RESEARCH ARTICLE

BMI AND ITS IMPACT IN THE INCIDENCE OF COMMON CHRONIC DISEASES.

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Manuscript Info	*Abstract*

Background: Overweight prevalence has risen dramatically in recent decades. While it is known that overweight is associated with a wide range of chronic diseases, the cumulative burden of chronic diseases in the population associated with overweight and obesity is not well quantified.

Material and Methods: We have analyzed 10 surveys that are suitable to our objectives. Of them two cross-sectional study (follow-up survey), Two epidemiological health surveys, One multistage survey, Two follow-up Surveys and one retrospective study.

Results: Screen time was positively related to (BMI) in boys (p=0.002), who spent more time in front of the Computer than girls did (p<0.001). In KSA, the prevalence of Type II DM was 9.7% and 7.1%, obesity was 13.1% and 20.3% and overweight was 27.2% and 25.2% in the total men and women. When the Type II DM Population was separated from the non-diabetics, the prevalence of obesity was 39.3% among diabetic women compared to 18.5% among non-diabetic women, the prevalence of obesity was lower among men compared to the women, and diabetic men had higher prevalence than non-diabetic males (20.7% and 12.1%, respectively). The risk of developing diabetes, hypertension, heart diseases, and stroke increased with severity of overweight among women and men.

Conclusion: Obesity considered as a major etiological factor in development of Type II DM in Saudis. High BMI is a determinant of a sedentary lifestyle. During 10 years of follow-up, the incidence of diabetes, hypertension, heart disease, and stroke (men only) increased with degree of overweight in men and women.

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Introduction:-

Overweight and obesity prevalence has risen dramatically in recent decades. While it is known that overweight and obesity is associated with a wide range of chronic diseases, the cumulative burden of chronic disease in the population associated with overweight and obesity is not well quantified. The aims of this paper were to examine the associations between BMI and chronic disease prevalence; to calculate Population Attributable Fractions (PAFs) associated with overweight and obesity; and to estimate the impact of a one unit reduction in BMI on the population prevalence of chronic disease Patients whose weight falls into a higher category of body mass index (BMI) and obesity have an increased risk for multiple chronic diseases, according to a study published online October 16 in Family Practice. Younger people who are obese have similar chronic disease profiles as older, nonobese people.

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Objectives:-
1. To determine the screen time impact on BMI
2. To determine the prevalence of overweight and obesity at Saudis male and female
3. To determine the effect of sedentary lifestyle on BMI.
4. To determine the impact of increased BMI on the incidence of common chronic diseases .

Literature Review:-
Leisure time computer use and adolescent bone health-findings from the Tromsø Study, Fit Futures: a crosssectional study.

Objectives:-
Low levels of physical activity may have considerable negative effects on bone health in adolescence, and increasing screen time in place of sporting activity during growth is worrying. This study explored the associations between self-reported screen time at weekends and bone mineral density (BMD).

Design:-
In 2010/2011, 1038 (93%) of the region's first-year upper-secondary school students (15-18 years) attended the Tromsø Study, Fit Futures 1 (FF1). A follow-up survey (FF2) took place in 2012/2013. BMD at total hip, femoral neck and total body was measured as g/cm2 by dual X-ray absorptiometry (GE Lunar prodigy).

Lifestyle variables were self-reported, including questions on hours per day spent in front of television/computer during weekends and hours spent on leisure time physical activities. Complete data sets for 388/312 girls and 359/231 boys at FF1/FF2, respectively, were used in analyses. Sex stratified multiple regression analyses were performed.

Results:-
Many adolescents balanced 2-4 h screen time with moderate or high physical activity levels. Screen time was positively related to body mass index (BMI) in boys ($p=0.002$), who spent more time in front of the computer than girls did ($p<0.001$). In boys, screen time was adversely associated with BMDFF1 at all sites, and these associations remained robust to adjustments for age, puberty, height, BMI, physical activity, vitamin D levels, smoking, alcohol, calcium and carbonated drink consumption ($p<0.05$). Screen time was also negatively associated with total hip BMDFF2 ($p=0.031$). In contrast, girls who spent 4-6 h in front of the computer had higher BMD than the reference (<2 h).

Conclusions:-
In Norwegian boys, time spent on screen-based sedentary activity was negatively associated with BMD levels; this relationship persisted 2 years later. Such negative associations were not present among girls. Whether this surprising result is explained by biological differences remains unclear.

