34		6		0.081
High		13.5		12		0.776
		218		44		
		86.5		88		
Job Social relations:		39		15		5.924
low		15.5		30		0.015*
High		213		35		
		84.5		70		
Stress reaction						
Fast reaction-		45		7		

slow calm		17.8	14.3	3.594
Fast reaction-		75	19	0.464
fast calm		30.0	38.8	
Slow reaction-		105	22	
slow calm		41.3	42.9	
Slow reaction-		27	2	
fast calm		10.9	4.1	
Sleeping				
hours(per day)	61	24.2	9	
<6	185	73.4	18	5.826
6-8		6	37	0.120
>8		2.4	74	
			4	
			8	

Table (35**)** shows that the percentage of males with low social relationship in the work place were significantly higher among hypertensive than non hypertensive

<u>Table 36:</u> Job stress exposure, stress reaction and sleeping hours (per day) in relation to Hypertension among females

Characteristic	**Non Hypertensive No. %**	**Hypertensive No. %**	***X²***	***P value***
	306	**(56)**		
	100	**100**		
<u>Job demand</u>				
low	64	14		0.467
High	20.9	25		0.494
	242	42		
	79.1	75		
<u>Job control</u>				
low	47	12		1.278
High	15.4	21.6		0.258
	259	44		
	84.6	78.4		
<u>Job Social relations:</u>	40	20		*
low	13.3	33.9		14.58
High	266	36		0.000
	86.7	66.1		
Stress reaction				
Fast reaction-	45	5		
slow calm	14.9	9.3		
Fast reaction-	103	16		3.607
fast calm	33.6	27.8		0.462
Slow reaction-	139	29		
slow calm	45.2	51.9		
Slow reaction-	19	6		
fast calm	6..3	11.1		

Sleeping hours(per day)	89	15	
<6	29.3	27.3	0.095
6-8	212	40	0.953
>8	69.1	70.9	
	5	1	
		1.8	

(Table 36**)** shows that the percentage of females with low social relationship in the work place were significantly higher among hypertensive than non hypertensive

Table 37: Job stress exposure, stress reaction and sleeping hours (per day) in relation to obesity among males

Characteristic	**Non obese No. % 216 100**	**Obese No. % 86 100**	***X²***	***P value***
Job demand				
low	43	16		0.076
High	20	18.6		0.783
	173	70		
	80	81.4		
Job control				
low	28	12		0.053
High	13	14		0.819
	188	74		
	87	86		
Job Social relations:	34	20		
low	15.6	23.3		3.311
High	182	66		0.128
	84.2	76.7		
Stress reaction				
Fast reaction-slow	38	13		
calm	18.0	15.3		2.041
Fast reaction-fast	66	30		0.728
calm	29.9	34.1		
Slow reaction- slow	89	37		
calm	41.0	43.5		
Slow reaction-fast	23	6		
calm	11.1	7.1		
Sleeping hours(per day)	54	17		
<6	25,0	19.8		4.143
6-8	158	64		0.246
>8	73.1	74.4		
	4	5		
	1.9	5.8		

Table (37) shows non-significance results as regard Job stress exposure, stress reaction and sleeping hours (per day) in relation to obesity among males

Table 38: Job stress exposure, stress reaction and sleeping hours (per day) in relation to obesity among females

Characteristic	Non obese No. % 217 100	Obese No. % (145) 100	X^2	P value
Job demand				
low	45	33		0.210
High	20.7	22.8		0.647
	172	112		
	79.3	77.2		
Job control				
low	33	26		0.473
High	15.2	17.9		0.492
	184	119		
	84.8	82.1		
Job Social relations:	30	30		
low	13.8	20.7		2.928
High	187	115		0.087
	86.2	79.3		
Stress reaction				
Fast reaction-slow	32	18		
calm	15.0	12.6		6.011
Fast reaction-fast	74	42		0.194
calm	34.6	29.4		
Slow reaction- slow	90	75		
calm	42.1	52.4		
Slow reaction-fast	18	7		
calm	8.4	4.9		
Sleeping hours(per day)				
	63	41		
<6	29.3	28.5		0.265
6-8	149	101		0.876
>8	69.3	69.4		
	3	3		
	1.4	2.1		

Table (3^) shows non-significance results as regard Job stress exposure, stress reaction and sleeping hours (per day) in relation to obesity among females

Demographic, health risk behaviors and health characteristics of the studied group.

More than half of the studied sample were females (54.5%), nearly one third of the sample were in the age group of 40-50 years so that they spent about 15-25 years working in the scientific field to be representative for effect of work stress on health. This age group is similar to age groups of other studies which discuss health risk behaviors among adults e.g. **Gang, et al, 2004**. Nearly one third of the sample were still researchers that may indicate delaying in achieving MD degree among some specialties which represent an element of job stress in the scientific field.

21.9 % of the males and only 0.3%of females were current smokers, which is less than the national average of 33% of all men as reported by **WHO, 2002**

86.4% of all smokers believed that smoking is harmful and 79% of current smokers had previous trials for quitting. Similar findings were also reported by **jonathan, et al, 1998** who mentioned that most people who smoke are aware of the dangers and would be disposed to try to stop if effective and efficient help were available.

