Original Article

KSA Patients with Obesity: Their Knowledge and Awareness Level of the Side Effects of Ozempic

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Abstract

Semaglutide (Ozempic), FDA-approved for type 2 diabetes in 2017, has garnered attention for inducing weight loss through satiety triggers, delaying stomach emptying, and reducing appetite. Our aims to determine the amount of awareness among obese patients in KSA regarding the potential adverse effects of Ozempic. A cross-sectional questionnaire survey was conducted in KSA, involving adult obese individuals. Participants under 18, non-Saudi citizens, and non-obese individuals were excluded. The sample size were determined using the Raosoft calculator, establishing a minimum sample size of 377 at a 95% confidence level with a 5% maximum marginal error. Statistical analysis was performed using SPSS 27. A total of 1449 individuals participated. The data indicates that 73.8% of respondents exhibited "poor awareness," while 21.9% displayed "moderate awareness," and 4.3% showed "high awareness." Notably, the highest percentage of individuals with high awareness scores was in the 21-30 age group (45.9%), whereas individuals older than 60 had the lowest percentage (3.9%), revealing a significant association with age (p-value=0.017). Gender also played a significant role in awareness scores, with females having a notably higher percentage of individuals with high awareness (71.7%) compared to males (28.3%) (P-value=0.010). The study revealed extremely low levels of awareness among participants. Age and gender demonstrated significant associations with awareness scores. This highlights a critical need for targeted interventions in healthcare. Improving health outcomes for obese patients in KSA necessitates healthcare practitioners' focused efforts on enhancing patient education, mitigating cultural and language barriers, and fostering collaborative decision-making processes.

Keywords: Ozempic, Semaglutide, Obesity, KSA

Introduction

Semaglutide, commonly known as Ozempic, received FDA approval in 2017 as a treatment for type 2 diabetes, with recent studies highlighting its efficacy in inducing substantial weight loss in both diabetic and non-diabetic patients [1]. As a member of the Glucagon-like peptide-1 (GLP-1) family, Semaglutide functions as a gastric hormone released by intestinal L cells, stimulating insulin production while suppressing glucagon in a glucose-dependent manner, facilitating glucose uptake into peripheral tissues [2]. Its impact on reducing energy intake by slowing gastric emptying leads to diminished appetite and body weight, complemented by its effect on decreasing circulating leptin levels, further aiding in weight reduction [3, 4].

Globally, obesity affects over 650 million adults, accounting for almost thirteen percent of the adult population [5]. Obesity incurs substantial social and economic burdens, with estimated global health expenditures on obesity-related issues projected to reach twelve trillion dollars by 2025. Despite the limited efficacy of preventive measures, even a modest 5-10% reduction in body weight can significantly alleviate associated comorbidities and enhance overall quality of life [6]. Notably, obesity significantly elevates mortality and morbidity risks in individuals with diabetes, contributing substantially to heart disease and diabetes-related fatalities, which were primary causes of death globally in 2015 among individuals with higher Body Mass Index [7].

The SUSTAIN 6 study, conducted over a 2-year period demonstrated that Semaglutide significantly decreased the

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risk of cardiovascular events in high-risk cardiovascular disease patients compared to a placebo [8]. Concerns have arisen post-approval regarding the long-term safety and tolerability of Semaglutide in clinical settings, notably due to gastrointestinal (GI) adverse effects such as diarrhea, constipation, nausea, or vomiting [9]

Studies conducted in 2023 in various regions of Saudi Arabia highlighted limited awareness regarding GLP-1 drugs and weight management medications, particularly among the population's understanding of Semaglutide (Ozempic) and its potential side effects [10-12]. Despite the increasing use of Ozempic, there seems to be a significant knowledge gap among this demographic regarding its possible adverse effects. Addressing this gap is critical, especially concerning the medication's safety profile post-approval. Thus, this study aims to assess and evaluate the level of knowledge and awareness, specifically regarding the side effects of Ozempic among obese patients in Saudi Arabia.

Materials and Methods

Study Design

A cross-sectional questionnaire survey was conducted in Saudi Arabia between August and November 2023.

