

Assessment Prevalence of the Obesity and Effectuated in Type 2 Diabetes and Obesity-Related Risk Factors on Patients Attending in Primary Health Care Center in Makkah Al-Mokarramah 2021

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ABSTRACT

Background

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 microvascular complications among them. Overweight and obesity constitute a global pandemic with devastating consequences that affect >2 billion people. Obesity plays a central role in morbidity and mortality of diseases of multiple organs and systems, and it is a major

contributor to the growing incidence of type 2 diabetes . It is well demonstrated that physical activity is an effective non-pharmacological intervention to improve diabetes control and should be an integral component of the care strategy of diabetic patients. There is now sufficient level of evidence for the association between overweight and type 2 diabetes , among which are the most common type 2 diabetes worldwide. Conditions related to obesity are increasingly common, such as metabolic syndrome, impaired fasting glucose (IFG) and impaired glucose tolerance (IGT), all of which indicate high risk for type 2 diabetes (T2DM).The study aimed: To assessment prevalence of the obesity and effected in type 2 diabetes and obesity-related risk factors on patients attending in primary health care center in makkah al-mokarramah.Method: cross-sectional study was conducted among patients with type 2 diabetes and obesity who registered in the chronic disease clinic attended PHC in Makkah at Saudi Arabia in 2021. Our total participants were (200). Results show what type of treatment do you use for diabetes most of participant tablets with insulin were (54.0%), complications from diabetes most of participants answer No (58.0%), regarding have any complication, please select it most of participant Complication on eyewere(34.52%) follow by Cardiovascular complication were (22.62%).

Conclusion: Obesity is highly prevalent among type 2 diabetic patients. Some modifiable risk factors were identified. Multidisciplinary effort is warranted to reduce obesity among type 2 diabetic patients.

Keywords: Obesity, Type 2 diabetes mellitus, Risk factors, primary health care center,makkah al-mokarramah Saudi Arabia

Introduction

The prevalence of Obesity is common in KSA, so there is a need to explore' awareness of Obesity in the primary care physicians in Makkah toward management of Obesity and type 2 diabetic. So that policymakers can devise policies to educate the young generation .[1]

The prevalence of Obesity in various regions has attracted significant attention of the medical experts. also thereby increasing disease the prevalence of diabetes and Obesity is expected to increase in the future due to changes in lifestyle and unhealthy diets of individuals in KSA.[2] More than two-thirds (70%) of patients with diabetes mellitus (DM)and Obesity reside in lower middle-income countries [3] In the medical services space, the most multiplied illness perceived over the world is diabetes. This is obvious from the expanded revealing of diabetes illness which is relied upon to arrive at a figure of 366 million [4] and expected to turn into

the seventh driving reason for death by 2030 [5].

Diabetes is a major disease burden in KSA, and we are home to the second largest number of diabetes cases in the world [6]. In 2017, With changing lifestyles the prevalence of diabetes mellitus (DM) has been rising worldwide over the past few decades. According to a recent estimate by the International Diabetes Federation, the age-adjusted prevalence of diabetes in Saudi Arabia is 17.7%.[7]. Obesity can be defined simply as the disease in which excess body fat has accumulated to such an extent that health may be adversely affected. World Health Organization (WHO) reported that obesity is one of the most common and also the most neglected, public health problems in both developed and developing countries.[8] Obesity is strongly associated with other metabolic disorders, including diabetes, hypertension, dyslipidemia, cardiovascular disease even some cancers.[9] Overweight and obesity also increases the likelihoods of suboptimal glycaemic control making it difficult to achieve glycaemic targets.[10]

In the past three decades, despite considerable advances in treatment modalities of diabetes, it has been shown considerable gaps between patients 'outcome and acceptable treatment in developed and also in developing countries. Different reasons are proposed in failure to achieve therapeutic goals such as poor adherence to treatment regimens by patients or malpractice by physicians[11]