According to weight self image, 4.8% and 1.3% of females and males respectively thought that they are obese while assessment of obesity by BMI calculation showed that percentage of obesity is 40% and 28.5% among females and males respectively thus the participants underestimated themselves regarding obesity. Females were more interest in weight reduction. 63.5% of females either had previous trials or planned for dieting while 62.9% of males did not intend to do dieting.

Dietary habits and nutrients consumption could not be accurately evaluated because the relationships between the quantity and type of foods or nutrients consumed, and nutrient status, are complex. Most of the participants (66%) had moderate fat diet (mainly vegetable oils and animal butter), higher daily fruits consumption among females than males (53.5% vs. 32.9%), most of both groups (about 66.6%) received daily regular meals and snakes was not so prevalent in both groups. These data may indicate trial of nutritional modification and it may relate to chronic disease diagnosis or for weight control, any way it must be supported through health education programs.

Sedentary lifestyle and insufficient physical activity were prevalent among the studied sample, the majority of the sample stopped their previous physical activities and sports practice, and they did not have regular daily walking or weekly gem practice in spite that their positive attitude towards the health benefits of physical activities.

The most prevalent obstacles against physical activities were work responsibilities among males and family responsibilities among females.

Chronic diseases were common in this studied sample 33.8% and 30.5 % of males and females respectively reported one or more conditions. The most commonly reported conditions were hypertension (16.6% of males and 15.5 of females).

I-Smoking behavior in relation to history of chronic diseases:

1-Diabetes Mellitus (DM)

The present study found statically significant association between DM and smoking behavior, percentage of males with history of smoking (ex-smokers) were significantly higher among diabetics than non diabetics (31% vs. 13.7%). This could be explained in part that developing DM was a motivator to stop smoking to decrease the severity and complication of the disease or their history of smoking could be suggested to play a role in the developing of DM.

A follow up study was done by **Uchimoto et al,1999** to assess the role of cigarette smoking in the development of diabetes enrolled 6250 Japanese men aged 35-60 and free of diabetes at the start, after 4years follow-up with adjustment for multiple covariates, including age, BMI, alcohol consumption, physical activity, parental history of diabetes and the level of fasting plasma glucose, total cholesterol, triglycerides, high-density lipoprotein cholesterol and haematocrit, the relative risk of Type 2 DM among current smokers compared with non-smokers was 1.47 . Men who smoked >30 cigarettes/day had a multivariate-relative risk of 1.73 compared with non-smokers. The number of cigarettes smoked daily and the pack-year values were positively related to the development of Type 2 DM in a dose-dependent manner.

According to the present study, the percentage of current smokers was not high among diabetics and as reported by **Ford, et al, 1994** that the prevalence of smoking among people with diabetes may decrease as the duration of the disease increases, this finding may be due in part to increased mortality associated with smoking and diabetes and that clarify the need for smoking prevention among diabetic patients.

2- Hypertension (BP)

Although cigarette smoking has been reported to produce an acute rise in BP under laboratory conditions, about half of hypertensive in the present study

were non smokers this can be explained by presence of other independent variables for developing hypertension.

The major two independent determinants of incident hypertension in both genders were age and body mass index as considered by **(Radi et al, 2004)**

This negative association between smoking and BP was mentioned in one review which was written by **Savdie et al (1984).** Furthermore, several studies reported a dose-response relationship with a lower BP observed at increasing levels of cigarette consumption. In addition, some studies reported an inverse relationship between cotinine, the major nicotine metabolite, and BP in smokers **(Bolinder and Fire,1998).** However, the CARDIA follow-up study by **Dyer et al (1991)** failed to come to a consensus regarding the role of cigarette smoking in the occurrence of hypertension in generally healthy persons.

The finding that ex-smokers are more prevalent among hypertensive than non hypertensive males (30% vs. 12.4%) can be explained in part that developing hypertension was a motivator to stop smoking as it increase the severity and complication of their disease or it may imply that smoking cessation itself may result in increasing BP, even hypertension, in men through an unknown mechanism as reported by **Lee et al, (2001)** through their 4-year prospective study which suggested that the increases in BP among the quitters and current nonsmokers, especially the quitters, were generally larger than those of the current smokers. More interestingly, the increments of BP in the quitters for <1 year were very similar to those of the current smokers. Quitters for ≥1 year, however, showed larger increases in BP than did the current smokers. Furthermore, the incidence of hypertension was also higher in the group of subjects who had stopped smoking for ≥1 year, whereas the incidence was lower in the quitters for <1 year. Relative risks increased in direct relationship with the increasing periods of smoking cessation. These relationships were consistently seen as trends in both weight maintainers and gainers.

Previous cross-sectional epidemiological findings have led to the prediction of an increase in BP as a consequence of smoking cessation. However, some longitudinal studies did not show consistent results.

The Normative Aging Study done by **Seltzer, 1974** reported that greater increases in BP were observed in quitters than in those who continued to smoke. This also occurred in subgroups classified according to weight change during follow-up periods, thus being consistent with our results. However, other longitudinal studies, such as the Framingham study (**Gordon, et al, 1975**), the Evans County study **(Greene, et al, 1977)** and the Cordis Study **(Green and Hrari, 1995)** did not show significant increases in BP in subjects after smoking cessation compared with subjects who continued to smoke.