Correlates of Total Sedentary Time and Screen Time in 9-11 Year-Old Children around the World: The International Study of Childhood Obesity, Lifestyle and the Environment

Purpose:-
Previously, studies examining correlates of sedentary behavior have been limited by small sample size, restricted geographic area, and little socio-cultural
variability. Further, few studies have examined correlates of total sedentary time (SED) and screen time (ST) in the same population. This study aimed to investigate correlates of SED and ST in children around the world.

Methods:-
The sample included 5,844 children (45.6% boys, mean age = 10.4 years) from study sites in Australia, Brazil,Canada, China, Colombia, Finland, India, Kenya, Portugal, South Africa, the United Kingdom, and the United States. Child- and parent-reported behavioral, household, and neighborhood characteristics and directly measured anthropometric and accelerometer data were obtained. Twenty-one potential correlates of SED and ST were examined using multilevel models, adjusting for sex, age, and highest parental education, with school and study site as random effects. Variables that were moderately associated with SED and/or ST in univariate analyses

(p<0.10) were included in the final models. Variables that remained significant in the final models (p<0.05) were considered correlates of SED and/or ST.

Results:-
Children averaged 8.6 hours of daily SED, and 54.2% of children failed to meet ST guidelines. In all study sites, boys reported higher ST, were less likely to meet ST guidelines, and had higher BMI z-scores than girls. In 9 of 12 sites, girls engaged in significantly more SED than boys. Common correlates of higher SED and ST included poor weight status, not meeting physical activity guidelines, and having a TV or a computer in the bedroom.

Conclusions:-
In this global sample many common correlates of SED and ST were identified, some of which are easily modifiable (e.g., removing TV from the bedroom), and others that may require more intense behavioral interventions (e.g., increasing physical activity). Future work should incorporate these findings into the development of culturally meaningful public health messages.

Obesity in Saudi Arabia:-
Objectives:-
Obesity and overweight are well known risk factors for coronary artery disease (CAD), and are expected to be increasing in the Kingdom of Saudi Arabia (KSA) particularly among females. Therefore, we designed this study with the objective to determine the prevalence of obesity and overweight among Saudis of both gender, between the ages of 30-70 years in rural as well as in urban communities. This work is part of a major national project called Coronary Artery Disease in Saudis Study (CADISS) that is designed to look at CAD and its risk factors in Saudi population.

Methods:-
This study is a community-based national epidemiological health survey, conducted by examining Saudi subjects in the age group of 30-70 years of selected households over a 5-year period between 1995 and 2000 in KSA. Data were obtained from body mass index (BMI) and were analyzed to classify individuals with overweight (BMI = 25-29.9 kg/m2), obesity (BMI Ñ30 kg/m2) and severe (gross) obesity (BMI Ñ40 kg/m2) to provide the prevalence of overweight and obesity in KSA.

Results:-
Data were obtained by examining 17,232 Saudi subjects from selected households who participated in the study. The prevalence of overweight was 36.9%. Overweight is significantly more prevalent in males (42.4%) compared to 31.8% of females (p<0.0001). The age-adjusted prevalence of obesity was 35.5% in KSA with an overall prevalence of 35.6% [95% CI: 34.9-36.3], while severe (gross) obesity was 3.2%. Females are significantly more obese with a prevalence of 44% than males 26.4% (p<0.0001).

Conclusions:-
Obesity and overweight are increasing in KSA with an overall obesity prevalence of 35.5%. Reduction in overweight and obesity are of considerable importance to public health. Therefore, we recommend a national obesity prevention program at community level to be implemented sooner to promote leaner and consequently healthier community.

Obesity and overweight in Type II diabetes mellitus patients in Saudi Arabia:-
Objective:-
Non-insulin dependent diabetes mellitus (Type II) and obesity, occur at a high prevalence in the Saudi population. Since obesity is one of the factors contributing to insulin resistance and hence predisposition to hyperglycemia, this study was designed to investigate the prevalence of obesity in Saudi Type II diabetes mellitus and non-diabetic populations.

Methods:-
This study was conducted on 1419 adult individuals (age > 14 years) suffering from Type II diabetes mellitus (men = 711 and women = 708) and 13241 non-diabetic individuals (men = 5451 and women = 7790) to determine the prevalence of overweight and obesity using the Body Mass Index level. The study group belonged to different parts of the country and were volunteers in a well designed screening protocol to screen for diabetes mellitus in Saudi

nationals. Household screening was conducted. Fasting and 2 hour post-glucose load blood glucose levels were measured and World Health Organization criteria was applied to classify the population as diabetic or non-diabetic. Height and weight were recorded and used to calculate Body Mass Index. Considering Body Mass Index values of 25-29 as overweight and 30 or over as obesity, the prevalence of overweight and obesity were calculated separately in the man and woman diabetic and non-diabetic populations.