As a result, the American Diabetes Association recommends and has developed guidelines for weight management in diabetic patients with overweight or obesity.[12] Sub-Saharan Africa is experiencing a rapidly increasing burden of obesity, diabetes and other non-communicable diseases.[15] However, there are limited reliable data on the prevalence of obesity and how this contributes to the risk of T2DM in the region. A few studies indicate that overweight and obesity affects up to half of the type 2 diabetes patients, with prevalence varying according to age and setting; 85% in Tanzania¹⁴ and 27.4%–83% in KSA.[14]

Saudi Arabia (KSA) notably has an obesity prevalence higher than the global average (35% vs. 13%).¹ Consequently, SA suffers a higher share of deaths attributable to obesity (18% vs. 8%) and a higher death rate by obesity (116.7 per 100,000 vs. 60 per 100,000).[15] In response to the immense health and social ramifications of the obesity problem, the KSA government is implementing a wide range of policies in its Vision 2030 plan for a healthier population.[16] KSA has seen progressive approaches to obesity management, such as early adoption of day case bariatric procedures.[17]

Literature Review

The results of one study in the US showed that physicians' knowledge in the treatment of diabetes was not enough and knowledge level of different medical groups such as general practitioners, specialists, internal medicine residents and medical students had significant differences with each other[18,19]

In Aseer region, Al-shahrani and Al-khaldi (2013) estimated the prevalence of obesity among 14,252 diabetic patients attended PHC centers . The prevalence of obesity among diabetic patients was 46%. About half of the diabetics had poor diabetic control, with significant association with obesity [20]

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 (21).

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 (22). In Yemen, Al-sharafi and Gunaid (2014) estimated the prevalence of obesity in patients 25 years old/above with type 2 diabetes mellitus. The prevalence of obesity among male patients ($BMI \geq 30 \text{ kg/m}^2$) was 11% whereas it was 32% among female patients [23]

Abuyassin and Laher (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 [24]

Alzaman and Ali (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[25]

Rationale:

With the changes in major lifestyles, the prevalence of obesity is increasing; therefore, this issue implicated to complicate the diabetes outcome, well -being and productivity.

Improved quality of life has been regarded as a key goal of all healthcare interventions including a special interest in obesity and its related complication, particularly in type II diabetic patient's obesity and affected to diabetes mellitus management. Up to the researcher's knowledge the prevalence of obesity is increasing; therefore, this issue implicated to complicate the diabetes outcome.

The study aimed

To assessment prevalence of the obesity and effected in type 2 diabetes and obesity-related risk factors on patients attending in primary health care center in makkah al-mokarramah.

Methodology

Study design:

Cross-sectional design in the present study

Study area and population:

Patients type 2 Diabetic patients who registered in primary health care center in Makkah at the time of study conduction.

Inclusion criteria

- Patients type 2diabetic.
- Both males and females.

Sample size:

Sample size was calculator by Raosoft Online sample size calculator It was 200 patients, based on assumption that during the last 4 weeks, the total number of diabetic patients who visited the primary health care center in Makkah PHCC was 200 patients, prevalence was considered as 50%, confidence level was 95%, margin of error was 5%. By adding 10% for defaulter and non-respondent, 200 patients were invited to participate in the study.

Sampling technique

Systematic sampling technique was used. Approximately 25 patients visit the PHC center daily. Ten patients were selected daily by choosing every other patient. Thus, nearly 14 working days were needed to collect the sample

Data collection tool

Self-administrated questionnaire was used for data collection. It was adopted from a

previous Saudi study.⁽⁵⁾ Some modifications were done and the new format was validated by three consultants (family medicine, Endocrinology and community medicine). The final draft of the questionnaire consists of two sections:

- First section: Includes socio-demographic and personal characteristics of the participants.
- Second section: Includes associated factors with obesity in type II diabetic patients (physical exercise, diet habit. Additionally, the body mass index (BMI) was calculated by an expert nurse.

Data Collection technique

- During the study period (January to February 2021), the researcher was available at the involved primary healthcare centers 4 days in the week to clarify any issue.
- The researcher distributed the questionnaire in the waiting area by themselves to the selected patients.
- The questionnaires were collected at the same time.