In interpretation of the change in BP after smoking cessation, the withdrawal phenomenon could explain the larger BP increase in the quitters compared with the current smokers in the present study, but it does not seem to be an appropriate explanation for the result of a linear association between the duration of quitting and the increase in BP. The other possible explanation is that after giving up smoking, the subjects feel a relative increase in stress; many smokers report themselves to be calmer and more relaxed while smoking **(Nesbitt, 1973)** and some studies have suggested that psycho physiological stress responsiveness was inhibited in habitual smokers compared with nonsmokers. **(Tsuda, et al 1996).** Therefore, if smoking modifies the pressor response to other stressful environmental stimuli, the long-term outcome of stopping smoking might be an increase in BP, consistent with observed BP differences between smokers and nonsmokers in epidemiological studies.

3-Obesity:

The present study reported that there was no significant relation between cigarette smoking and males or females obesity. The smoking behavior was nearly the same among both groups (obese and non obese). The majority of both groups (as will as the majority of the whole study sample) were non smokers.

The opinion of weight gain after smoking cessation was discussed in other studies; one of them was done by **John et al (2005)** to analyze predictors of BMI after smoking cessation. Data revealed that the number of cigarettes smoked at time of peak consumption in life contributed substantially while years of abstinence from daily smoking contributed marginally to the BMI in a general linear model. It is concluded that the contribution of smoking cessation to the BMI increase was practically negligible.

II-Dietary habits in relation to history of chronic diseases:

Nutrient intake of participants in the present study revealed that there were few differences in dietary intake between persons with and without diet-modifiable diseases included in this study (DM, hypertension and obesity) which may be due to other confounding factors that can strongly affect these associations e.g. age, gender, genetic factors ,social and environmental differences and presence co-morbid conditions.

Marian L et al (2002) reported that patients with chronic diseases (DM, hypertension and CVD) had high motivation to alter their diets to improve disease status and long-term prognosis but in spite of that motivation an

apparent lack of adherence to healthy dietary practices (e.g. low fat, high fruit and vegetable) was still present.

1-Diabetes Mellitus (DM)

The findings that most of diabetic males consumed low fat, low salt diet , most of diabetic females consumed fruits daily and both groups consumed <1 spoon of sugar per drink may be explained by that patients who diagnosed to be diabetic try to modify their diet. That opinion was also suggested by **Abioye-Kuteyi et al (2005)** after their assessment of dietary knowledge, practice and control of type 2 diabetic patients. They found that a significant proportion of subjects modified their dietary practice following diagnosis; they increased their use of food with low glycaemic index. (legumes 48.5%, cereals 90.9%)

Another study was done by **Gauthier-Chelle, et al (2004**) to compare the diet of self-declared diabetics with non-diabetics, diabetics reported lower carbohydrate intake (both men and women), increased protein intake (men only), and decreased lipid and energy intakes (women only) among diabetic patient in comparison to non diabetic. Nutritional behavior modification among diabetic are not the same between different groups or subjects and are often inappropriately. This may be explained by the fact that dietary advice stems from different sources and may be contradictory.

2-hypertension:

The present study reported that obesity and consuming diet with low fibers content could be considered risk factors for hypertension as the percentage of males and females who were considered themselves obese were significantly higher among hypertensive than non hypertensive and the percentage of males consumed daily vegetables were significantly lower among hypertensive than non hypertensive.

Low salt diet was significantly higher among hypertensive than non hypertensive both males and females and the percentage of hypertensive males who consumed brown bread and regular meals were significantly higher than percentage of hypertensive males consumed white bread and rarely regular meals. These could indicate that hypertensive subjects try to modify their diet.

As regard the association between body mass index (BMI) with blood pressure (BP) **Jousilahti P, et al, 1995** reported that BP increased linearly by increasing BMI, The proportion of hypertensive subjects was 18% among the leanest men, BMI < 20 kg/m2, but 61% among the most obese, BMI > or = 30 kg/m2. Among women these proportions were 11% and 54%, respectively.

The effects of dietary patterns on blood pressure was studied by **Svetkey LP at al,1999** through a randomized controlled trial using Dietary Approaches to Stop Hypertension (DASH) which is a combination diet rich in fruits and vegetables with low fat content. The combination diet significantly lowered systolic blood pressure in all subgroups(subgroups classification depended on race, sex, age, body mass index, years of education, income, physical activity, alcohol intake, and hypertension status) this effect was more apparent among hypertensive than non hypertensive.

These findings supported by another randomized controlled trial using DASH combination diet with low salt intake, which revealed a decrease in the mean systolic blood pressure by 7.1 mm Hg in participants without hypertension, and 11.5 mm Hg in participants with hypertension.

The reduction of sodium intake to levels below the current recommendation of 100 mmol per day and the DASH diet both lower blood pressures substantially, with greater effects in combination than singly.

