ORIGINAL ARTICLE

Assessment of Public Knowledge, Awareness and Practice about the Use, Adverse Effects, and Safety of Glucagon-like Peptide-1 Agonist Medications in Saudi Arabia

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Abstract

Background: Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) have gained increasing attention for weight management and metabolic diseases. However, public knowledge, awareness, and practice regarding their use, safety, and adverse effects remain insufficiently explored in Saudi Arabia. **Objective:** The objective of the study is to assess the knowledge, awareness, and practice regarding glucagon-like peptide-1 (GLP-1) agonist medications, including their use, adverse effects, and safety among the general population in Saudi Arabia. **Materials and Methods:** A cross-sectional study was conducted among 436 participants in Saudi Arabia. Data were collected using a structured questionnaire covering sociodemographic characteristics, knowledge, and practice regarding GLP-1 medications. Descriptive statistics, Chi-square tests, and multinomial logistic regression were applied. **Results:** The mean age of participants was 36.1 ± 14.9 years. Most of the respondents were female (77.5%), held a bachelor's degree (65.8%), and resided in the Western region (57.1%). Overall, 57.6% had moderate knowledge, 29.1% poor knowledge, and only 13.3% good knowledge. Significant associations were found between knowledge level and both age ($P < 0.001$) and gender ($P = 0.003$), while education was not significant. Multinomial logistic regression confirmed that age was the only significant predictor of knowledge ($P < 0.001$). Regarding practice, 94.5% had never used weight-loss medications. Among users, semaglutide and tirzepatide were the most commonly reported drugs, mainly for obesity and diabetes. Most users reported low engagement with healthcare consultation and limited adverse effects. **Conclusion:** The study shows that the Saudi population has a moderate level of knowledge about GLP-1 RAs, but their usage is very low. Age was the most significant factor influencing knowledge, while practice patterns suggest there is a lack of medical guidance and awareness.

Key words: GLP-1 agonists, public awareness, medication safety, knowledge and practice, Saudi Arabia

INTRODUCTION

Obesity is a prevalent health concern that poses a significant threat to public health globally.[1] The World Health Organization defines obesity as "an excessive accumulation of body fat that may impair health," making it a significant global problem. It is associated with detrimental metabolic

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alterations and long-term conditions such as type 2 diabetes, heart disease, neurological conditions, and certain cancers.[2] According to recent figures, the number of people who are overweight or obese is rising worldwide, with 2 billion people, or 30% of the total population, being overweight.[3]

In the Gulf Cooperation Council countries, one in five persons is considered obese, underscoring the rising prevalence of obesity as major non-communicable diseases.[4] People with a body mass index (BMI) >30 kg/m^2 have almost 50% greater healthcare expenses than people without obesity-related comorbidities, which presents significant financial challenges.[5] In Saudi Arabia, a third of children and adolescents between the ages of 5 and 19 years were considered overweight or obese in 2016,[6] indicating that the issue affects younger populations as well. In addition, Saudi Arabia has a far greater prevalence of obesity (35%) than the global norm (13%), which leads to a higher death rate from obesity (116.7/100,000) than the global average (60/100,000).[7]

Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) are now an anchor drug class in the treatment of type 2 diabetes mellitus (T2DM) and obesity management.[8] By suppressing glucagon release, increasing satiety, and secreting insulin, they enhance glycemic control and significantly reduce body weight.[9] Glucagon-like peptide-1 (GLP-1) has many metabolic effects, such as enhanced natriuresis and diuresis, reduced stomach emptying, suppression of food intake, control of rodent β-cell proliferation, and glucose-dependent stimulation of insulin production.[10] T2DM and obesity are now treated in clinical practice using GLP-1RA.[10,11]

Many GLP-1 RAs, such as liraglutide, dulaglutide, and semaglutide, are utilized for weight management globally due to their proven effectiveness. For instance, 3% of adults in Great Britain said they had used a GLP-1 RA to lose weight in the previous year, and those who were thinking about using one in the future showed a great deal of interest.[12] Semaglutide is the most widely used GLP-1 RA for managing weight both domestically and internationally. The US Food and Drug Administration (FDA) has approved two formulations of semaglutide for the treatment of type 2 diabetes: Oral (Rybelsus) and injectable (Ozempic).[13]