Results:-
In the total population, the prevalence of Type II diabetes mellitus was 9.7% and 7.1%, obesity was 13.1% and 20.3% and overweight was 27.2% and 25.2% in the total men and women. When the Type II diabetes mellitus population was separated from the non-diabetics, the prevalence of obesity was 39.3% among diabetic women compared to 18.5% among non-diabetic women (p < 0.0001). The prevalence of obesity was lower among men compared to the women, and diabetic men had higher prevalence than non-diabetic males (20.7% and 12.1%, respectively) (p < 0.001). On the other hand, overweight men (37%) were more prevalent than the women (29.7%) in the diabetic group and the men and women in the non-diabetic group 25.9% and 24.8%, respectively

(p < 0.001). The population was stratified on the basis of the different provinces to which they belonged and the prevalence of both obesity and overweight showed significant differences in the different provinces where the highest prevalence of obesity was in the diabetic females in the Eastern province, while the lowest prevalence was in the South-western province.

Conclusion:-
The results of this study suggest that obesity may be considered as a major etiological factor in development of Type II diabetes mellitus in Saudis.

Obesity and Associated Factors —Kingdom of Saudi Arabia, 2013:-
Introduction:-
Data on obesity from the Kingdom of Saudi Arabia (KSA) are nonexistent, making it impossible to determine whether the efforts of the Saudi Ministry of Health are having an effect on obesity trends. To determine obesity prevalence and associated factors in the KSA, we conducted a national survey on chronic diseases and their risk factors.

Methods:-
We interviewed 10,735 Saudis aged 15 years or older (51.1% women) through a multistage survey. Data on sociodemographic characteristics, health-related habits and behaviors, diet, physical activity, chronic diseases, access to and use of health care, and anthropometric measurements were collected through computer-assisted personal interviews. We first compared sociodemographic factors and body mass index between men and women. Next, we conducted a sex-specific analysis for obesity and its associated factors using backward elimination multivariate logistic regression models. We used SAS 9.3 for the statistical analyses and to account for the complex sampling design.

Results:-
Of the 10,735 participants evaluated, 28.7% were obese (body mass index $\geq$30 kg/m2). Prevalence of obesity was higher among women (33.5% vs 24.1%). Among men, obesity was associated with marital status, diet, physical activity, diagnoses of diabetes and hypercholesterolemia, and hypertension. Among women, obesity was associated with marital status, education, history of chronic conditions, and hypertension.

Conclusion:-
Obesity remains strongly associated with diabetes, hypercholesterolemia, and hypertension in the KSA, although the epidemic's characteristics differ between men and women.

Prospective associations between sedentary lifestyle and BMI in midlife:-
Objective:-
A strong positive cross-sectional relationship between BMI and a sedentary lifestyle has been consistently observed in numerous studies. However, it has been questioned whether high BMI is a determinant or a consequence of a sedentary lifestyle.

Research methods and Procedures:-
Using data from four follow-ups of the University of North Carolina Alumni Heart Study, we examined the prospective associations between BMI and sedentary lifestyle in a cohort of 4595 middle-aged men and women who had responded to questionnaires at the ages of 41 (standard deviation 2.3), 44 (2.3), 46 (2.0), and 54 (2.0).

Results:-
BMI was consistently related to increased risk of becoming sedentary in both men and women. The odds ratios of becoming sedentary as predicted by BMI were 1.04 (95% confidence limits, 1.00, 1.07) per 1 kg/m(2) from ages 41 to 44, 1.10 (1.07, 1.14) from ages 44 to 46, and 1.12 (1.08, 1.17) from ages 46 to 54. Controlling for concurrent changes in BMI marginally attenuated the effects. Sedentary lifestyle did not predict changes in BMI, except when concurrent changes in physical activity were taken into account ($p < 0.001$). The findings were not confounded by preceding changes in BMI or physical activity, age, smoking habits, or sex.

Discussion:-
Our findings suggest that a high BMI is a determinant of a sedentary lifestyle but did not provide unambiguous evidence for an effect of sedentary lifestyle on weight gain.

Sedentary Behaviors Increase Risk of Cardiovascular Disease Mortality in Men Purpose:-
To examine the relationship between two sedentary behaviors (riding in car
and watching television) and cardiovascular disease (CVD) mortality in men in the Aerobics Center Longitudinal Study.