Long-term health benefits will depend on the ability of people to make long-lasting dietary changes and the increased availability of lower-sodium foods. **(Sacks FM, et al, 2001)**

3-Obesity

Sensitivity and specificity of self image as an indicator of obesity

		According to calculated BMI	
		Obese males	Non obese males
	Obese males	4	_____
Screening by			
Self image	Non obese males	82	216
	Total	86	216

Sensitivity = 4/86 = 4.6% Specificity = 216/216 = 100%

According to calculated BMI

		Obese females	Non obese females
	Obese females	16	1
Screening by Self image	Non obese females	129	216
	Total	145	217

Sensitivity = 16/145= 11% Specificity = 216/217 = 100%

The sensitivity of weight self image as an indicator of obesity was very low, thus it is not an accurate to method for assessment of obesity. Weight self image was slightly more sensitive to reflect the real BMI among females than males, so they may have higher motivation to engage in a weight control program than males.

Apart from the high fat diet among obese males, nutritional pattern was nearly the same among both groups (obese and non obese). So high fat diet was the only nutritional risk factor could be detected for development of obesity among the studied group.

The high percentage of obesity among them is most likely related to their sedentary life style, or other non behavioral risk factors e.g. genetic, environmental risk factors.

Simoes et al, (1995) reported that dietary fat and physical activity were strongly and inversely associated when examined in a population-based probability sample of 29,672 adults in the 1990 Behavioral Risk Factor Surveillance System.

III-Physical activity in relation to health status:

1-DM

The present study did not find significance relation between DM and physical activity exercise practice was generally not prevalent among both diabetic and none diabetic either males or females. Many obstacles for physical activity practice were mentioned by the study subjects.

On contrary, **Marian et al(2002)** reported large differences in exercise patterns of diabetics compared to non-diabetics, participants with diabetes exercised at 25% decreased intensity (as measured in metabolic equivalents) compared to non-diabetics. These findings were also reported by **Edege and Zheng(2002**) as higher prevalence of insufficient physical activity among diabetics than non diabetics (66% vs. 56%) was founded. They considered that finding as one the risk factors which increase prevalence of CVD among diabetic than none diabetic.

Moreover, significant and independent roles of physical inactivity and psychological stress factors were associated with the development of diabetes in prospective study done by **Ramachandran et al (1999)**. They applied the primary prevention of diabetes programme on 187 adult (M:F 112:75) of normal glucose tolerance, adherence to exercise and other preventive measures was poor in the individuals who developed DM compared to others, also high scores of psychological stress showed strong association with development of diabetes.

2-Hypertension

The current study could not clarify the relation between physical activity practice and hypertension. There were few differences in physical activity practice between persons with and without hypertension, and generally the practice was low among both groups. On the other hand, analyses from other cross-sectional studies revealed that physical activity is inversely associated with BP level and the prevalence of hypertension**.(Hu G ,et al, 2003)**

The percentage of males and females who had a private car among hypertensive was significantly higher than among normotensive that may indicate the role of sedentary life style in developing hypertension.

A meta-analysis was done by **Whelton et al (2002**) which included 54 clinical trials, to assess the effect of aerobic exercise on BP, Aerobic exercise was associated with a significant reduction in mean systolic BP by 3.8 mm Hg and diastolic BP by 2.6 mm Hg. A reduction in BP was associated with aerobic exercise in both hypertensive and normotensive subjects, and both overweight and normal weight participants. Because the BP reduction related to aerobic exercise did not significantly differ among trials with various types, frequencies, and intensities of exercise intervention, the result from this meta-analysis indicated that all forms of exercise seemed to be effective in reducing BP.

A prospective study showed that men who did not participate in vigorous exercise had a 35% higher incidence of hypertension than those who were more active. **(Paffenbarger et al, 1983).** That finding was also supported by **Blair et al (1984)** who reported a 52% excess risk of hypertension for people with low levels of physical fitness when compared with highly fit persons**.**

Another Finnish study found a reduced risk for hypertension in men participating in vigorous physical activity**. (Haapanen et al, 1997)**

A Japanese prospective study showed that the duration of walking to and from work and regular leisure time physical activity at least once a week decreased the risk for hypertension in Japanese men**.(Hayashi et al, 1999)**

Only two prospective studies revealed no significant association between physical activity and the risk of hypertension among women. **(Pereira et al, 1999) and (Haapanen et al, 1997)**

3-Obesity

A significant inverse association between BMI and physical activity was found in the present study and may indicate the role of insufficient physical activity practice and sedentary life style in development of obesity. The percentage of males who stopped physical activity, never practice weekly gem for 20 mint, had a private car were significantly higher among obese **than** non obese. As regards the female group, the percentage of females who started physical activity from a period , had regular daily walking for (1-2 hs) were significantly higher among non obese than obese.

Martinez et al (**1999)** supported these findings through their cross section study among the adult population of the European Union, they reported independent associations of leisure-time physical activity (inverse) and amount of time spent sitting down (direct) with BMI.

A prospective cohort study was done by **Hu et al (2003)** to follow up the effect of lifestyle habits on the development of obesity and DM among a group of adult non obese American females. They reported that each 2-h/d increment in TV watching was associated with a 23% increased risk of obesity and a 14% increased risk of diabetes; each 2-h/d increment in sitting at work was associated with a 5% increase in obesity and a 7% increase in diabetes. In contrast, standing or walking around at home (2 h/d) was associated with a 9% reduction in obesity and a 12% reduction in diabetes. Each 1 hour per day of brisk walking was associated with a 24% reduction in obesity and a 34% reduction in diabetes. They estimated that 30% of new cases of obesity and 43% of new cases of diabetes could be prevented by adopting a relatively

active lifestyle (<10 h/wk of TV watching and > or =30 min/d of brisk walking).

