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Awareness Regarding Risk Factors Of Overweight And Obestiy Among Type II Diabetic Patients Attending In The Primary Health Care At Saudi Arabia 2023

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Abstract:

***Background**:*
Diabetes mellitus and obesity are key risk factors for long-term complications associated with type 2 diabetes mellitus. Previous studies have shown that the prevalence of diabetes mellitus and obesity is high in the KSA. However, none of these studies has focused on the investigation of diabetes mellitus and obesity in Makkah patients with type 2 diabetes mellitus. Obesity and diabetes mellitus are known to contribute directly or indirectly to the development of long-term complications of type 2 diabetes mellitus. Obesity is a serious public health concern all over the world. In KSA obesity is on rise and if proper intervention and preventive strategies were not ado[1]pted of obesity will prove fatal. Obesity among type 2 diabetic patients has proven to have adverse effects in management and control of diabetes and a considerable proportion of type 2 diabetic patients have been reported to be obese in different settings, which increase the risk of complications among them. ***Aim of the study**: To assesment the Awareness regarding risk factors of overweight and obestiy among type II diabetic patients attending in the primary health care in Makah Al-Mukarramah at Saudi Arabia2023.* ***Method:** A cross-sectional study was conducted at AL-Eskan PHC, among type II diabetic patients and obesity attending in the AL-Eskan PHC Makkah among a random sample of type 2 diabetic and obesity patients registered in the chronic disease clinic. Our total sample size will be 200 patients.* ***Results:** the majority of our participants were have increase BMI (obese) were constitutes (59.0 %), while normal BMI participants were constitute (40.0 %). the majority of our study are male's gender in our study was (59.0%). the majority nationality Saudi was (87.0%)* ***Conclusion**: The high prevalence of overweight and obesity among patients with type 2 diabetes is a significant public health concern that transcends geographical boundaries within Saudi Arabia . The findings from this review highlight the need for innovative weight management interventions that are tailored to the cultural context of the Saudi Arabia setting. Future*

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analysis might examine prospectively whether or not increase in physical activity in unhealthy weighty adults will cause a healthier standing.

Keywords: *Awerness , Obesity, Type 2 diabetes mellitus, Risk Factors, PHC.*

1. Introduction

Obesity is regarded as one of the most common health issue in different parts of the world. In Saudi Arabia, there is an increasing trend in the prevalence of obesity and overweight, which are also the sources of various diseases including hypertension, diabetes, obstructive sleep apnea, CVD etc. the rate of obesity is significantly high in the country, and expected to increase in future. There is a dire need to raise the issue at the national level, and design efforts and strategies to combat obesity in the country, through involvement of all stakeholders, including policy makers, educators, healthcare providers, and individual citizens. [1]

Obesity is strongly linked to insulin resistance, which, when associated with relative insulin deficiency, leads to the development of type 2diabetes mellitus [2].

The prevalence of overweight and fat has enhanced dramatically throughout last 3 decades with devastating consequences to public health, the rise in fat epidemic is happening against the Background of continuous decline within the energy expenditure needed for daily living. Overweight and fat are outlined as abnormal or excessive fat accumulation that will impair health for adults overweight could be a BMI bigger than or capable 25; and obesity is a BMI greater than or equal to 30 [3]. The prevalence of obesity, over the past 3 decades, has increased in many countries around the world. It is defined by a 30 or higher body mass index (BMI)[4]

Type 2 diabetes, obesity and hyperlipidaemia have been traditionally considered as diseases of affluence. A wealth of data indicates that Asian Indian people abdominal obesity and insulin resistance , and develop glucose intolerance more often.[5] In the context, Saudi Arabia is now among the nations with the highest obesity and overweight the prevalence of obesity in Saudi Arabia on the basis of the findings of previous literature.[6]