Data entry and analysis

Data were entered and analyzed using the Statistical Package for Social Sciences (SPSS version 24). Categorical variables were presented as frequency and percentage whereas continuous variables were presented as mean and standard deviation ($\pm$ SD).

Statistical significance was determined at $p < 0.05$ for all comparisons.

Pilot study/pretesting

A pilot study was conducted on 20 patients, representing approximately 10% of the sample size. It was done in another PHCC rather than those involved in the study to test the clarity of the questions and feasibility of the methodology. No modifications were made according to the pilot results.

Ethical considerations

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. All collected data were kept confidential.

Results

Table 1. Distribution of Socio-demographic characteristics of the studied participated (Age, Gender, Marital status, Level of education)(n=200)

	N	%
Age		
<35	82	41
35-60	68	34
>60	50	25
Sex		
Male	84	42
Female	116	58
Marital status		
Single	24	12
Married	132	66
Divorced	26	13
Widowed	18	9
Occupation		
Homemaker	68	34
Government employee	32	16
Non-government employee	12	6
Self-employed	10	5
Retired	58	29
Unemployed	20	10
Income level		
Below 5000 SR	84	42
5000 – 10000 SR	70	35
10,000 – 20,000 SR	28	14
Above 20,000 SR	18	9
Educational level		
Illiterate	32	16
Primary school	30	15

Intermediate school	20	10
Secondary school	44	22
College/University	38	19
Postgraduate degree	36	18

Table 1 show the total number of participants was 200 regarding the age most participants were classified into 3 age groups, most of them were (41.0%) in the <35 years followed by 35-60 years were (34.0%), regarding gender of participated female were (58.0%), regarding Marital status the majority of participated Married were (66.0%). regarding Occupation most of participated homemaker were (34.0%), Regarding Income level in study the most of participant's Below 5000 SR were (42.0%) . Regarding Educational level in study the most of participant's Secondary school were (22.0%)

Table 2 Distribution of the habitual factors associated of the studied participated

	N	%
What type of treatment do you use for diabetes?		
Tablets	108	54
Tablets with insulin	44	22
Insulin	48	24
Do you have any complications from diabetes?		
Yes	84	42
No	116	58
If you have any complication, please select it?		
Complication on foot	13	15.48
Complication on eye	29	34.52
Complication on kidney	8	9.52
Cardiovascular complication	19	22.62
Neuropathy	15	17.86

Table 2 show that what type of treatment do you use for diabetes most of participant tablets with insulin were (54.0%), complications from diabetes most of participants answer No (58.0%), follow by Yes were (42.0%) , regarding have any complication, please select it most

of participant Complication on eye were(34.52%) follow by Cardiovascular complication were (22.62%).

Table 3 Distribution of the habitual factors associated of the studied participated

	N	%
Physical activities or exercises		
No	122	61
Yes	78	39
If yes What is type of physical activities or exercises		
Walking	27	22.13
Running	55	45.08
Both	40	32.79
Do you stop aerobic exercise for two consecutive days or more per week?		
Always	75	61.48
Sometimes	35	28.69
No	12	9.84
Risk factor		
Asthma	24	12
High blood pressure	70	35
High fat and cholesterol	60	30
Emphysema or COPD	10	5
Other lung diseases Type of lung disease	6	3
Heart diseases	30	15
Arthritis or other rheumatic diseases	58	29
BMI		
Normal	84	42
Obese	116	58

Table 3 show more than half of the participants (61.0%) answer Yes practice Physical activities or exercise physical , regarding If yes What is type of physical activities or exercises the majority of the participants running were (45.08%), regarding you stop aerobic exercise for two consecutive days or more per week the majority of the participants always

were (61.48%). Regarding Risk factor the majority of the participants High blood pressure were (35.0%), regarding BMI the majority of the participants Obese were (58.0%)

