

Knowledge, Attitude, and Practice Level of Using Diabetes Medication to Lose Weight for Non-Diabetic Patients

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Abstract

Obesity is the worst pandemic the world is facing currently as it has been proven to be the root of all other life-threatening conditions and is difficult to treat and manage. Anti-diabetic medications play a role in regulating metabolism by decreasing fat stores in the body indirectly. It is known that many non-diabetic people are often started on anti-diabetic therapy to target obesity and restore the metabolic balance of carbohydrates. The purpose of this study is to assess a KAP among non-diabetic patients who use diabetes medications for weight loss in Saudi Arabia. A cross-sectional study involving 32 items of questionnaire-based assessment was carried out by enrolling and taking prior consent from 384 non-diabetic Saudi people of either sex aged 18-65 years. The study included 1532 participants, 69.4% of them were females and 30.6% were males. 94.3% were Saudi. 55.8% of participants were 20- 30 years old, 15.5% were 31- 40 years old and 12.3% were less than 20 years old. Total KAP scores among participants were illustrated as 32.5% had poor knowledge, 29.3% have moderated knowledge and 38.3% have good knowledge. Total KAP scores were significantly associated with occupational status and the presence of chronic disease. The Saudi population had a pool level of knowledge, awareness, and attitude toward diabetes medications used for weight loss. Awareness campaigns should be conducted by health authorities to raise people's awareness regarding the potential complications of using these with no prescription.

Keywords: KAP study, Diabetes, Anti-diabetic medications, Weight loss.

INTRODUCTION

Obesity is characterized as an excessive or uncontrolled accumulation of fat. It is a significant chronic health issue that is getting worse every day and has an adverse impact on work productivity, life quality, and health care expenses [1]. However, One's goal to lose weight has never been easy to accomplish or keep off. Even though several randomized trials of medicines, bariatric surgery, and lifestyle changes have demonstrated that losing weight lowers morbidity. Changes in lifestyle, such as calorie restriction and increased physical activity, are simple to implement but rarely sustainable [2]. The management strategy's initial line of defense is lifestyle modifications, which have a clinically significant weight loss (5%) potential. Overweight is defined by the WHO Society as having a (BMI) exceeding 30 kg/m² [3]. Pharmacotherapy is often recommended as the second line of treatment for obesity in the majority of published guidelines from strict bodies [4].

We'll discuss the three medications Trulicity, saxenda, and Ozempic. Semaglutide which is known as Ozempic consider one of the glucagon-like peptide-1receptor agonists (GLP-1RA) that has been approved to cause weight loss in adults with obesity and type 2 diabetes when injected subcutaneously once a week at doses up to 1 mg [5]. Semaglutide (Novo Nordisk, Denmark) is a new product

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(GLP-1RA) with a 94 percent amino acid sequence homology to native GLP-1RA and a half-life of about one week that is used to treat type 2 diabetes [6]. The FDA initially approved liraglutide, which is known as Saxenda a glucagon-like peptide-1 receptor agonist (GLP-1RA), as a supplement to nutritional treatment and exercise for controlling type 2 diabetes [7]. In addition to a reduced calorie diet and increased physical activity, liraglutide 3.0 mg (Saxenda®; Novo Nordisk) has been approved for the treatment of obesity in the US, the EU, and other countries [8].

Dulaglutide which is known as Trulicity consider one of the GLP-1 agonists nowadays used for weight management. Similar to other agents in the class dulaglutide has demonstrated weight loss of approximately 6 pounds, over at least 6.5 months [9]. Dulaglutide (Trulicity, Eli Lilly and Company; FDA- approved in September 2014, administered via once-weekly injections [9]. Most GLP-1 agonist agents share the same side effects which are gastrointestinal (GI) in nature such as nausea, vomiting, diarrhea, and constipation [10].