Because of its high prevalence and the associated medical and psychosocial risks, research into the causes of obesity has experienced a tremendous upswing. Formal genetic data based on twin, adoption, and family studies lead to the conclusion that at least 50% of the inter individual variance of the body mass index (BMI; defined as weight in kilograms divided by height in meters squared) is due to genetic factors. As a result of the recent advent of genome-wide association studies, the first polygenes involved in body weight regulation have been detected. The rapid growth in the rate of obesity is directly contributed by environmental and behavioural factors, rather than the biological factors. Moreover, racial or ethnic differences, consumption pattern, and lifestyle also influence the rate of obesity. For instance, as compared to rural areas, people in urban areas have higher obesity rate, possibly due to consumption of high-fat diets and more sedentary lifestyles. For daily living, the amount of energy spent has also reduced over the years, which also promotes obesity. Obesity is also often associated with high socio-economic status; as populations in the developed world are mostly affected by obesity.[7] Obesity defined as an excess accumulation of adipose tissue due to inappropriate energy intake and energy output.[8] over the past few decades, Saudi Arabia has become more and more westernized, and currently it's one amongst the very best obesity and overweight prevalence rates. The speed of obesity is considerably high within the country among completely different age teams and occupations; at different locations in the country; and among each males and females. the most factors inflicting blubber embody case history, diet pattern and uptake habits, genetic factors, legal status, high blood pressure and lack of physical activities; whereas, the main consequences are vessel diseases, diabetes, cancers, and ischaemic cardiopathy.

The analysis stresses on the necessity to boost awareness concerning obesity and style efforts and methods to combat it within the country .[9]

1.2. Literature Review

C Daousi et al.(2006) published their study in the Postgraduate medical journal. Which was determining the prevalence of overweight and obesity among patients with type 1 and type 2 diabetes mellitus attending a secondary care diabetes clinic in the United Kingdom, and assessing the impact of overweight and obesity on glycemic control and cardiovascular risk factors in patients with type 2 diabetes. They concluded, out of 916 patients with type 1 diabetes, 55.3% were overweight (BMI >25 kg/m2), 16.6% were obese (BMI >30 kg/m2), and 0.4% had morbid obesity (BMI >40 kg/m2). In contrast, out of 2721 patients with type 2 diabetes a 52% were obese, and 8.1% had morbid obesity.[10]

Alzaman et al (2016) reported in their comprehensive review that over the last two decades, obesity was a risk factors for increasing incidence of type 2 diabetes mellitus among Arabs. They explained that to the fact that obesity is strongly associated with insulin resistance, which, if associated with insulin deficiency, leads to overt type 2 diabetes mellitus [8] .

In Al-Khobar region, AlMugharbel et al. (2003) reviewed 382 files of type 2 diabetic patients in PHC centers to estimate the prevalence of obesity among Type 2 diabetic patients. Their results revealed that 39.9% were obese and 6.3% had morbid obesity [11].

In Jeddah (2013), Bakhotmah identified the risk factors for developing obesity among 723 Saudi diabetic patients attending PHC centers. The prevalence of obesity was 38.3% among them, 15.9% had severe obesity. Prevalence of severe obesity was more significantly reported among female than male diabetic patients. The housewives were at higher risk for obesity; particularly non-smokers [12].

In Yemen, Al-sharafi et al (2014) estimated the prevalence of obesity in patients 25 years old/above with type 2 diabetes mellitus. The prevalence of obesity among male patients (BMI ≥ 30 kg/m2) was 11% whereas it was 32% among female patients [13] .

Abuyassin et al (2015) published a review regarding the association between obesity and type 2 diabetes in the Arab world and concluded that the Arab world have an epidemic of obesity and type 2 diabetes mellitus. They reported that replication studies have identified several genetic variants in Arab people with obesity linked diabetes [14] .

2. Rationale.

Obesity is also no longer a condition that just affects older people, although the likelihood does increase with age, and increasing numbers of young people have been diagnosed with obesity. the prevalence of obesity is increasing; therefore, this issue implicated to complicate the diabetes outcome, according to health experts, such a rise would result in more than a million extra cases of type 2 diabetes, heart disease and cancer the researcher has a special interest in obesity and its related complication. Over the next 20 years, the number of obese adults in the country is forecast to soar to 26 million people.