Study Settingand Participants

The study's population

The study involved the recruitment of adult individuals, including both Saudi nationals and non-citizens, encompassing both genders. Inclusion criteria stipulated participation for adults aged 18 and above who met the criterion for obesity, defined as having a Body Mass Index (BMI) of 30 kg/m² or higher. Exclusion criteria excluded individuals under the age of 18, non-Saudi citizens, and those not meeting the criteria for obesity.

Sample Size

The sample size was calculated by the Raosoft calculator with a confidence level of 95% and the maximum acceptable marginal error of 5%. The minimum sample size was 377.

Data Collection

The questionnaire and scoring system was developed based on existing research studies [11], divided into two distinct sections, served as the primary method for data collection. The initial section aimed to gather demographic information, ensuring participants met the specified inclusion criteria. Following this, the subsequent section examined participants' perceptions and awareness regarding anti-obesity medications, encompassing inquiries on indications, eligibility, mode of action, side effects, effectiveness, and potential complications.

Responses provided by participants were systematically scored, with correct answers receiving a point and incorrect responses marked as zero. These scores were utilized to categorize participants into distinct awareness levels: scores of 8 or below denoted poor awareness, 9-10 suggested moderate awareness, and scores of 11 or higher indicated high awareness, with a maximum achievable score of 13.

Data Analysis

Upon collection through Google Forms, the data were organized and indexed using Microsoft Excel for initial review and preparation. Subsequently, the compiled dataset was subjected to rigorous statistical analysis and interpretation, facilitated by SPSS 27. This analytical phase aimed to derive insights, trends, and correlations within the dataset, enabling a comprehensive understanding of participants' perceptions and awareness levels regarding anti-obesity medications. The analysis involved correlation assessments and calculation of p-values to determine associations between variables, such as age, gender, geographic location, educational level, and awareness scores. Additionally, chi-square tests were employed to establish the significance of relationships between categorical variables. P-values were considered significant if they were less than 0.05. This threshold was used to determine the statistical significance of associations, correlations, or differences between variables in the study.

Results and Discussion

The distribution of participants, as indicated in **Table 1**, exhibited varied demographics. Among the age groups, the majority (45.9%) fell within the 21-30 range, followed by 17.0% in the 18-20 bracket, with a noticeable decline in percentages as the age range increased, totalling only 3.9% for participants over 60 years old. In terms of gender, a significant majority (71.7%) of participants were female. Geographically, the highest percentage of participants (42.9%) hailed from the South region, while the West accounted for 24.9%. The Middle, North, and East regions represented comparatively lower percentages at 14.8%, 11.0%, and 6.4%, respectively. Regarding educational qualifications, the majority (57.3%) held a bachelor's degree, followed by 18.7% with a secondary education. A smaller proportion possessed a diploma (10.9%) or a postgraduate degree (4.1%). 28.4% of respondents were employed in health-related fields, while 71.6% were not.

Table 1. Sociodemographic characteristics of participants (n=1449)

Parameter		No.	%
Age	18_20	247	17.0
	21_30	665	45.9
	31_40	220	15.2
	41_50	187	12.9
	51_60	74	5.1
	more than 60	56	3.9
Gender	Male	247	17.0
	Female	1039	71.7
Location	East	93	6.4

	Middle	215	14.8
	North	159	11.0
	South	621	42.9
	West	361	24.9
Education Level	uneducated	28	1.9
	primary	29	2.0
	middle	57	3.9
	secondary	271	18.7
	diploma	158	10.9
	Bachelor's	830	57.3
	Postgraduate	60	4.1
	Other	16	1.1
Do you work in a health-related job	Yes	411	28.4
	No	1038	71.6

The survey findings in **Table 2** indicate that among those surveyed, 52.4% had prior knowledge about anti-obesity medications, compared to 47.6% who did not. The primary information sources included the internet (34.6%), doctors (18.9%), and relatives (16.1%).

Regarding the use of anti-obesity medications for weight loss, 29.3% of respondents believed in its effectiveness, while 70.7% did not support this idea. Participant knowledge varied on the body mass index (BMI) threshold for using these medications in disease-free individuals, with 29.3% citing a BMI of 30 or higher and 27.0% indicating a BMI of 35 or higher.