Figure 1 Distribution of the risk factors associated of the studied participated

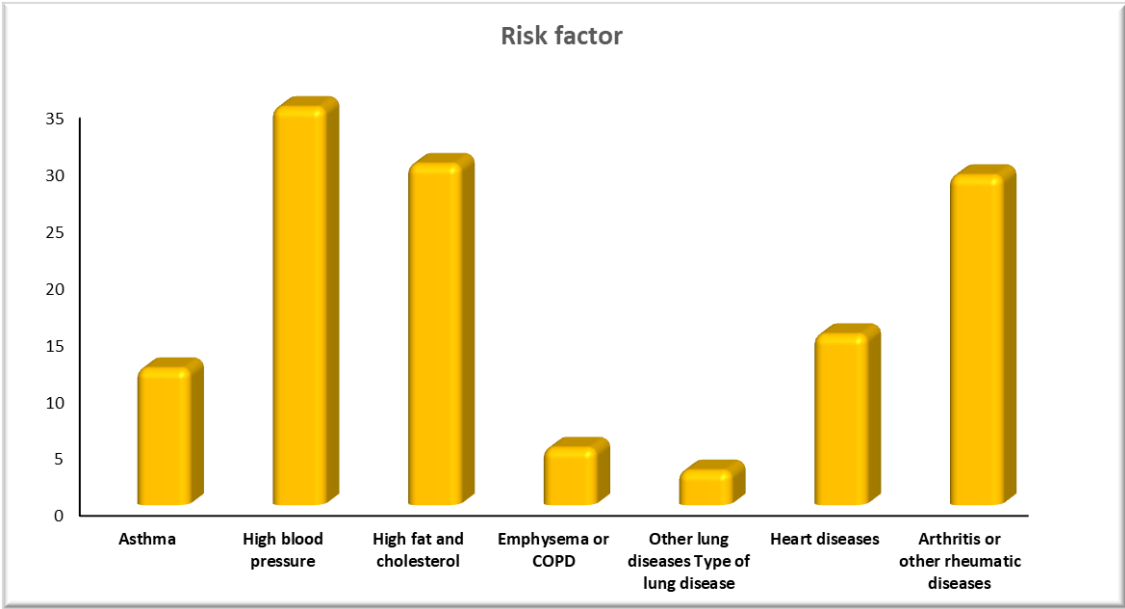


Figure 2 Distribution of the BMI associated of the studied participated

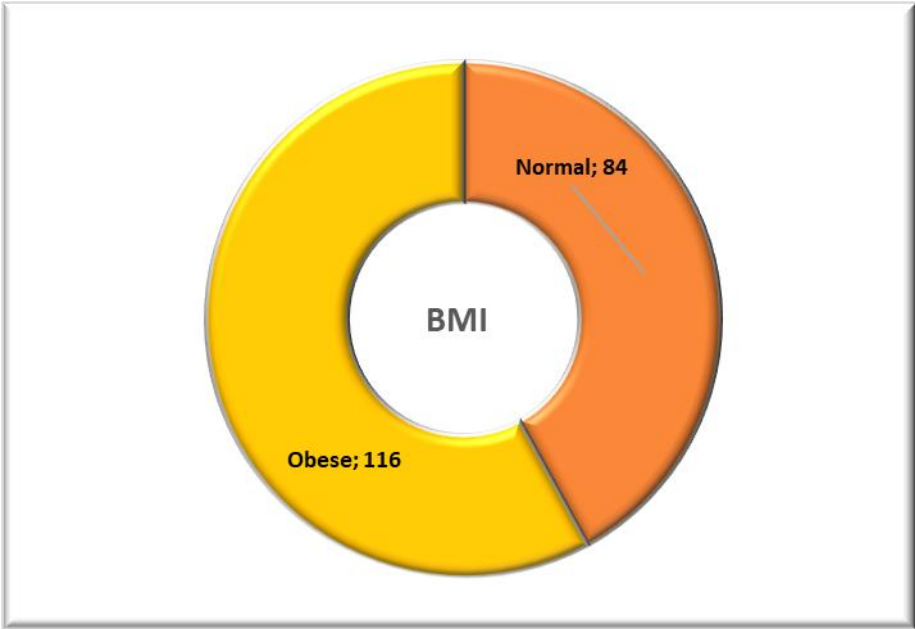


Table 4 Distribution the relation between BMI factors associated with habitual of obesity among type II Diabetes patients