According to **Schaller et al (2005)** findings, obese subjects showed lower energy expenditure in the categories of sports, occupation and total activity, while the time spent with TV/PC during leisure time was highest. A statistically significant association between obesity and TV/PC use during leisure time was found while sports activity was inversely related to obesity risk.

IV- Job stress in relation to health status:

The only detected relationship between job stress and health status of the participants was the significant relation between low social relationship and hypertension. The percentages of males and females who had low social relationship in the work place were significantly higher among hypertensive than non hypertensive. Other elements of job strain as low job control and high job demand) not seemed to be associated with hypertension.

Tsutsumi et al (2001) supported the relation between job strain and hypertension in a multicentre community based cohort study of Japanese working people. Among men, the level of job strain (the ratio of psychological job demands to job control) correlated with the prevalence of hypertension. The excess prevalence amounted to 18% after adjustment for age, employment (white collar *v* blue collar), and marital status, family history of hypertension, cigarette smoking, alcohol intake, physical activity, and BMI. As in other study, only a combination of high demands and low control was related to the prevalence of hypertension. The magnitude of the association seemed to be strongest for the lower social classes, where the level of job strain was higher than for their respective counterparts, and less so in the older age group. For the women in this sample, job strain was not associated with hypertension. (**Schnall et al, 1992)**

Conclusion

The results of this study have demonstrated that some health risk behaviors are considerably prevalent among scientific professionals working at National Research Centre and they also have stressful job life.

Among these behaviors the most prevalent one was the inactive life style among both males and females. Others were smoking, inappropriate dietary habits and unsafe behaviors that may cause unintentional injuries

Sedentary life plays a major role for the high percentage of obesity among the studied group which in turn being a main risk factor for many chronic diseases. Reducing the rates of obesity and physical inactivity may be very important for the health, considering their association with diabetes and hypertension.

Diet-modifiable chronic diseases included in this study (DM, hypertension and obesity) may be a motivator for diseased subjects to try to alter their dietary habits but they are in need for support to achieve appropriate and constant change.

Gender difference was observed as regard attitude and practice towards dieting, females are more interest to maintain weight loss through dieting regimen. They are also more oriented about their weight self image than males. So, weight loss programs could target females at first to achieve apparent success.

In spite of the majority of the current smokers are oriented about smoking health hazards, it is difficult for them to stop smoking. They need smoking cessation programs that discuss and analyze this difficulty. Individuals who have achieved different levels of success to stop smoking could act as role models in these programs.

Scientific research field carries many sources of stress to its professionals mainly the high job demand. That stress exposure may negatively affect their health status either directly or through behavioral change.

Thus scientific professionals are in need for health promotion programs taken in concern their work nature as well as their individual health risk behaviors. Moreover, wok place is a good field to apply such programs.

Continued health improvement will depend largely on changes in individual behavior.

Various kinds of preventive health behaviors could be promoted by health education.

Considerable work needs to be done to provide a convincing evidence base on which to build work place intervention programs around risk behavior. However, sufficient evidence exists to suggest that effort in this area may be beneficial for the health of the workers.

Recommendations

Intervention programs for health promotion among scientific professionals are recommended. The main objectives of these programs should focus on decreasing behavioral risk factors for chronic diseases.

Intervention programs should be directed in two parallel lines:

1- Health education for wells and at –risk population (consumer H.E.) for helping health maintenance.

2- Health education for subjects with known chronic conditions mainly obesity, DM and hypertension (patient education) aiming for prevention of complications and decrease disease progression.

Work place is a good community for applying such programs and presence of health education unit managed by trained health educators inside the work site is recommended.

The recommended activities of this unit should be:

1-Gathering data about behaviors that endanger health.

2 Determining which health-related behavior needs immediate attention and subjects who are at highest risk.

3-Informing the workers about the dangers of certain behaviors and the benefits of change such behaviors by generally providing its data through brochures, pamphlets and boosters as well as carefully planned lectures and face to face meeting.

4-Working as counseling centre providing availability of individual counsels for users through phone or through personal interview.

5- Using the survey data as the basis for designing intervention programs that will encourage the workers to stop health risk behaviors. Such programs should have several objectives:

a- Increasing individuals' physical activity levels. Establishment of aerobic hall inside the work place is recommended to promise approaches for physical activities practice

b- Weight control to prevent weight gain, encourage weight reduction for obese persons and help all individuals to maintain average BMI. The nutritional unit should be encouraged to manufacture types of food with high nutritional value and fewer calories to be used as supportive factors for dieting regimen.

c- Smoking cessation among current smokers and prevent their relapse. Availability of clinic for smoking cessation with trained specialists able to describe medications to stop smoking is recommended.

d- Regular medical check up service for diagnosing diseases early. Medical check up for scientific professionals should be supported financially by their work place at least annually.