In understanding the mechanism of action, 62.3% believed these medications promote satiety, reduce appetite, and diminish fat absorption. A substantial 76.6% affirmed that these medications could lead to a weight reduction of 3-8 kg per year.

The survey further explored participants' awareness of potential side effects associated with anti-obesity medications. The most recognized side effects were nausea and vomiting, acknowledged by 64.9% of respondents. About 40.9% were familiar with the possibility of experiencing diarrhoea and constipation, while a similar percentage, 40.7%, recognized dizziness and headaches. Interestingly, 57.8% believed that these medications might also induce depression and mood swings, demonstrating a notable perceived association. However, only 42.2% were aware that depression and mood swings were not listed as potential side effects. When participants were questioned about potential risks linked to anti-obesity medications, 71.0% were aware of the increased risk of pancreatitis, while 63.3% recognized the potential elevation in the risk of thyroid tumours.

Interestingly, 24.1% perceived anti-obesity medications as more effective without diet and exercise, while 75.9% disagreed. Lastly, when asked about using these medications if recommended by their doctor, 60.9% were inclined to do so, while 39.1% were not.

Table 2. Knowledge and awareness of participants about side effects of Ozempic

Parameter		No.	%
Do you work in a health-related job	Yes	411	28.4
	No	1038	71.6
Do you have any information about anti-obesity medications before?	Yes	760	52.4
	No	689	47.6
The source of information	Relatives	233	16.1
	Internet	502	34.6
	Television	56	3.9
	Doctor	274	18.9
	Books	136	9.4
	Other	248	17.1
Do you think that anyone can use anti-obesity medications to lose weight?	Yes	424	29.3
	No	1025	70.7
Based on your knowledge, what is a certain percentage of the body mass index that allows the use of these medications in people who enjoy disease-free health?	Body mass index greater than or equal to 25	258	17.8
	Body mass index greater than or equal to 30	424	29.3
	Body mass index greater than or equal to 35	391	27.0
	Body mass index greater than or equal to 40	376	25.9
In your opinion, what is the mechanism of action of anti-obesity drugs on the human body?	Promote satiety	126	8.7
	Reduces appetite	288	19.9
	Reducing fat absorption	132	9.1
	all of the above	903	62.3
Do you think that these medications reduce 3-8 kg per year?	Yes	1110	76.6
	No	339	23.4
Which of the following do you think is a side effect of these medications?	Diarrhea and constipation	593	40.9
	Nausea and vomiting	941	64.9
	Depression and mood swings	838	57.8
	Dizziness and headache	590	40.7
	Other	186	12.8
Based on your knowledge, anti-obesity medications may increase the risk of pancreatitis:	Yes	1029	71.0
	No	420	29.0
Based on your knowledge, anti-obesity medications may increase the risk of thyroid tumors:	Yes	917	63.3
	No	532	36.7
Do you think that anti-obesity medications are more effective without diet and exercise:	Yes	349	24.1
	No	1100	75.9
If your doctor advised you to use anti-obesity medications, would you use them?	Yes	882	60.9
	No	567	39.1

Figure 1 illustrates the distribution of awareness levels among the respondents. The data indicates that the majority

of respondents, comprising 73.8% of the total, fall into the category of "poor awareness." Conversely, 21.9% of respondents demonstrate "moderate awareness." Finally, the smallest proportion, accounting for 4.3%, falls into the "high awareness" category.

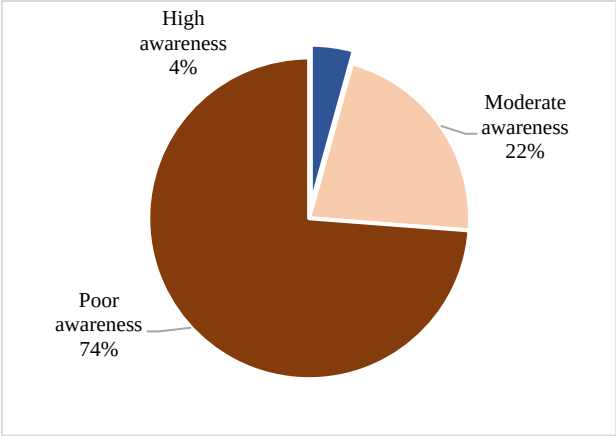

Figure 1. Awareness score for participants regarding the level of side effects of Ozempic