Over the past forty years, the incidence of obesity has significantly increased worldwide, rising from less than 1 percent in 1975, to 6-8percent in 2016 [11]. In Saudi Arabia specifically, the prevalence is greater than the global-prevalence-of obesity, which accounts for 35.6% [12]. Lifestyle interventions are crucial for the management of obesity in the SA guideline. The emergence of more anti-obesity medications has persuaded young people to spend more money on them, particularly GLP-1 agonists. In a large study conducted in the United States, the use of anti-obesity medications remained very low: only 0.5% of the eligible population used anti-obesity medication [13]. However, SA holds the highest market share of anti-obesity medications such as GLP-1 agonists in the Middle East and Africa [12].

In 2020, a cross-sectional study among Saudi women about using of weight-lowering pharmaceuticals to change morphological indices has been published. According to the findings, the predominant weight-loss techniques among them were diets and exercise, with 21.3% of them utilizing weight-lowering. Additionally, Orlistat was the most widely used medication for weight loss [14]. Sharaf *et al.* have published a study about obesity self-management among healthy obese adults in Saudi Arabia. They reported that more than half of the individuals did not manage their obesity with any FDA-approved anti-obesity drugs was a significant finding that led to lower practice levels [15]. Recent research was done to record community pharmacists' practices on weight-loss supplements.

The investigation was carried out in residents' pharmacies in Saudi Arabia's eastern section. According to the study's discoveries, orlistat and a variety of teas were the most popular weight-loss products [16]. The purpose of this study is to assess the KAP level of using diabetes medication to lose

weight for non-diabetic patients among the population of Saudi Arabia.

MATERIALS AND METHODS

Study Design

A cross-sectional study, non-interventional, questionnaire-based study between January 2022 until November 2022. The study's population consisted of non-diabetic Saudi females and males between the age of 18-65

Inclusion and Exclusion Criteria

Inclusion criteria: Saudi, Male and female, aged 18-65 years, non-diabetic participants.

Exclusion criteria: None Saudi, younger than 18 and older than 65, diabetic participants.

Sample Size

The sample size was calculated using Raosoft sample size calculation with a 95% confidence interval and 5% confidence level; a sample size of 384. The study was used to estimate differences in respondents' level of using diabetes medication to lose weight Knowledge, attitudes, and practices Data collection sheet will include consent to participation followed by other sections.

The Sample size was estimated using the formula:

$$n = P(1-P) * Z\alpha / d^2 \text{ with a confidence level of } 95\% \quad (1)$$

n: Calculated sample size

Z: The z-value for the selected level of confidence (1- a) = 1.96.

P: An estimated prevalence of knowledge

Q: (1 - 0.50) = 50%, i.e., 0.50

D: The maximum acceptable error = 0.05.

So, the calculated minimum sample size was:

$$n = (1.96)^2 \times 0.50 \times 0.50 / (0.05)^2 = 384 \quad (2)$$

Method for Data Collection and Instrument (Data Collection Technique and Tools)

Study Questionnaire

The survey was broken down into three independent modules to assess the levels of different (KAP) components. In each module, relevant questions were asked of the respondents.

Three components were examined using the scalar-scoring methodology. There were two categories of inquiries. The questions having two possible answers were given 1 point for a correct response and zero points for a wrong or uncertain response. The other type of questions had 3 levels of scores, 0, 1, & 2 representing Poor, Fair, and Good level of Knowledge, Attitude, or Practice. The total KAP score is used to rank the level of knowledge, attitude, and practice, and subsequent qualitative analysis was conducted to rank high, medium, and low scores.

Overall, there were 32 questions in the questionnaire, 8 for demographic characteristics, 11 for knowledge, 6 for attitude, and 6 for practice. If a person answered all questions correctly, 29 scoring points were awarded.

High-level responders were those who received a KAP score of 20 or higher, while the scores between 15 and 20 were considered medium level. The score below 15 was considered a low level.

Pilot Test

The questionnaire was distributed to 20 individuals and asked to fill it out. This was done to test the simplicity of the questionnaire and the feasibility of the study. Data from the pilot study were excluded from the final data of the study.