6 Monitoring the effectiveness of intervention programs and progress toward modifying behaviors and disease prevention goals.

Intervention should not be directed only to the subjects but it should also involve the work environment as there is interaction between wok environment and personal behaviors

Increasing level of social support (e.g. good communication channels, satisfactory work relationships, supportive organizational culture) is important to have healthy work environment.

Occupational safety guidelines should be available for all researchers and applying occupational safety measures inside work place is so important to prevent exposure to different laboratory hazards.

The activity of this unit should extend to educate the public, the health community, and policymakers about disease prevention and to support community policies that promote health and prevent disease.

Programs that encourage health promoting behaviors and fight behaviors that endanger health should be applied for many populations in different communities and work places.

Summary

The role of individual behavior as a major risk factor for chronic diseases has been highlighted through many studies all over the world. It is more valuable to concern this relation among working adults specially those with certain type of works known to experiences high level of stress as job stress, either singly or through its impact on individual behavior, is believed to affect the health of the workers.

Among these behaviors which may cause health risks are smoking, bad dietary habits and insufficient physical activity practices, Abusing alcohol or other drugs, unsafe behaviors that may cause unintentional injuries

Aim of work

The aim of this study is to determine the prevalence of heath risk behaviors among scientific professionals in National Research Centre and to find the possible relation between their medical history and some of the studied risk behaviors.

Subjects and Methods

A cross sectional study was applied to achieve the purpose of the study.

The study sample was 664 scientific professionals working in 13 different divisions in NRC drawn from a population of 2546 staff professionals.

Each participant filled a designed self administrated questionnaire including personal data, different health risk behaviors (smoking, dietary habits, alcohol and drug abuse, physical activity practices and history of injuries), exposure to job stress and past history of chronic diseases.

Anthropometric measurements including body weight and height were assessed to calculate body mass index (weight [kg]/height square [m^2]). According to NIH, 1999 subjects whose BMI greater than or equal to 30.0 kg/m^2 are considered obese. Blood pressure was measured for all subjects to detect hypertensive cases and according to Radi et al, 2004 measurement on separate occasions was done to avoid overestimation. Persons were considered hypertensive if they had systolic blood pressure $\geq$ 140 mmHg or diastolic blood pressure $\geq$ 90mmHg all through 3 separated measurements (NIH, 1997), or if they are known to be hypertensive and receiving antihypertensive medication.

Data were analyzed on personal computer using spss program version 10 and suitable statistical data were applied.

Results

It was evident from the current study that the scientific professionals working in NRC had inactive lifestyle. The majority of the sample was not engaged in physical activity and stopped their previous sports practice. They did not practice daily walking or weekly gem regularly in spite of their positive attitude towards the health benefits of physical activities. Work responsibilities were the most common obstacles against practicing physical activity.

As regard dietary habits, most of the studied population especially those with chronic illness tried to modify their dietary habits as most of them consumed moderate fat diet (mainly vegetable oils and animal butter), moderate salt, drinking tea and coffee within the moderate range, receiving daily regular meals and not currently receiving snacks and fast food.

About one fifth of males were current cigarette smokers vs. 0.3% of females. The majority of the current smokers have intention to stop smoking and most of them stopped actually but returned. Knowledge about health hazards of smoking was the strongest motivation for smoking cessation among both current and ex-smokers.

The majority of the studied sample was careful about following safety rules when dealing with instruments inside home and at work. The history of road injuries was higher among males while the history of indoor injuries was higher among females.

According to scoring of job content questionnaire, the studied population has an active form of job stress as the majority of them recorded positive answers for high job demand and high job control items; they also recorded low social support.

About 1/3 of the studied group suffer from one or more chronic disease mostly, Hypertension (16%) and DM (9.5%) with nearly similar percentage among males and females. Obesity percentage is higher among females than males (40% vs. 28.5%). Most of the studied group does not have medical check up for diagnosing diseases early.

As regards the relation between health risk behaviors and history of chronic diseases, the following significant relations were found between:

1-History of smoking (ex-smokers) and DM among males.

2-History of smoking (ex-smokers) and hypertension among males and females.

3-Consuming low fat, low salt diet and <1 spoon of sugar per drink and DM among males.

4-Consuming fruits daily and <1 spoon of sugar per drink and DM among females.

5-Consuming low salt diet, self-image as obese and hypertension among males and females.

6- Consuming high fat diet and obesity among males.

7- Recently start physical activity and DM among females.

8-Low physical activity practices and obesity among males and females.

9-Car driving and hypertension among males and females.

10-Low social relationship and hypertension among males and females.

Recommendations

Intervention programs for health promotion among scientific professionals are recommended. The main objectives of these programs should focus on decreasing behavioral risk factors for chronic diseases.

Intervention programs should be directed in two parallel lines:

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The activity of this unit should extend to educate the public, the health community, and policymakers about disease prevention and to support community policies that promote health and prevent disease.

Programs that encourage health promoting behaviors and fight behaviors that endanger health should be applied for many populations in different communities and work places.