Table 3 outlines the awareness scores categorized as poor, moderate, and high. Across different age groups, the highest percentage of individuals with high awareness scores (45.9%) was in the 21-30 age bracket. Conversely, the older than 60 age group had the lowest percentage, with only 3.9% attaining a high awareness score. The association between age and awareness scores was significant, with a p-value of 0.017.

In terms of gender differences, there was a significant contrast in awareness scores, indicated by a p-value of 0.010. Females exhibited a substantially higher percentage of individuals with high awareness scores (71.7%) compared to males (28.3%).

Geographically, the South region displayed the highest percentage of individuals with high awareness scores (42.9%), while the East region exhibited the lowest (6.4%). However, this discrepancy didn't yield statistical significance, recording a p-value of 0.216 Moreover, in assessing education levels, there wasn't a marked difference in awareness scores. Nevertheless, individuals holding a bachelor's degree recorded the highest percentage of high awareness scores (57.3%), while those without formal education had the lowest (1.9%).

Table 3. Association between sociodemographic characters and awareness of participants about side effects of Ozempic (n=1449)

		Awareness score			Total (N=1449)	P value
		Poor awareness	Moderate awareness	High awareness		
Age	18_20	**191**	**47**	**9**	**247**	0.017
		13.2%	3.2%	0.6%	17.0%	
	21_30	462	171	32	665	
		31.9%	11.8%	2.2%	45.9%	
	31_40	164	43	13	220	
		11.3%	3.0%	0.9%	15.2%	
	41_50	145	36	6	187	
		10.0%	2.5%	0.4%	12.9%	
	51_60	65	7	2	74	
		4.5%	0.5%	0.1%	5.1%	
	more than 60	43	13	0	56	
		3.0%	0.9%	0.0%	3.9%	
Gender	Male	281	111	18	410	0.010
		19.4%	7.7%	1.2%	28.3%	
	Female	789	206	44	1039	
		54.5%	14.2%	3.0%	71.7%	
Location	East	63	24	6	93	0.216
		4.3%	1.7%	0.4%	6.4%	
	Middle	152	48	15	215	
		10.5%	3.3%	1.0%	14.8%	
	North	112	40	7	159	

		7.7%	2.8%	0.5%	11.0%	
	South	465	136	20	621	
		32.1%	9.4%	1.4%	42.9%	
	West -	278	69	14	361	
		19.2%	4.8%	1.0%	24.9%	
	uneducated	18	2	8	28	
		1.2%	0.1%	0.6%	1.9%	
	Primary	27	1	1	29	
		1.9%	0.1%	0.1%	2.0%	
	Middle	44	3	10	57	
		3.0%	0.2%	0.7%	3.9%	
	secondary	208	7	56	271	
Education Level		14.4%	0.5%	3.9%	18.7%	0.064
	Diploma	106	7	45	158	
		7.3%	0.5%	3.1%	10.9%	
	Bachelor's	620	38	172	830	
		42.8%	2.6%	11.9%	57.3%	
	Postgraduate	37	4	19	60	
		2.6%	0.3%	1.3%	4.1%	
	Other	10	0	6	16	
		0.7%	0.0%	0.4%	1.1%	

Addressing obesity among KSA patients and their awareness of Ozempic's side effects is crucial. Obesity remains a significant public health concern in Saudi Arabia, impacting both adults and children and contributing to various comorbidities such as diabetes, cardiovascular disease, and certain cancers [4]. Medications like Ozempic (Semaglutide) have emerged as potential aids in obesity management, offering weight reduction and improved glycemic control for individuals with obesity and type 2 diabetes. However, as with any medication, Ozempic carries potential side effects that necessitate patient awareness and understanding [1, 2]. One of the key challenges in managing obesity among KSA patients revolves around their limited knowledge and awareness regarding potential medication side effects. Inadequate understanding may impact treatment adherence and overall health outcomes. Healthcare providers must address this gap by educating patients about Ozempic's potential side effects and addressing any misconceptions or concerns patients might have [12]. Furthermore, cultural and language barriers may also contribute to the lack of awareness among Saudi patients. Healthcare providers need to take these factors into consideration and provide culturally sensitive and language-appropriate education to ensure that patients have a clear understanding of the potential side effects of Ozempic [12]. This study is the first investigation in Saudi Arabia that evaluates the knowledge and awareness level of side effects of Ozempic.