GLP-1 RAs are clinically well understood, but there are still gaps in knowledge and awareness of their indications, side effects, and contraindications.[14] Prior research has identified differences in awareness levels according to media exposure, health care availability, and sociodemographic characteristics.[15] The likelihood of adverse effects, patient trust in healthcare providers, and self-perceived efficacy have all been found to have an impact on patients' adherence to GLP-1 RAs.[16] Therefore, to develop educationally focused treatments and improve treatment outcomes, it is crucial to take into account factors that influence attitudes and understanding regarding such drugs.[17]

The purpose of this study is to determine the general public's awareness and knowledge about the use, adverse effects, and safety of GLP-1 RAs in Saudi Arabia. The particular goals were to determine which information sources were deemed most significant and to look into the factors that influence knowledge gaps. This study offers a number of insights into patient perspectives of GLP-1 RAs by analyzing demographic variables, drug exposure history, and information routes of dissemination. The results will guide public health initiatives meant to raise awareness and encourage wise choices about the use of these medications.

MATERIALS AND METHODS

Study design

This was a cross-sectional study designed to assess awareness of weight loss medication among adults in Saudi Arabia. It is conducted between July and December 2025.

Study setting: Participants, recruitment, and sampling procedure

The individuals who got the questionnaire were used as a sample for recruitment to gather people from all throughout Saudi Arabia.

Sample size

The sample size was calculated using the Raosoft online calculator. In order to attain a 95% confidence level and a 5% margin of error, 384 individuals are required.

Inclusion and exclusion criteria

This study included adult Saudi males and females aged 18 years and older from all regions of Saudi Arabia. Participants were eligible to take part if they were willing to participate and capable of completing the online questionnaire independently. Individuals were excluded from the study if they were under 18 years old, pregnant women, healthcare professionals or students in medical fields, and those who did not complete the questionnaire or refused to participate.

Method for data collection, instrument

Information was collected by using an electronic questionnaire, which was distributed through social media platforms such as Twitter and WhatsApp. Social media was selected as the major dissemination channel due to its widespread reach in Saudi Arabia, allowing for efficient and broad regional coverage. The questionnaire was developed after reviewing relevant studies conducted in Saudi Arabia. The final version of the questionnaire was structured into

four main sections to comprehensively assess the study objectives. The first section focused on demographic information, collecting data on participants' age, gender, educational level, occupation, geographic location, weight, height, frequency of exercise, and the presence of any chronic health conditions. The second section explored participants' awareness and perceptions regarding weight loss medications, including their familiarity with these treatments and their primary sources of information. The third section assessed participants' knowledge about the uses and potential risks of such medications, covering aspects such as indications, safety, side effects, and overall risk awareness. The fourth section targeted participants who had previously used weight loss medications, gathering information about the specific drugs used, reasons for use, duration of treatment, amount of weight lost, how the medication was obtained, and any side effects experienced. The questionnaire was distributed online to ensure broad accessibility and to maintain the confidentiality of responses, thereby promoting honest and unbiased participation.

Scoring system

The participants were evaluated on their knowledge, awareness, and practice of the use, safety, and adverse effects of weight loss drugs using a total of 19 statements. There were 12 statements for practice, 7 statements for knowledge. Questions about demographics were not included in the scoring. Answers that were proper or correct received one point, whereas "I don't know" or incorrect answers received zero points. Dichotomous scales (Yes/No) were used for scoring. The maximum score was 19 and was divided into three levels based on Bloom's original cut-off points: 80.0–100.0%, 60.0–79.0%, and <60.0%. Based on their scores, participants were divided into three groups.

Knowledge and practice scores were categorized into three levels based on percentage ranges to evaluate participants' understanding and behaviors related to weight loss medications. Knowledge scores ranged from 0 to 7 points and were classified as follows: good knowledge (80–100%) was defined as a score between 6 and 7 points; moderate knowledge (60–79%) ranged from 4 to 5 points; and poor knowledge (<60%) was defined as a score below 4 points. Practice scores ranged from 0 to 12 points and were categorized as follows: good practice (80–100%) ranged from 10 to 12 points, moderate practice (60–79%) ranged from 7 to 9 points, and poor practice (<60%) was defined as a score below 7 points.

Pilot test

Twenty people were given the questionnaire and asked to complete it to assess the questionnaire's simplicity and the study's practicality. The pilot study data were omitted from the study's final results.

RESULTS

The collected data were entered and analyzed using the Statistical Package for the Social Sciences software version 26. Descriptive statistics were used to summarize the data, where categorical variables were presented as frequencies and percentages, while continuous variables were expressed as mean ± standard deviation (SD). The Chi-square test was used to assess the association between categorical variables, such as gender and age groups, with knowledge and attitude items related to organ donation. A $P < 0.05$ was considered statistically significant. The reliability of the questionnaire items was assessed using Cronbach's alpha coefficient, which demonstrated a Cronbach's alpha value of 0.789, indicating acceptable to good internal consistency.