Analysis and Entry Method

The computer's "Microsoft Office Excel Software" (2021) program was used to input data. Then, the data was transmitted to the SPSS application, version 27 (IBM SPSS-Statistics) for Windows, Version 27.0; Armonk, NY: IBM Corp.), where it was statistically examined.

RESULTS AND DISCUSSION

The study included 1532 participants, 69.4% of them were females and 30.6% were males. 94.3% were Saudi. 58.7% were single and 38.5% were married. 55.8% of participants were 20- 30 years old, 15.5% were 31- 40 years old and 12.3% were less than 20 years old. Almost half study participants were from Riyadh. 58.5% of participants had bachelor's degrees and 35.5% had high school diplomas. 13.3% of participants have a chronic disease (**Table 1**).

Table 1. Sociodemographic-characteristics of participants (n=1532)

Parameter	No.	%	
Gender	Male	469	30.6
	Female	1062	69.4
Nationality	Saudi	1443	94.3
	Non- Saudi	88	5.7
Marital status	Single	898	58.7
	Married	590	38.5
	Divorced or widow	43	2.8
Age	Less than 20	189	12.3
	20-30	854	55.8
	31-40	237	15.5
	41-50	167	10.9
	51-60	65	4.2
	More than 60	19	1.2
City of residence	Al-Baha	2	.1
	Arar	3	.2
	Asir	32	2.1
	Buraidah	32	2.1
	Dammam	92	6.0
	Ha'il	3	.2
	Jazan	96	6.3
	Jeddah	151	9.9
	Madinah	86	5.6
	Makkah	167	10.9
	Najran	2	.1
	Riyadh	699	45.7
	Skaka	1	.1
Tabuk	6	.4	
Alahsa	159	10.4	
Educational Qualification	High school Diploma	540	35.3
	Bachelor's Degree	902	58.9
	Master's Degree	70	4.6
	Ph.D. Degree or above	19	1.2
Occupation	Government Employee	374	24.4
	Private Sector Employee or self-employed	199	13.0
Chronic disease	Unemployed	958	62.6
	Yes	204	13.3
	No	1327	86.7

(**Table 2**) shows that most of the participants (88.8%) did not have DM. 54.4% of participants report they don't know if (Saxenda, Ozempic, and Trulicity) can be used for children

and adolescents. Regarding (Saxenda, Ozempic, and Trulicity) which can be used without a doctor's prescription 60% of participants chose no. 63.3% of participants did not

know if the use of (Saxenda, Ozempic, and Trulicity) may cause dependency or not.

Table 2. Knowledge of anti-diabetes medications among study participants (n= 1532)

Parameter	Yes	No	Don't know
Are you a diabetic patient?	92 6.0%	1360 88.8%	79 5.2%
Do you use Trulicity injections?	30 2.0%	1457 95.2%	44 2.9%
Do you use Saxenda injections?	54 3.5%	1424 93.0%	53 3.5%
Do you use Ozempic injections?	75 4.9%	1397 91.2%	59 3.9%
Do you use Trulicity or Saxenda or Ozempic injections to lose weight?	122 8.0%	1360 88.8%	49 3.2%
(Saxenda, Ozempic, and Trulicity) are Adults who utilize injectable prescription drugs with excess weight (BMI ≥27) who also have medical problems or obesity (BMI ≥30)?	575 37.6%	245 16.0%	711 46.4%
(Saxenda, Ozempic, and Trulicity) can be used for children and adolescents?	199 13.0%	499 32.6%	833 54.4%
Use of (Saxenda, Ozempic, and Trulicity) are safe?	426 27.8%	271 17.7%	834 54.5%
(Saxenda, Ozempic, and Trulicity) can be used without a doctor's prescription?	87 5.7%	919 60.0%	525 34.3%
(Saxenda, Ozempic, and Trulicity) can be used for pregnant or breastfeeding women	77 5.0%	569 37.2%	885 57.8%
(Saxenda, Ozempic, and Trulicity) is effective for weight loss without diet and exercise	289 18.9%	472 30.8%	770 50.3%
(Saxenda, Ozempic, and Trulicity) cannot cause serious side effects?	352 23.0%	228 14.9%	951 62.1%
Continuous use of (Saxenda, Ozempic, and Trulicity) may cause dependency ?	300 19.6%	262 17.1%	969 63.3%
you can start using (Saxena, ozempic, and trulicity) by any dose you want?	47 3.1%	874 57.1%	610 39.8%