2.1 Aim of the study:

To assesment the Awareness regarding risk factors of overweight and obestiy among type II diabetic patients attending in the primary health care in Makah Al-Mukarramah at Saudi Arabia2023.

2.2 Objectives:

To assesment the Awareness regarding risk factors of overweight and obestiy among type II diabetic patients attending in the primary health care in Makah Al-Mukarramah at Saudi Arabia2023.

3. Methodology:

3.1 Study Design:

A cross-sectional study, design was used in carrying out of this study.

3.2 Setting :

The study will be carried out in the city of Makah Al-Mokarramah Makah is the holiest spot on Earth. It is the birthplace of the Prophet Mohammad and the principal place of the pilgrims to perform Umrah and Hajj. It is located in the western area in Kingdom of Saudi Arabia and called the Holy Capital. Contains a population around 1.578 million. This study was conducted in Makah primary health–care centers at saudi Arabia, and it reflects a diversified demographic profile with a considerable portion of the population comes from rural descent, while others come from an urban one. This difference translates into biological, socioeconomic and lifestyle differences in the Makah population, The current study was conducted Primary Health Care Center in Makah, providing all primary health care services including chronic disease clinic

3.3 Study Sampling :

Sample size will be 200 patients. Systematic sampling technique has be used. During the last 4 weeks the total number of diabetic patients who visited the chronic disease clinic at AL-Eskan PHC was 500 patients.

Dependent on 50% prevalence, 95% confidence level, 5%error and 10% f or defaulter and non-respondent by using Raosoft website for sample size calculation the sample size has be 200 patients. Sample Size Calculator by Raosoft

3.4 Study population:

All type 2 Diabetic Patients who registered in chronic disease clinic in AL-Eskan PHC Primary Health Care Center**.**

3.5 Inclusion criteria

- All type II diabetic patients.
- Both males and females.
- All nationalities.

3.6 Sampling technique

Systematic sampling technique has be used. initially by listing all the participant and giving each name a code number and then every other participant has be chosen.

4. Data collection tool

- Self-administrated questionnaire will be used for data collection. It has be adopted and modified from the previous study and has be validated by two to three consultants. AL-Eskan PHC it consists of two section:
  First section: socio-demographic and personal characteristics. Second section: associated factors including smoking, physical exercise, diet habit. As well as the body mass index (BMI) which has be calculated **BY AN EXPERT NURSE.**

5. Data Collection technique

- During the study period (14th January to 1st February) which correspond to three weeks, the researcher has be available five days in the week and throughout the work time of the primary health care center.
- The researcher has be sitting in the waiting area of the primary health care centre to distribute the questionnaire by herself to the selected patient.
- The researcher has be available to clarify any issue, and the questionnaire has be collected at the same time.

6. Data entry and analysis

Data has be entered using the Statistical Product and service solution (SPPS version 21). Necessary statistical tests (such as Chi-square, T-test and other appropriate tests) has be used with a significance of p-value at < 0.05.

7. Pilot study/pretesting

A pilot study has be conducted on 10% of sample size, which are approximately 16patient in another PHC rather than which involved in the study to test the validity of the questionnaire. The modification has be made according to the pilot results**.**

8. Ethical Consideration .

- Research committee approval.
- Written permission from the joint program of family medicine in Makkah Al-Mukarramah.
- Written permission from concerned authority in Ministry of Health (MOH) PHCC in Makkah Al-Mukarramah.
- Individual verbal consent from all participants before data collection.
- Acknowledgments of all supervisors, advisors, helpers, facilitators and participants. Relevance & expectations
- All collected data will be kept confidential.