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دراسة السلوكيات الضارة بالصحة بين العاملين في مجال البحث العلمي

توطئة للحصول علي درجة الماجستير في الصحة العامة رسالة

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٢٠٠٥

الملخص العربى

إن دور السلوك الشخصي كعامل خطورة رئيسي للأمراض المزمنة قد تم إلقاء الضوء عليه من خلال دراسات عديدة
علي مستوى العالم .
و إن إجراء مثل هذه الدراسات بين العاملين البالغين يزيد من قيمتها وخاصة بين ممن يشغلون الوظائف يتعرضون من خلالها لمستوى عالي من الضغط النفسى حيث أنه من المعتقد أن ضغوط العمل تؤثر علي صحة العاملين إما كعامل مستقل أو من خلال تأثيرها علي السلوك الشخصي.
ومن بين هذه السلوكيات التى تسبب مخاطر صحية التدخين-العادات الغذائية السيئة-قلة ممارسة الرياضة-تناول الكحوليات والمخدرات سلوكيات تزيد من التعرض للإصابات.
وهدف هذه الدارسة هو تحديد مدي انتشار هذه السلوكيات الضارة بالصحة بين العاملين في مجال البحث العلمي في المركز القومي للبحوث و إيجاد العلاقة المحتملة بينها وبين تاريخهم الصحي .تضم عينة البحث ٦٦٤ من العاملين في مجال البحث العلمي يعملون في ١٣ تخصص مختلف داخل المركز القومي للبحوث الذي يضم ٢٥٤٦ من أعضاء هيئة البحوث. وقد أجريت دراسة مقطعية عرضية لتحقيق هذا الهدف.
وقد قام كل مشارك بملء استبيان للرأي تم تصميمه ليحتوي علي البيانات الشخصية للأفراد وأسئلة عن السلوكيات الضارة بالصحة التدخين-العادات الغذائية السيئة-قلة ممارسة الرياضة-تناول الكحوليات والمخدرات-سلوكيات تزيد من التعرض للإصابات.
وكذلك استبيان حول ضغوط العمل و عن الحالة الصحية للعاملين.
وقد تم القيام بعمل قياسات للوزن والطول لإيجاد كتلة الجسم وتبعا للمراجع العلمية فإن كانت كتلة الجسم تساوي ٣٠ أو أكثر لشخص ما فإن هذا الشخص يعانى من السمنة . وكذلك تم قياس ضغط الدم لتشخيص من يعانون من ارتفاع ضغط الدم وتم تعريفهم تبعا للمراجع العلمية بأنهم الأشخاص الذين ضغط الدم لديهم يساوي أو يزيد عن١٤٠\ ٩٠ من خلال ٣ قياسات منفصلة وينضم إليهم الأشخاص المعروف أنهم يعانون من ارتفاع ضغط الدم ويتناولون علاجا لتقليل ضغط الدم .

النتائج :
أثبتت الدراسة أن العاملين في مجال البحث العلمي في المركز القومي للبحوث يعيشون نمط حياة غير نشط . فإن الغالبية العظمي منهم (٧٦,٢%) لم يمارسوا أي أنشطة رياضية أو توقفوا عما كانوا يمارسونه وأغلبهم لا يمارس المشى بصورة يومية منتظمة أو التمرينات الرياضية بمعدل أسبوعي ثابت وقد كانت مسئوليات العمل من أهم العوامل التي تعوقهم عن ممارسة الرياضة .
أما عن العادات الغذائية فإن معظم المشاركين حاولوا تعديل عاداتهم الغذائية وخاصة من يعانون من أمراض مزمنة مثل ارتفاع ضغط الدم والبول السكرى والسكر كانوا أكثر حرصا على تناول غذاء يحتوي علي كمية قليلة من الدهون أغلبها سمن طبيعي وزيوت نباتية) وكذلك التقليل من الأملاح والسكريات و أغلب أفراد هذه العينة البحثية يتناولون وجبات غذائية منتظمة أما الوجبات الجانبية والسريعة لم تكن منتشرة بينهم .
وتصل نسبة المدخنين بين الرجال إلي حوالي ٢١,٩% مقابل ٠,٣% بين السيدات والغالبية العظمي من المدخنين لديهم الرغبة في الإقلاع عن التدخين ومعظمهم قد قام بذلك بالفعل ولكنه عاود التدخين .وإن معرفة أثار التدخين الضارة بالصحة كانت من أقوى الدوافع للإقلاع عن التدخين بين المدخنين السابقين وكذلك بين المدخنين حاليا .
أما عن إتباع تعليمات الأمان عند التعامل مع الأجهزة في المنزل أو في العمل فإن الغالبية العظمي من أفراد هذه العينة البحثية يحرصون على أتباعها .
وبالنسبة للتعرض للإصابات فقد كان الرجال أكثر عرضه لإصابات الطرق في حين أن نسبة الإصابات داخل المنزل كانت أعلي بين السيدات.
وتبعا لتقييم استبيان الرأي حول ضغوط العمل فإن العاملين فى مجال البحث العلمى يمثلون للنموذج النشط من ضغوط العمل حيث أن أغلبهم سجل أن متطلبات العمل كثيرة ولكن لديهم القدرة علي التحكم

في كيفية أدائها وقد سجلوا البعض منهم أن التعامل مع الآخرين داخل العمل ليس علي المستوى الذي يرضيهم.