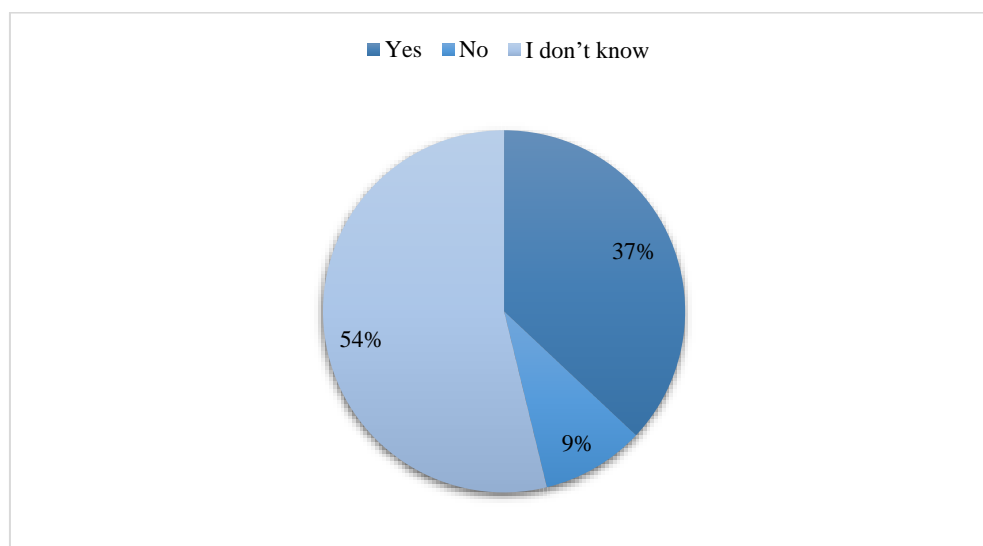


Figure 1. Knowledge assessment among study participants about Most of (Saxenda, Ozempic, and Trulicity) side effects are GI in nature such as (nausea, vomiting diarrhea, or constipation) (n= 1532)

Total KAP scores among participants were illustrated as 32.5% had poor knowledge, 29.3% have moderated knowledge and 38.3% have good knowledge (**Figure 2**).

Total KAP scores were significantly associated with occupational status and the presence of chronic disease (P< 0.05)

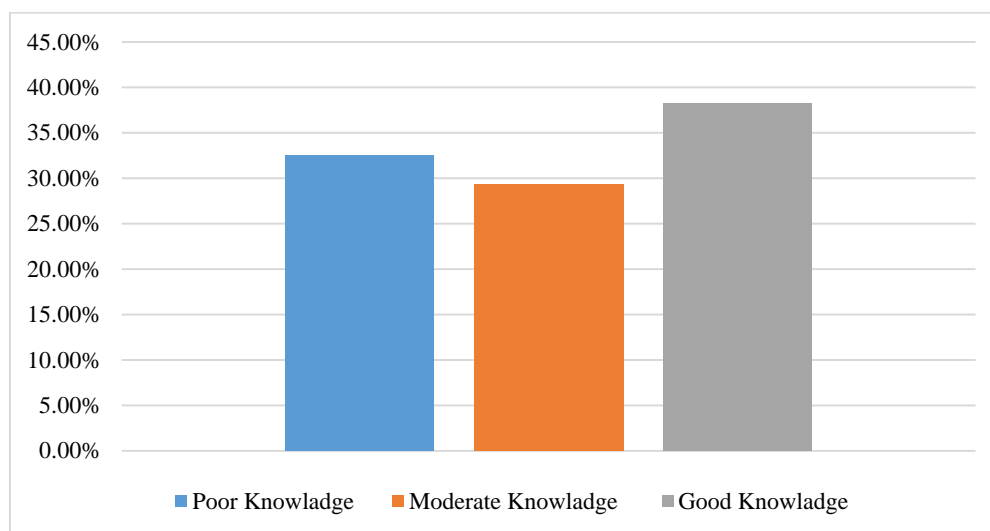


Figure 2. Total KAP score of knowledge, attitude, and practice (n= 1532)