10. Budget .

Self-funded

Results

Table (1) Distribution of the demographic characteristics of about the participants of the study attending in the primary health care center (n=200)

	N	**%**
Sex		
Male	118	59
Female	82	41
Nationality		
Saudi	174	87
Non-Saudi	26	13
Age		
<50years	70	35
50-60yaers	88	44
More than or equal 60years	42	21
Range	38-75	
Mean±SD	52.45±12.84	
Marital status		
Non married	30	15
Married	170	85
Income level		
<5000	80	40
5000-10000	44	22
10000-15000	52	26
>15000	24	12
Educational level		
Illiterate	38	19
Primary school	42	21

Intermediate school	32	16
Secondary school	36	18
College/University	40	20
Postgraduate degree	12	6
Smoking		
Smoker	70	35
Non-smoker	130	65

Table (1) show gender the majority of our study are male's gender in our study was (59.0%) while Female were (41.0%) of cases. Nationality in our study the majority nationality Saudi was (87.0%) while Non-Saudi (13.0%). Age in our study, age period of (50-60)years (44.0%) constitutes the most common period in our study, while the age period of (<50)years represents (35.0%). Marital status in our study the majority of participant is married (85.0%) while the non-married were (15.0 %). Economic level in our study, Economic level Below 5000 SR percentage of participants was (40.0%). While from 10000- 15000SR level were (26.0%) of participants . Education Level the majority of our participants were at Primary school were constitutes (21.0%), followed by College/University were constitutes (20.0%) Smoking the majority of our participants were non-smoker were constitutes (65.0%), followed by smoker were constitutes (35.0%)

Table (2) Distribution of the associate factors to obesity of the participants of the study .

	N	%
Physical activities or exercises		
No	150	75
Yes	50	25
Type of physical activities or exercises (n=50)		
Walking	13	26
Running	6	12
Both	31	62
Do you stop aerobic exercise for two consecutive days or more per week?		
Always	108	54
Sometimes	62	31
No	30	15
Eating a portion of fruit		
Never	20	10
Daily	84	42
Weekly	78	39
Monthly	18	9
Eating a portion of vegetables		
Never	20	10
Daily	112	56
Weekly	68	34
Do you have breakfast daily?		

Always	132	66
Sometimes	46	23
No	22	11
Do you drink soft drink daily? E.g. Pepsi		
Always	32	16
Sometimes	38	19
No	130	65
Please indicate below which chronic condition(s) you have		
Asthma	14	7
High blood pressure	66	33
High fat and cholesterol	52	26
Emphysema or COPD	4	2
Other lung diseases Type of lung disease	10	5
Heart diseases	22	11
Arthritis or other rheumatic diseases	32	16

Table 2 show Physical activities or exercises the majority of our participants were do not physical activities or exercise constitutes (75.0 %), followed by yes to physical activities or exercise participants were constitute (25.0 %). Type of physical activities or exercises the majority of our participants were both (walking and running physical activities constitutes (62.0 %). Followed by walking physical, regarding the Do you stop aerobic exercise for two consecutive days or more per week in our participants were always stop aerobic exercise for two consecutive days or more per week constitutes (54.0%) , followed by sometimes stop aerobic exercise for two consecutive days or more per week constitutes (31.0%), eating a portion of fruit the majority of our participants were eating a portion of fruit daily constitutes (42.0 %), followed by eating a portion of fruit weekly participants were constitute (39.0%) , never eating a portion of fruit constitute (10.0 %), eating a portion of vegetables the majority of our participants were eating daily a portion of vegetables constitutes (56.0 %), followed by Eating weekly a portion of vegetables participants were constitute (34.0 %), do you have breakfast daily the majority of our participants were have always breakfast daily were constitutes (66.0 %). Followed by Sometimes have breakfast participants were constitute (23.0 %), do you drink soft drink daily? E.g. Pepsi the majority of our participants were have no drink soft drink daily or Pepsi were constitutes (65.0 %), followed by sometimes drink soft drink daily or Pepsi participants were constitutes (19.0 %).

Table (3) Distribution the BMI of the obesity in the participants of the study

BMI		
	N	**%**
Normal	82	41
Obese	118	59
Total	200	100

Table 3 show the majority of our participants were have increase BMI (obese) were constitutes (59.0 %), while normal BMI participants were constitute (40.0 %).