Methods:-
Participants were 7,744 men (20-89 yr) initially free of CVD who returned a mail-back survey during 1982. Time spent watching TV and riding in a car were reported. Mortality data were ascertained through the National Death Index till Dec 31, 2003. Cox regression analysis quantified the association between sedentary behaviors (hr/wk watching television, hr/wk riding in car, total hr/wk in these two behaviors) and CVD mortality rates.

Results:-
377 CVD deaths occurred during 21 years of follow-up. After age-adjustment, time riding in a car and combined time spent in these two sedentary behaviors were positively (p trend <.001) associated with CVD death. Men who reported >10 hrs/wk riding in a car or >23 hr/wk of combined sedentary behavior had 82% and 64% greater risk of dying from CVD than those who reported <4 hr/wk or <11 hr/wk, respectively. The pattern of the association did not materially change after multivariate adjustment. Regardless of the amount of sedentary activity reported by these men, being older, normal weight, normotensive, and physically active was associated with a reduced risk of CVD death.

Conclusion:-
In men, riding in a car and combined time spent in these two sedentary behaviors were significant CVD mortality predictors. Additionally, high levels of physical activity were related to notably lower rates of CVD death even in the presence of high levels of sedentary behavior. Health promotion efforts targeting physically inactive men should emphasize both reducing sedentary activity and increasing regular physical activity for optimal cardiovascular health.

Impact of overweight on the risk of developing common chronic diseases during a 10-year period.
Background:-
Overweight adults are at an increased risk of developing numerous chronic diseases.

Methods:-
Ten-year follow-up (1986-1996) of middle-aged women in the Nurses' Health Study and men in the Health Professionals Follow-up Study to assess the health risks associated with overweight.

Results:-
The risk of developing diabetes, gallstones, hypertension, heart disease, and stroke increased with severity of overweight among both women and men. Compared with their same-sex peers with a body mass index (BMI) (calculated as weight in kilograms divided by the square

of height in meters) between 18.5 and 24.9, those with BMI of 35.0 or more were approximately 20 times more likely to develop diabetes (relative risk [RR], 17.0; 95% confidence interval [CI], 14.2-20.5 for women; RR, 23.4; 95% CI, 19.4-33.2 for men). Women who were overweight but not obese (ie, BMI between 25.0 and 29.9) were also significantly more likely than their leaner peers to develop gallstones (RR, 1.9), hypertension (RR, 1.7), high cholesterol level (RR, 1.1), and heart disease (RR, 1.4). The results were similar in men.

Conclusions:-
During 10 years of follow-up, the incidence of diabetes, gallstones, hypertension, heart disease, colon cancer, and stroke (men only) increased with degree of overweight in both men and women. Adults who were overweight but not obese (ie, $25.0 <$ or $=$ BMI $<$ or $= 29.9$) were at significantly increased risk of developing numerous health conditions. Moreover, the dose-response relationship between BMI and the risk of developing chronic diseases was evident even among adults in the upper half of the healthy weight range (ie, BMI of 22.0-24.9), suggesting that adults should try to maintain a BMI between 18.5 and 21.9 to minimize their risk of disease.

Prevalence of obesity among type 2 diabetic patients in al-khobar primary health care centers.
Objectives:-
This study estimated the prevalence of obesity among Type 2 diabetic patients who are followed in mini clinics (hypertension, diabetes) in Primary Health Care Centers (PHCC) in Al-Khobar.

Methods:-
Retrospective study reviewing all diabetic patient files registered in PHC centers in the Al- Khobar area from May 2000 to October 2001.

Results:-
Of the 382 diabetic patients followed in PHC, 88.7% were type 2 diabetics, and according to WHO classification of obesity, 0.7% were underweight. Only 21.8% of type 2 diabetic patients were in their ideal range of body weight. While 31.2% were overweight (BMI in the range of 25.0-29.9 kg/m2), 39.9% of the type 2 diabetic patients were found to be obese (BMI= 30 - 39.9 kg / m2), and 6.3% had morbid obesity (BMI > 40 kg / m2).

Conclusion:-
High prevalence of overweight and obesity in type 2 diabetics is associated with other serious complications. This study emphasizes the importance of training health care providers for the proper follow-up of patients.

Effect of overweight and obesity on glucose intolerance and dyslipidemia in Saudi Arabia, epidemiological study:-

Objective:-
The aim of this study was to study the effect of overweight and obesity on glucose intolerance and dyslipidemia in Saudi Arabia.