		BMI				Total		Chi-square	
		Normal		Obese					
		N	%	N	%	N	%	X ²	P-value
Physical activities or exercises	No	27	32.14	95	81.90	122	61.00	48.625	<0.001*
	Yes	57	67.86	21	18.10	78	39.00		
What type of treatment do you use for diabetes?	Tablets	20	23.81	88	75.86	108	54.00	53.605	<0.001*
	Tablets with insulin	29	34.52	15	12.93	44	22.00		
	Insulin	35	41.67	13	11.21	48	24.00		
Risk factor	Asthma	5	5.95	19	16.38	24	12.00	5.016	0.025
	High blood pressure	8	9.52	62	53.45	70	35.00	41.318	<0.001*
	High fat and cholesterol	10	11.90	50	43.10	60	30.00	22.582	<0.001*
	Emphysema or COPD	2	2.38	8	6.90	10	5.00	2.091	0.148
	Other lung diseases Type of lung disease	1	1.19	5	4.31	6	3.00	1.630	0.202
	Heart diseases	5	5.95	25	21.55	30	15.00	9.298	0.002*
	Arthritis or other rheumatic diseases	12	14.29	46	39.66	58	29.00	15.229	<0.001*

Regarding physical activities or exercises, results show a significant relation between BMI and physical activities or exercises were X^2 48.625 and P-value=0.001, increase (Obese were (81.90%). Regarding what type of treatment do you use for diabetes, results show a significant relation between BMI and what type of treatment do you use for diabetes were X^2 53.605 and P-value=0.001, increase tablets and (Obese were (75.86%) Regarding risk factor, results show no significant relation between BMI and risk factor were X^2 5.016 and P-value= 0.025, increase asthma and (Obese were (16.38%),but results show a significant relation between BMI and high blood pressure while X^2 41.318and P-value= 0.001, increase High blood pressure and (Obese were (53.45%), results show a significant relation between BMI and High fat and cholesterol, Heart diseases, Heart diseases and Arthritis or other while P-value= 0.001 while Emphysema or COPD, Other lung diseases Type of lung disease were no significant relation between BMI while respective P-value=0.148 and 0.202

Discussion

The magnitude of the problem of obesity and its influence on patients with type 2 with diabetes has not attracted enough attention, and relatively few obese diabetic patients are offered the option of weight management as an integral part of their management [26] The present study aimed to assess to assessment prevalence of the obesity and effected in type 2 diabetes and obesity-related risk factors on patients attending in primary health care center in makkah al-mokarramah.Saudi Arabia.

In the current study, almost two-thirds of the type 2 diabetic patients (58.0%) were obese. This figure is higher than those reported in other similar studies carried out either locally or internationally. In Aseer region [23] . In Al-Khobar region [22] . In Jeddah [27]. In Yemen [23]. In Tanzania [25]. In the United Kingdom [21] . 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 [28]. This higher prevalence of obesity among type 2 diabetic patients in the present study over most of other similar studies necessitates greater efforts from responsible authorities to investigate the problem and find possible solutions .

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 [29]

In another study carried out in Jeddah [30] prevalence of obesity was higher in female than male patients. Also in Yemen, the prevalence of obesity among male patients was 11% whereas it was 32% among female patients [23]. In Tanzania, female diabetic patients were at almost 5-folds higher risk of overweight/obesity compared to male patients [29].

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 [25]

In another Saudi study, obesity was associated with physical inactivity and unhealthy dietary habits [30]. 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 [26]

The current study revealed that type 2 diabetic patients who treated with insulin were at higher significant risk for obesity compared to those treated with tablets. 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 [27].

Conclusion

The prevalence of obesity in KSA is greater than the global prevalence of obesity, and risk factors are multifactorial. Three intervention approaches are commonly used to treat obesity, Obesity is highly prevalent among type 2 diabetic patients. Divorced, , patients who stopped aerobic exercise for two consecutive days or more per week as well as those treated with insulin were more likely to be obese. Policymakers, public health professionals, and practitioners engaged in public health and clinical management of obesity are encouraged to use findings to expedite nationwide reductions in the prevalence of obesity in KSA.

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