Figure **(1)** Distribution the BMI of the obesity in the participants of the study

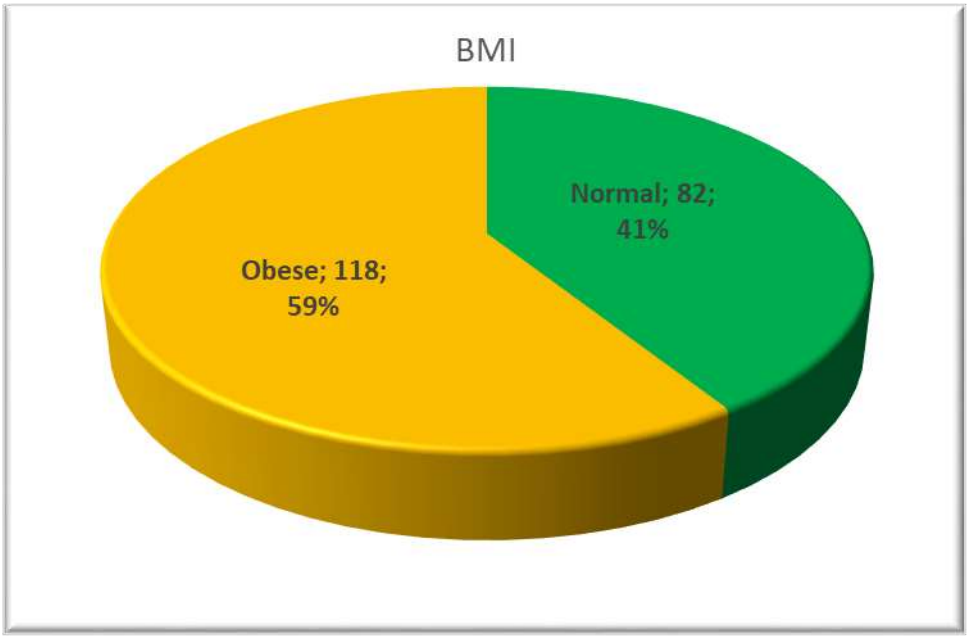


Table (4) Distribution the relation of normal, obese and demographic data of participants.

		Normal		Obese		Total		Chi-square	
		N	%	N	%	N	%	X^2	P-value
Sex	**Male**	45	54.88	73	61.86	118	59	0.976	0.323
	Female	37	45.12	45	38.14	82	41		
Nationality	**Saudi**	78	95.12	96	81.36	174	87	8.106	0.004
	Non-Saudi	4	4.88	22	18.64	26	13		
Age	**<50years**	35	42.68	35	29.66	70	35	17.615	0.000
	50-60yaers	22	26.83	66	55.93	88	44		
	More than or equal 60years	25	30.49	17	14.41	42	21		
Marital status	**Non married**	25	30.49	5	4.24	30	15	26.148	0.000
	Married	57	69.51	113	95.76	170	85		
Income level	**<5000**	30	36.59	50	42.37	80	40	66.488	0.000
	5000-10000	40	48.78	4	3.39	44	22		
	10000-15000	10	12.20	42	35.59	52	26		
	>15000	2	2.44	22	18.64	24	12		
Educational level	**Illiterate**	10	12.20	28	23.73	38	19	10.522	0.062
	Primary school	18	21.95	24	20.34	42	21		
	Intermediate school	20	24.39	12	10.17	32	16		
	Secondary school	13	15.85	23	19.49	36	18		
	College/University	15	18.29	25	21.19	40	20		
	Postgraduate degree	6	7.32	6	5.08	12	6		
Smoking	**Smoker**	65	79.27	5	4.24	70	35	119.720	0.000

	Non-smoker	17	20.73	113	95.76	130	65		

Table 4 show that is a significant difference between normal, obese and demographic data of participants in the nationality, age , marital status, income level, level of education, smoking, where respectively were $\mathbf{X^2}$(8.106, 17.615, 26.148, 66.488, 10.522, 10.522)and respectively p-value = 0.004,0.000, 0.000, 0.000,0.026, 0.000)

Figure (2) Distribution the relation of normal, obese and demographic data of participants