Methods:-
A cross-sectional national epidemiological randomized household survey of 2059 Saudi subjects, aged 30-64 years was carried out. The sample was representative and was in accordance with the national population distribution with respect to age, gender, regional and residency, urban versus rural population distribution. The subjects height and weight for the calculation of body mass index (BMI) was measured. Blood samples were drawn and assayed for glucose, total cholesterol, triglyceride and high density lipoprotein (HDL). Low-density lipoprotein (LDL) was calculated. The oral glucose tolerance test was carried out for subjects with borderline random glucose concentration and the overall prevalence of diabetes mellitus was calculated.

Results and conclusion:-
A high prevalence of obesity among the Saudi population was observed and mean serum glucose concentration was significantly higher among overweight and obese groups. The prevalence of diabetes mellitus was significantly higher among obese groups. The mean serum triglyceride concentration was only significantly higher among male obese groups. There was no significant difference in the mean of serum total cholesterol concentration between control and obese groups. Mean serum HDL concentration was lower among the obese group, however, the

difference was not significant. There was no significant difference in the prevalence of hypercholesterolemia between control and obese groups. Prevalence of hypertriglyceridemia was higher among obese groups and was significantly higher among male subjects across all BMI groups. Prevalence of hypo HDL cholesterolemia exceeded 50% of the study population. Obesity, glucose intolerance, hypertriglyceridemia, hypo HDL cholesterolemia and features of insulin resistance syndrome (IRS) are widely prevalent among the Saudi population over the age of 40 years. IRS is probable a significant contributor to the pathologic process of cardiovascular (CVD) disease among the Saudi population, especially in view of the low prevalence of hypercholesterolemia.

Material And Methods:-
We have analyzed the following 10 surveys that are suitable to our objectives:-
1st survey was a cross-sectional study (follow-up survey) on Norwegian boys and girls who age between 15 and 18 years old to study the association between Leisure time computer use and adolescent bone health

2nd survey was a small sample size, restricted geographic area, and little socio-cultural. The sample included 5,844 children (9-11 Year-Old) (45.6% boys, mean age = 10.4 years from study sites in Australia, Brazil, Canada, China, Colombia, Finland, India, Kenya, Portugal, South Africa, the United Kingdom, and the United States. This study aimed to investigate correlates of sedentary time and screen time in children around the world.

3rd survey was community-based national epidemiological health survey in Saudi Arabia on both gender and in rural as well as in urban communities conducted by examining Saudi subjects in the age group of 30-70 years of selected households over a 5-year period between 1995 and 2000 in KSA. Data were obtained from body mass index (BMI) and were analyzed to classify individuals with overweight (BMI = 25-29.9 kg/m2), obesity (BMI Ñ30 kg/m2) and severe (gross) obesity (BMI Ñ40 kg/m2) to provide the prevalence of overweight and obesity in KSA

4th survey was a study conducted on 1419 adult individuals (age > 14 years) suffering from type II diabetes mellitus (men = 711 and women = 708) and 13241 non-diabetic individuals (men = 5451 and women = 7790) to determine the prevalence of overweight and obesity using the Body Mass Index level.

5th survey was a multistage survey. Data was taken through interviewing 10,735 Saudis aged 15 years or older (51.1% women). Data on sociodemographic characteristics, health-related habits and behaviors, diet, physical activity, chronic diseases, access to and use of health care, and anthropometric measurements were collected through computer-assisted personal interviews.

6th survey was by Using data from four follow-ups of the University of North Carolina Alumni Heart Study, they examined the prospective associations between BMI and sedentary lifestyle in a cohort of 4595 middle-aged men and women who had responded to questionnaires at the ages of 41, 44, 46, and 54 years old.

7th survey Participants were 7,744 men (20-89 yr) initially free of cardiovascular disease who returned a mail-back survey during 1982. Time spent watching TV and riding in a car were reported. This study aimed To examine the relationship between two sedentary behaviors (riding in car and watching television) and cardiovascular disease mortality in men in the Aerobics Center Longitudinal Study.

8th survey method was ten-year follow-up (1986-1996) of middle-aged women in the Nurses' Health Study and men in the Health Professionals Follow-up Study to assess the health risks associated with overweight.

9th survey was a retrospective study reviewing all diabetic patient files registered in PHC centers in the Al-Khobar area from May 2000 to October 2001. This study aimed to estimate the prevalence of obesity among Type 2 diabetic patients who are followed in mini clinics (hypertension, diabetes) in Primary Health Care Centers (PHCC) in Al-Khobar.

10th survey was a cross-sectional national epidemiological randomized household survey of 2059 Saudi subjects, aged 30-64 years was carried out.