Table 3. Association between knowledge score with sociodemographic characters among participants (n=1523)

		Total KAP			Total (N=1532)	P value
		Low	Moderate	High		
Gender	Male	156 31.4%	135 30.1%	178 30.4%	469 30.6%	0.903
	Female	341 68.6%	313 69.9%	408 69.6%	1062 69.4%	
Nationality	Saudi	459 92.4%	429 95.8%	555 94.7%	1443 94.3%	0.067
	Non- Saudi	38 7.6%	19 4.2%	31 5.3%	88 5.7%	
Age	less than 20	56 11.3%	67 15.0%	66 11.3%	189 12.3%	0.136
	20 -30	275 55.3%	252 56.3%	327 55.8%	854 55.8%	
	31 - 40	71 14.3%	76 17.0%	90 15.4%	237 15.5%	
	41 -50	64 12.9%	36 8.0%	67 11.4%	167 10.9%	
	51 - 60	22 4.4%	13 2.9%	30 5.1%	65 4.2%	
	more than 60	9 1.8%	4 0.9%	6 1.0%	19 1.2%	
Marital status	Married	220 44.3%	159 35.5%	211 36.0%	590 38.5%	0.012
	Single	266 53.5%	279 62.3%	353 60.2%	898 58.7%	
Educational Qualification	Divorced or widow	11 2.2%	10 2.2%	22 3.8%	43 2.8%	0.171
	High school Diploma	177 35.6%	165 36.8%	198 33.8%	540 35.3%	
	Bachelor's Degree	295 59.4%	265 59.2%	342 58.4%	902 58.9%	
	Master's Degree	19 3.8%	16 3.6%	35 6.0%	70 4.6%	
Occupation	Ph.D. Degree or above	6 1.2%	2 0.4%	11 1.9%	19 1.2%	0.001
	Government Employee	111 22.3%	90 20.1%	173 29.5%	374 24.4%	
		72	46	81	199	

	Private Sector Employee or self-employed	14.5%	10.3%	13.8%	13.0%	
	Unemployed	314 63.2%	312 69.6%	332 56.7%	958 62.6%	
Chronic Diseases	Yes	55 11.1%	55 12.3%	94 16.0%	204 13.3%	0.041
	No	442 88.9%	393 87.7%	492 84.0%	1327 86.7%	

The estimated prevalence of obesity has doubled over the past 15 years, and it has become a pandemic health problem. According to the World Health Organization, 1.9 billion adults worldwide (or roughly 40%) were overweight or obese in 2016, and of these, 650 million were obese [17].

The effects on weight growth, weight maintenance, and weight loss vary throughout pharmaceutical classes and may even differ slightly within each class. The various drug classes will be discussed, along with how they affect patients with type 2 diabetes and, when applicable, those with type 1 diabetes, in terms of weight [18].

Type 2 diabetes (T2D), dyslipidemia, hypertension, atherosclerotic cardiovascular disease, and heart failure are all conditions related to being overweight or obese, and intra-abdominal adiposity in particular [19]. Obesity is also associated with a number of musculoskeletal, pulmonary, renal, gastrointestinal, and mental disorders. As a result, there are significant ramifications for both society and the quality of life of the affected person, including increased healthcare costs [20].