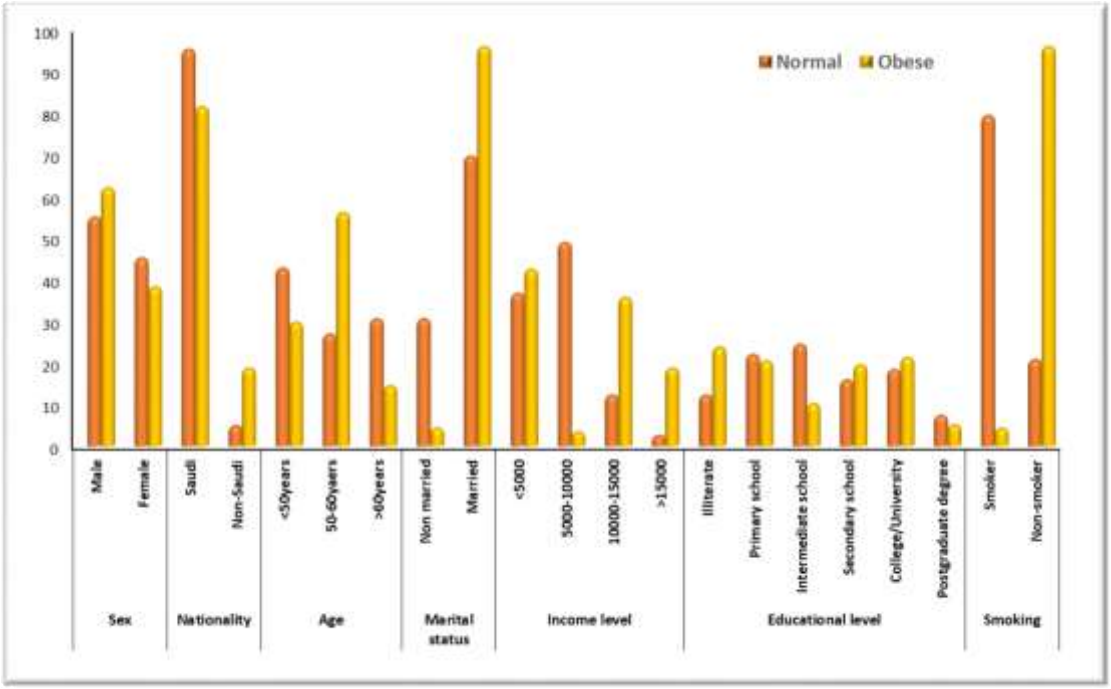


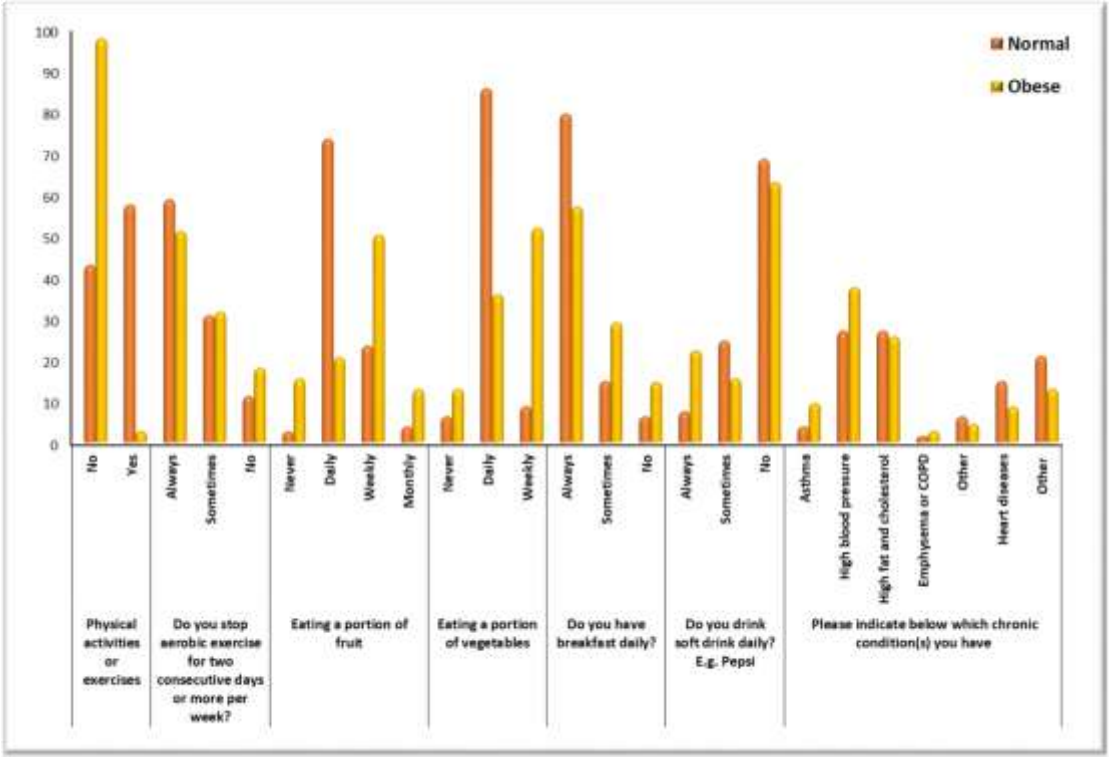
Table (5) Distribution the relation of normal, obese and variable data of participants.