أما عن حالتهم الصحية فإن حوالي ٣\١ هذه العينة البحثية يعانون من واحد أو أكثر من الأمراض المزمنة وأغلبها كانت البول السكري (٩,٥%) وارتفاع ضغط الدم (١٦%) بنسبة شبه متقاربة بين الرجال والنساء . في حين بلغت نسبة السمنة بين النساء ٤٠% وبين الرجال ٢٨,٥% .

أما عن العلاقة بين السلوكيات الضارة بالصحة وبين هذه الأمراض المزمنة الموجودة بين أفراد العينة البحثية فقد وجدت بعض العلاقات ذات الدلالة الإحصائية بين :-

التدخين سابقا ومرض السكر بين الرجال .

التدخين سابقا وارتفاع ضغط الدم بين الرجال والسيدات .

قلة تناول الدهون والأملاح والسكريات ومرض السكر بين الرجال .

تناول الفاكهة يوميا والتقليل من السكريات ومرض السكر بين السيدات .

السمنة (تبعا للتقييم الشخصي) والتقليل من الأملاح في الغذاء وارتفاع ضغط الدم بين الرجال والسيدات .

زيادة الدهون في الغذاء والسمنة بين الرجال .

البدء حديثا في ممارسة الرياضة ومرض السكر بين السيدات .

قلة ممارسة الرياضة والسمنة بين الرجال والسيدات .

قيادة السيارات وارتفاع ضغط الدم بين الرجال والسيدات .

العلاقات الشخصية داخل العمل وارتفاع ضغط الدم بين الرجال والسيدات .

التوصيات :

يقترح عمل برامج لتحسين الصحة بين العاملين في مجال البحث العلمي ويجب أن تركز الأهداف الرئيسية لهذه البرامج علي تقليل عوامل الخطورة السلوكية للأمراض المزمنة وكذلك يجب أن توجه هذه البرامج إلي كل من :-

الأشخاص الأصحاء والمعرضين لعوامل الخطورة للأمراض المزمنة للوقاية من الإصابة بالأمراض المزمنة .

الذين يعانون من أمراض مزمنة بهدف التقليل من تدهور حالتهم الصحية.

وإن مكان العمل يمثل مجتمع جيد لتطبيق هذه البرامج ومن المقترح إيجاد وحدة تثقيف صحي يديرها مدربين داخل مكان العمل .

ومن الأنشطة المقترحة لهذه الوحدة :-

جمع البيانات حول السلوكيات التي تهدد الصحة .

تحديد السلوكيات المتعلقة بالصحة التي تحتاج إلى تدخل سريع وكذلك الأفراد الأكثر عرضة للخطورة .

تعريف العاملين بخطورة هذه السلوكيات وفوائد تغييرها من خلال الملصقات والاستمارات التثقيفية وكذلك من خلال المحاضرات العامة ذات الإعداد الجيد واللقاءات الشخصية .

أن تكون مركز لتقديم النصائح للراغبين من خلال التليفون أو المقابلات الشخصية .

استخدام المعلومات التي تم تجميعها في تصميم برامج تشجع العاملين علي التعرف علي ممارسة السلوكيات الضارة بالصحة ويكون في مقدمة أهدافها :-

زيادة مستوى ممارسة الرياضة لدي الأفراد ويقترح إنشاء قاعة ألعاب رياضية داخل مكان العمل .

برامج للتحكم في الوزن تشجع علي تقليل الوزن بين من يعانون من السمنة ومساعدة الآخرين علي الحفاظ علي أوزانهم في حدود المعدل الطبيعي ومنع زيادتها ويقترح تشجيع وحدة التغذية داخل المركز علي إنتاج أنواع من الأغذية ذات قيمة غذائية عالية وأقل نسبة من السعرات الحرارية تساعد في النظام الغذائي لتقليل الوزن .

برامج للإقلاع عن التدخين بين المدخنين ومنع معاودته ويقترح وجود عيادة للإقلاع عن التدخين يديرها متخصصين قادرين علي وصف الأدوية المناسبة لكل حالة .

يجب أن يكون الكشف الدوري الشامل مدعم ماديا من جهة العمل علي الأقل سنويا للعاملين في مجال البحث العلمي .

هذه البرامج يجب ألا توجه للأفراد فقط ولكن توجه إلي بيئة العمل لأن هناك تفاعل بينها وبين السلوكيات الشخصية
و إن زيادة مستوى المساندة الإجتماعية من خلال إيجاد قنوات اتصال وعلاقات شخصية مرضية و مساندة من الإدارةالتنظمية عامل هام جدا لإيجاد بيئة عمل صحية.
يجب أن تكون ارشادات السلامة المهنية معروفة لجميع الباحثين و ان تطبق داخل المعامل للوقاية من التعرض للمخاطر المختلفة داخل المعامل.
أنشطة وحدة التثقيف الصحي يجب أن تمتد لتشمل التثقيف الصحي للعامة ولصحة المجتمع والعاملين في مجال الوقاية من الأمراض لتدعيم إستراتيجيات المجتمع التي تهدف لتحسين الصحة والوقاية من الأمراض
كما يجب تطبيق مثل هذه البرامج بين مختلف التجمعات و في أماكن العمل المختلفة.

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