A limited number of drugs have been approved by the FDA for the treatment of obesity. Recently, several DM medications were used for weight loss purposes without prescription which may lead to complications. Thus, this study was conducted to assess the knowledge, attitude, and practice level of using diabetes medication to lose weight among non-diabetic patients among the population of Saudi Arabia.

The therapy of T2D is permitted for selective sodium-glucose co-transporter 2 (SGLT2) inhibitors, which provide an insulin-independent strategy for lowering blood glucose levels. They encourage the excretion of urinary glucose by preventing (by as much as 50%) the proximal tubule of the kidney from reabsorbing glucose from urine. The amount of glucosuria that results is proportional to the amount of plasma glucose that is above the threshold [21-23].

Both SGLT2 inhibitors (such as dapagliflozin, canagliflozin, and empagliflozin) and (glucagon-like-peptide-1-receptor-agonists) (GLP1-RAs; such as exenatide, liraglutide, and semaglutide) are used to treat T2D, but they also cause bodyweight loss that is primarily due to a decrease in body fat. Additionally, these medication types have long-lasting effects on body weight and glycemic control [24, 25]. However, both in T2D and in obesity without diabetes, the

amount of weight loss is rather moderate. An average weight reduction of 1.5 to 2 kg (placebo-adjusted) is seen with approved SGLT2 inhibitors, 2-4 kg with GLP1-RAs, and 3-5 kg with the combo [26, 27].

By inducing the kidneys to eliminate glucose, which reduces calories, SGLT2 inhibitors-directly lower body weight. Amounts of 60–100 g of glucose per day may be eliminated in the urine as a result of SGLT2 inhibition, which functions in a glucose-dependent way. Whether patients are receiving SGLT2 inhibitors as monotherapy or in combination with other glucose-lowering medications, weight reduction with SGLT2 inhibitor therapy has been consistently seen in various studies in T2D [28].

Due to an adaptive increase in energy intake, including compensatory increases in hunger and caloric intake, SGLT2 inhibitors significantly reduce weight loss compared to what would be expected from the energy expelled via glycosuria [29]. Thus, the most efficient method for significant weight reduction and the treatment of counter-regulatory processes that maintain body weight may involve combining SGLT2 inhibitors with medicines that work by various mechanisms. The co-administration of SGLT2 inhibitors with other kinds of medications has shown encouraging effects in recent studies. For instance, the DURATION-8 research showed that in patients with T2D, the mean body weight reduction was larger with the combination of exenatide (a GLP1-RA that suppresses appetite) and dapagliflozin (an SGLT2 inhibitor) than with the monotherapies alone [30].

L cells in the small and large intestine and (neurons in the nucleus-tractus-solitarius; NTS) of the caudal brain stem both secrete the peptide known as glucagon-like peptide-1 (GLP-1). Long-acting GLP-1 analogs are currently used as pharmacological treatments for Type 2 diabetes mellitus because of the powerful incretin effects of GLP-1. Additionally, these substances lower food intake and body weight [31].

Liraglutide, often known as Saxenda, is a GLP-1 analog that the Food-and-drug Administration licensed for use in treating obesity-related weight reduction in December 2014. Although this was a very positive development for drugs that target the GLP-1 system to treat obesity, patients taking liraglutide only experience modest weight loss (5–10% weight loss is typical), and 30–40% of patients report frequent episodes of nausea, which can cause discontinuation in 10% of patients [32]. Therefore, basic science research into

the neurobiology of GLP-1-mediated decreases in food intake and body weight is required to help direct the development of future GLP-1-based obesity pharmacotherapies (mono or combination therapies) that, when compared to existing GLP-1 analogs, achieve a higher degree of weight loss while achieving a lower prevalence of nausea and other concomitant negative side effects [33, 34].

CONCLUSION

The Saudi population had a pool level of knowledge, awareness, and attitude toward diabetes medications used for weight loss. Awareness campaigns should be conducted by health authorities to raise people's awareness regarding the potential complications of using these with no prescription.

Recommendations

We recommend that further educational campaigns should be inaugurated to raise awareness and attitude towards diabetes medications used for weight loss.

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