		Normal		**Obese**		**Total**		**Chi-square**	
		N	**%**	**N**	**%**	**N**	**%**	**X^2**	**P-value**
Physical activities or exercises	**No**	35	42.68	115	97.46	150	75	77.415	0.000
	Yes	47	57.32	3	2.54	50	25		
Do you stop aerobic exercise for two consecutive days or more per week?	**Always**	48	58.54	60	50.85	108	54	2.042	0.360
	Sometimes	25	30.49	37	31.36	62	31		
	No	9	10.98	21	17.80	30	15		
Eating a portion of fruit	**Never**	2	2.44	18	15.25	20	10	52.978	0.000
	Daily	60	73.17	24	20.34	84	42		
	Weekly	19	23.17	59	50.00	78	39		
	Monthly	3	3.66	15	12.71	18	9		
Eating a portion of vegetables	**Never**	5	6.10	15	12.71	20	10	52.978	0.000
	Daily	70	85.37	42	35.59	112	56		
	Weekly	7	8.54	61	51.69	68	34		
Do you have breakfast daily?	**Always**	65	79.27	67	56.78	132	66	10.973	0.004
	Sometimes	12	14.63	34	28.81	46	23		
	No	5	6.10	17	14.41	22	11		
	Always	6	7.32	26	22.03	32	16	8.906	0.012

Do you drink soft drink daily? E.g. Pepsi	**Sometimes**	20	24.39	18	15.25	38	19		
	No	56	68.29	74	62.71	130	65		
Please indicate below which chronic condition(s) you have	**Asthma**	3	3.66	11	9.32	14	7	8.229	0.222
	High blood pressure	22	26.83	44	37.29	66	33		
	High fat and cholesterol	22	26.83	30	25.42	52	26		
	Emphysema or COPD	1	1.22	3	2.54	4	2		
	Other lung diseases Type of lung disease	5	6.10	5	4.24	10	5		
	Heart diseases	12	14.63	10	8.47	22	11		
	Arthritis or other rheumatic diseases	17	20.73	15	12.71	32	16		

Table 4 show that is a significant difference between normal, obese and demographic data of participants in the nationality, age , marital status, income level, level of education, smoking, where respectively were $\mathbf{X^2}$(8.106, 17.615, 26.148, 66.488, 10.522, 10.522)and respectively p-value = 0.004,0.000, 0.000, 0.000,0.026, 0.000)
Regarding the physical activities or exercises, eating a portion of fruit, eating a portion of vegetables, do you have breakfast daily, do you drink soft drink daily? e.g. Pepsi, show that is a significant difference between normal, obese and different variable data of participants where respectively were $\mathbf{X^2}$(77.415, 52.978, 52.978)