Background:-

Overweight and obesity prevalence has risen dramatically in recent decades. While it is known that overweight and obesity is associated with a wide range of chronic diseases, the cumulative burden of chronic disease in the population associated with overweight and obesity is not well quantified. The aims of this paper were to examine the associations between BMI and chronic disease prevalence; to calculate Population Attributable Fractions (PAFs) associated with overweight and obesity; and to estimate the impact of a one unit reduction in BMI on the population prevalence of chronic disease.

Patients whose weight falls into a higher category of body mass index (BMI) and obesity have an increased risk for multiple chronic diseases, according to a study published online October 16 in Family Practice. Younger people who are obese have similar chronic disease profiles as older, nonobese people.

Results:-

Many adolescents balanced 2-4 h screen time with moderate or high physical activity levels. Screen time was positively related to body mass index (BMI) in boys ($p=0.002$), who spent more time in front of the computer than girls did ($p<0.001$). In boys, screen time was adversely associated with bone mineral density at all sites, and these associations remained robust to adjustments for age, puberty, height, BMI, physical activity, vitamin D levels, smoking, alcohol, calcium and carbonated drink consumption ($p<0.05$). Screen time was also negatively associated with total hip bone mineral density ($p=0.031$). In contrast, girls who spent 4-6 h in front of the computer had higher BMD than the reference (<2 h). Children averaged 8.6 hours of daily sedentary time, and 54.2% of children failed to meet screen time guidelines. In all study sites, boys reported higher screen time, were less likely to meet screen time guidelines, and had higher BMI z-scores than girls. In 9 of 12 sites, girls engaged in significantly more sedentary time than boys. Common correlates of higher sedentary time and screen time included poor weight status, not meeting physical activity guidelines, and having a TV or a computer in the bedroom.

Data were obtained by examining 17,232 Saudi subjects from selected households who participated in the study. The prevalence of overweight was 36.9%. Overweight is significantly more prevalent in males (42.4%) compared to 31.8% of females ($p<0.0001$). The age-adjusted prevalence of obesity was 35.5% in KSA with an overall prevalence of 35.6% [95% CI: 34.9-36.3], while severe (gross) obesity was 3.2%. Females are significantly more obese with a prevalence of 44% than males 26.4% ($p<0.0001$).

In the total population, the prevalence of Type II diabetes mellitus was 9.7% and 7.1%, obesity was 13.1% and 20.3% and overweight was 27.2% and 25.2% in the total men and women. When the Type II diabetes mellitus population was separated from the non-diabetics, the prevalence of obesity was 39.3% among diabetic women compared to 18.5% among non-diabetic women ($p < 0.0001$). The prevalence of obesity was lower among men compared to the women, and diabetic men had higher prevalence than non-diabetic males (20.7% and 12.1%, respectively) ($p < 0.001$). On the other hand, overweight men (37%) were more prevalent than the women (29.7%) in the diabetic group and the men and women in the non-diabetic group 25.9% and 24.8%, respectively ($p < 0.001$). The population was stratified on the basis of the different provinces to which they belonged and the prevalence of both obesity and overweight showed significant differences in the different provinces where the highest prevalence of obesity was in the diabetic females in the Eastern province, while the lowest prevalence was in the South-western province. (Look at figure 1 and 2)
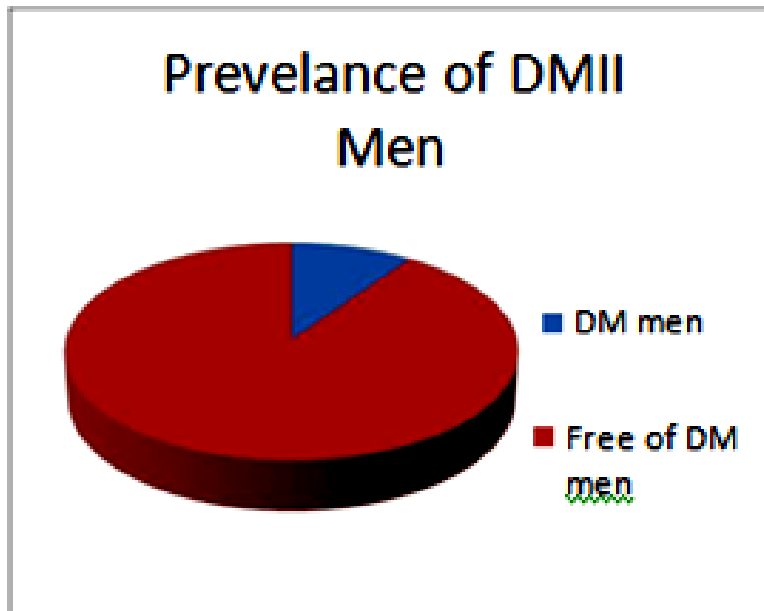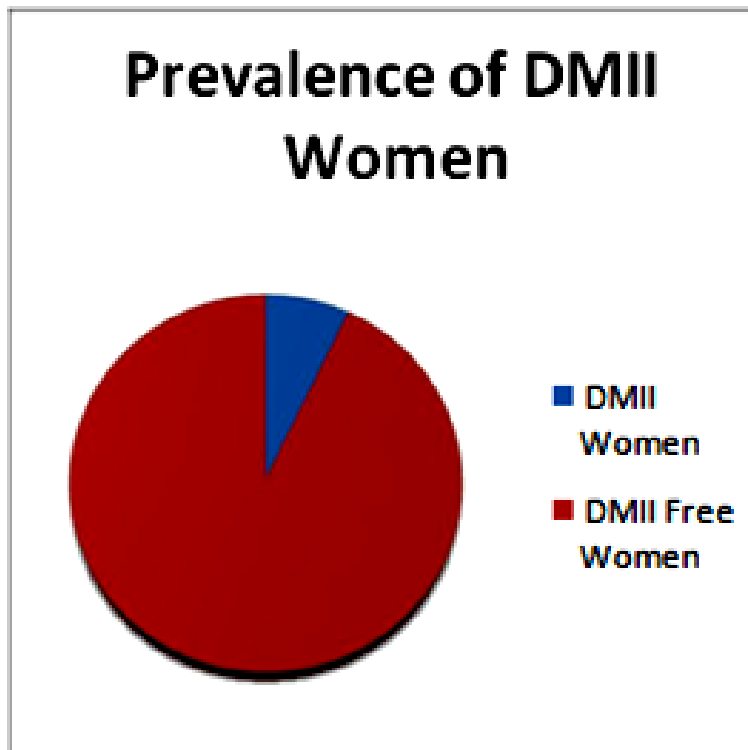
Figure 1:- (Original)