In this study, the majority of participants demonstrated poor awareness scores, with almost three-quarters (73.8%) falling into the category of low awareness. Only a small fraction (4.3%) exhibited a high level of awareness regarding the side effects of Ozempic. This aligns with research conducted in Saudi Arabia that evaluated knowledge and attitudes about weight management drugs (WMMs) among the general community. That study uncovered insufficient knowledge and a cautious approach toward WMMs, despite the high prevalence of obesity. Interestingly, prior usage of WMMs correlated with a better understanding and more positive attitudes toward these medications [12]. Moreover, a study conducted by Al-Khaldi *et al*. found that only 10% of practitioners possessed adequate knowledge about the appropriate use of WMMs [13].

Similarly, a study carried out in the Aseer region of Saudi Arabia revealed a significant deficit in the comprehension of weight control drugs and supplements among community pharmacists [14]. These findings resonate with research conducted among community pharmacists in Australia, where participants lacked the ability to recognize side effects and drug interactions associated with commonly used weight loss items such as green tea, chromium, and garcinia [15].

Age and gender were significantly associated with awareness scores about Ozempic's side effects in our study (p-values 0.017 and 0.010, respectively). The 21-30 age group exhibited the highest awareness score, and females demonstrated higher awareness compared to males. These findings align with studies in Saudi Arabia where female gender indicated superior awareness regarding anti-obesity medicine [11, 16]. This could be attributed to women's higher obesity prevalence in Saudi Arabia [17]. However, it's

important to note that some Saudi studies didn't identify a substantial link between gender and knowledge of WMMs [12].

Patient education is vital, but healthcare providers must engage in open discussions, considering patient concerns and preferences for obesity treatment options. Shared decision-making encourages patient involvement and adherence to treatment recommendations.

Study Limitation

Our study offers significant contributions by shedding light on the awareness levels among Saudi patients dealing with obesity regarding the potential side effects associated with Ozempic. However, it's vital to acknowledge certain limitations within our research. These include the limited sample size, which might affect the representation of the broader population, as well as potential biases that could have influenced participants' responses. Addressing these limitations, future research endeavors should aim for larger and more diverse samples to ensure the generalizability of our findings to a wider population of patients. Additionally, the absence of prior studies specifically investigating the knowledge and awareness of Ozempic's side effects may affect the comprehensive interpretation of our results, signifying a potential area for further exploration in the field.

Future Implications

The future implications underscore the critical need for patient education regarding the potential risks linked with this medication, aiming to safeguard their well-being and safety. Healthcare professionals bear a pivotal responsibility in imparting comprehensive information to patients, emphasizing the associated risks and benefits of the medication. Equally crucial is the advocacy for healthy lifestyle modifications as an integral part of managing obesity effectively. Encouraging patients to adopt healthier behaviors, including dietary improvements, regular exercise, and lifestyle changes, can significantly complement medication use in achieving optimal health outcomes.

Conclusion

Addressing the knowledge and awareness levels of patients in Saudi Arabia regarding the side effects of Ozempic is a crucial aspect of managing obesity in this population. Our study revealed a critically low overall knowledge score among participants. Through comprehensive education, addressing cultural and language barriers, and engaging in shared decision-making, healthcare providers can significantly enhance patient awareness and understanding. This improvement, in turn, can positively impact the health outcomes of patients with obesity in Saudi Arabia. Furthermore, conducting more studies to evaluate knowledge and awareness levels within the population is recommended. These studies will help assess the actual depth of understanding and enable the development of strategies to enhance awareness regarding the use of Ozempic and other anti-obesity medications.

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