Figure (3) Distribution the relation of normal, obese and variable data of participants



6. Discussion

There is unequivocal evidence that determination of the prevalence of type 2 diabetes mellitus risk factors such as obesity in KSA population is a very essential measure for creating and program type 2 diabetes mellitus specialized care and management plans, the present our study to assessment prevalence and associated risk factors of obesity among type II diabetic patients attending in the primary health care center in the in Makah Al-Mukarramah 2023. Obesity defined as an excess accumulation of adipose tissue due to inappropriate energy intake and energy output. The physical activity higher among metabolically healthy obese patent among their unhealthy obese counterparts, and these differences were evident only when measured objectively. This study was conducted in the Holy Capital of Makah is the religious capital of Saudi Arabia where millions of Muslims face it during their daily prayers. And each year the Holy City of Makah is host to some two million hajjis (pilgrims) from all over the world. The Holy City of Makah [15] .

In the current study, show the majority of our participants were have increase BMI (obese) were constitutes (59.0 %), while normal BMI participants were constitute (40.0 %).(See table 3)

This figure is higher than those reported in other similar studies carried out either locally or internationally. In Aseer region [16] . In Al-Khobar region [8] . In Jeddah [12]. In Yemen [16]. In Tanzania [17] . In the United Kingdom [10] . The high prevalence of obesity among type 2 diabetic patients is explained by the fact that obesity is strongly associated with insulin resistance, which, if associated with insulin deficiency, leads to overt type 2 diabetes mellitus [18].

In the present study, there show that is a significant difference between normal, obese and demographic data of participants in the nationality, age , marital status, income level, level of education, smoking, where respectively were X2(8.106, 17.615, 26.148, 66.488, 10.522, 10.522)and respectively p-value = 0.004,0.000, 0.000, 0.000,0.026, 0.000)

No significant difference between male and female type 2 diabetic patients regarding prevalence of obesity. In another study carried out in Jeddah [19], prevalence of obesity was higher in male than female patients. Also in Yemen, the prevalence of obesity among male patients was 11% whereas it was 32% among female patients [20]. In Tanzania, female diabetic patients were at almost 5-folds higher risk of overweight/obesity compared to male patients [17].

Marital status was a significant predictor for obesity among type 2 diabetic patients in the current study as divorced patients were at higher risk for obesity compared to singles. [21]

Lack of physical activity was associated with higher rate of obesity in this study as participants who didn`t stop aerobic exercise for two consecutive days or more per week were at lower risk for obesity compared to those did that always. This is confirmed in many other studies [22,23,24]

In this study, poor dietary habit manifested by never eating fruits was associated with obesity in bivariate analysis. However, after controlling for confounders in multivariate analysis, this effect disappeared. In another Saudi study, obesity was associated with physical inactivity and unhealthy dietary habits [21,24]. Lifestyle intervention approaches including physical activity and dietary habits have proven to be effective in controlled trials in reducing burden of both obesity and type 2 diabetes [25]

Insulin therapy is usually given to type 2 diabetic patients with poor glycemic control. In a study carried out in Aseer region, poor diabetic control significantly association with obesity [26], in table (5) Show that no significant difference in the items (Asthma, High blood pressure, High blood pressure , Arthritis or other rheumatic diseases) Where Chi-square (8.229) where the p-value 0.222.

Conclusion

The prevalence of overweight and obesity in the KSA is significantly high among all age . Older age, male sex, lack of dairy consumption and elevated parental BMI, but not self-reported exercise or family income, are independent determinants of among type II diabetic

patients obesity in this population. Moreover, higher BMI is associated with a higher BP, indicative of the adverse effects of among type II diabetic patients obesity. Prevention strategies should focus on among type II diabetic patients, particularly those with a parental history of obesity, and should encourage the consumption of dairy foods. Longitudinal studies to investigate the trends and the impact of among type II diabetic patients obesity on the prevalence of non-communicable diseases in the KSA .

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