Figure 2:- (Original)

Of the 10,735 participants evaluated, 28.7% were obese (body mass index ≥30 kg/m2). Prevalence of obesity was higher among women (33.5% vs 24.1%). Among men, obesity was associated with marital status, diet, physical activity, diagnoses of diabetes and hypercholesterolemia, and hypertension. Among women, obesity was associated with marital status, education, history of chronic conditions, and hypertension

BMI was consistently related to increased risk of becoming sedentary in both men and women. The odds ratios of becoming sedentary as predicted by BMI were 1.04 (95% confidence limits, 1.00, 1.07) per 1 kg/m(2) from ages 41 to 44, 1.10 (1.07, 1.14) from ages 44 to 46, and 1.12 (1.08, 1.17) from ages 46 to 54. Controlling for concurrent changes in BMI marginally attenuated the effects. Sedentary lifestyle did not predict changes in BMI, except when concurrent changes in physical activity were taken into account (p < 0.001). The findings were not confounded by preceding changes in BMI or physical activity, age, smoking habits, or sex.

377 CVD deaths occurred during 21 years of follow-up. After age-adjustment, time riding in a car and combined time spent in these two sedentary behaviors were positively (p trend <.001) associated with CVD death. Men who reported >10 hrs/wk riding in a car or >23 hr/wk of combined sedentary behavior had 82% and 64% greater risk of dying from CVD than those who reported <4 hr/wk or <11 hr/wk, respectively. The pattern of the association did not materially change after multivariate adjustment. Regardless of the amount of sedentary activity reported by these men, being older, normal weight, normotensive, and physically active was associated with a reduced risk of CVD death.

The risk of developing diabetes, gallstones, hypertension, heart disease, and stroke increased with severity of overweight among both women and men. Compared with their same-sex peers with a body mass index (BMI) (calculated as weight in kilograms divided by the square of height in meters) between 18.5 and 24.9, those with BMI of 35.0 or more were approximately 20 times more likely to develop diabetes (relative risk [RR], 17.0; 95% confidence interval [CI], 14.2-20.5 for women; RR, 23.4; 95% CI, 19.4-33.2 for men). Women who were overweight but not obese (ie, BMI between 25.0 and 29.9) were also significantly more likely than their leaner peers to develop gallstones (RR,1.9), hypertension (RR, 1.7), high cholesterol level (RR, 1.1), and heart disease (RR, 1.4). The results were similar in men.

Of the 382 diabetic patients followed in PHC, 88.7% were type 2 diabetics, and according to WHO classification of obesity, 0.7% were underweight. Only 21.8% of type 2 diabetic patients were in their ideal range of body weight. While 31.2% were overweight (BMI in the range of 25.0-29.9 kg/m2), 39.9% of the type 2 diabetic patients were found to be obese (BMI= 30 - 39.9 kg / m2), and 6.3% had morbid obesity (BMI > 40 kg / m2).

A high prevalence of obesity among the Saudi population was observed and mean serum glucose concentration was significantly higher among overweight and bese groups. The prevalence of diabetes mellitus was significantly higher among obese groups. The mean serum triglyceride concentration was only significantly higher among male obese groups. There was no significant difference in the mean of serum total cholesterol concentration between control and obese groups. Mean serum HDL concentration was lower among the obese group, however, the difference was not significant. There was no significant difference in the prevalence of hypercholesterolemia between control and obese groups. Prevalence of hypertriglyceridemia was higher among obese groups and was significantly higher among male subjects across all BMI groups. Prevalence of hypo HDL cholesterolemia exceeded 50% of the study population. Obesity, glucose intolerance, hypertriglyceridemia, hypo HDL cholesterolemia and features of insulin resistance syndrome (IRS) are widely prevalent among the Saudi population over the age of 40 years. IRS is probable a significant contributor to the pathologic process of cardiovascular (CVD) disease among the Saudi population, especially in view of the low prevalence of hypercholesterolemia

Conclusion:-
In Norwegian boys, time spent on screen-based sedentary activity was negatively associated with bone mineral density levels; this relationship persisted 2 years later. Such negative associations were not present among girls.

Many common correlates of sedentary time and screen time were identified, some of which are easily modifiable (e.g., removing TV from the bedroom), and others that may require more intense behavioral interventions (e.g., increasing physical activity).

Obesity and overweight are increasing in KSA with an overall obesity prevalence of 35.5%. Reduction in overweight and obesity are of considerable importance to public health.

Obesity may be considered as a major etiological factor in development of Type II diabetes mellitus in Saudis.

Obesity remains strongly associated with diabetes, hypercholesterolemia, and hypertension in the KSA, although the epidemic's characteristics differ between men and women.

High BMI is a determinant of a sedentary lifestyle but did not provide unambiguous evidence for an effect of sedentary lifestyle on weight gain.

In men, riding in a car and combined time spent in these two sedentary behaviors were significant CVD mortality predictors. Additionally, high levels of physical activity were related to notably lower rates of CVD death even in the presence of high levels of sedentary behavior.

During 10 years of follow-up, the incidence of diabetes, gallstones, hypertension, heart disease, colon cancer, and stroke (men only) increased with degree of overweight in both men and women. Adults who were overweight but not obese (ie, $25.0 <$ or $= BMI <$ or $= 29.9$) were at significantly increased risk of developing numerous health conditions. Moreover, the dose-response relationship between BMI and the risk of developing chronic diseases was evident even among adults in the upper half of the healthy weight range (ie, BMI of 22.0-24.9), suggesting that adults should try to maintain a BMI between 18.5 and 21.9 to minimize their risk of disease.

High prevalence of overweight and obesity in type 2 diabetics is associated with other serious complications.

A high prevalence of obesity among the Saudi population was observed and mean serum glucose concentration was significantly higher among overweight and obese groups. The prevalence of diabetes mellitus was significantly higher among obese groups. The mean serum triglyceride concentration was only significantly higher among male obese groups. There was no significant difference in the mean of serum total cholesterol concentration between control and obese groups. Mean serum HDL concentration was lower among the obese group, however, the difference was not significant. There was no significant difference in the prevalence of hypercholesterolemia between control and obese groups. Prevalence of hypertriglyceridemia was higher among obese groups and was significantly higher among male subjects across all BMI groups. Prevalence of hypo HDL cholesterolemia exceeded 50% of the study population. Obesity, glucose intolerance, hypertriglyceridemia, hypo HDL cholesterolemia and features of insulin resistance syndrome (IRS) are widely prevalent among the Saudi population over the age of 40 years. IRS is probable a significant contributor to the pathologic process of cardiovascular (CVD) disease among the Saudi population, especially in view of the low prevalence of hypercholesterolemia.

Recommendations:-
We recommend that:
1) Encourage active life and exercise
2) Induce people to be in a healthy weight
3) Educate people more about healthy food

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