The mean age of the study participants was 36.1 years, with a SD of 14.9 years. Their mean weight was 64.69 kg, with a SD of 18.3 kg, and the mean height was 160.37 cm, with a SD of 8.95 cm. Participants' ages ranged from 18 to 79 years. Majority of the participants were women (77.5%), majority of the participants were located in the western region (57.1%), and possessed a bachelor's degree (65.8%). Most of the individuals were married (58.0%) and did not work in the healthcare sector (73.2%). Majority of the participants indicated that they did not have any chronic diseases (77.7%), with hypertension and diabetes being the most frequently reported conditions. In lifestyle, approximately 37.6% of individuals did not engage in exercise, while the rest indicated different amounts of physical activity Table 1.

The findings indicate an overall adequate level of knowledge regarding weight-loss medications among the participants. Most of the respondents (85.32%) correctly recognized that these medications should not be used indiscriminately after consulting a healthcare provider, although a minority (14.68%) believed they can be used by anyone, reflecting a misconception about their appropriate use. Knowledge of specific weight-loss medications was moderate, as 39.22% reported not knowing any, and while some participants correctly identified agents such as tirzepatide, semaglutide, and liraglutide, a proportion incorrectly considered insulin and metformin as weight-loss medications, indicating confusion with anti-diabetic drugs. Similarly, half of the participants (50.69%) were unaware of the appropriate BMI criteria for prescribing these medications, and only 4.13% correctly identified BMI <25 as the suitable range, demonstrating poor understanding of eligibility indications. Knowledge of mechanisms of action was good, with some recognizing appetite reduction (41.28%), reducing insulin resistance (11.01%), and satiety promotion (27.98%), although 19.72% did not know in this regard. Awareness of side effects, the participants showed good knowledge, with nausea and vomiting being the most commonly identified (14.45%), majority (60.78%) selected more than two GLP-1 side effects correctly Table 2.

Table 1: Demographic characteristics of the studied participants (*n*=436)

Variable	Category	*n*	%
Mean age±SD=36.1±14.906 Min=18, Max=79			
Mean weight±SD=64.69±18.303 Min=35, Max=185			
Mean height±SD=160.37±8.953 Min=116, Max=192			
Age groups	From 18 to 21 years	118	27.1
	From 22 to 35 years	102	23.4
	From 36 to 49 years	108	24.8
	50 years and above	108	24.8
Weight groups	Low weight	112	25.69
	Moderate weight	216	49.54
	High weight	108	24.77
Height groups	Short	57	13.07
	Moderate	308	70.64
	Tall	71	16.28
Gender	Female	338	77.5
	Male	98	22.5
Province of residency	Central region	42	9.6
	Eastern region	93	21.3
	Northern region	4	0.9
	Sothern region	48	11
	Western region	249	57.1
Presence of chronic diseases	Cardiovascular disease	3	0.68
	Diabetes	21	4.73
	Hypertension	26	5.86
	Thyroid disorders	16	3.60
	Dyslipidemia	7	1.58
	No, I have no chronic disease	345	77.70
	others	26	5.86
Educational level	Bachelor	287	65.83
	Diploma	22	5.05
	High school	77	17.66
	Middle school	1	0.23
	No educational qualification	1	0.23
	Post-graduates	41	9.40
	Primary school	7	1.61
Marital status	Discovered	11	2.52
	Married	253	58.03
	Single	169	38.76
	Widowed	3	0.69
Do you work in the healthcare field	No	319	73.17
	Yes	117	26.83
How much do you exercise	1–2 times/week	123	28.21
	5–6 times/week	44	10.09
	Daily	42	9.63
	I don't exercise	164	37.61
	Intermittently monthly	25	5.73
	Intermittently weekly	38	8.72

SD: Standard deviation

Table 2: Distribution of the participants' responses regarding knowledge

Question	Response	*n*	%
After consulting a healthcare provider, do you think anyone can use weight-loss medication?	No	372	85.32
	yes	64	14.68
Which of the following medications do you know is used as a weight loss medications?	I don't know	171	39.22
	Tirzepatide (Mounjaro)	62	14.22
	Tirzepatide (Mounjaro), Metformin (Glucophage)	5	1.15
	insulin	12	2.75
	Liraglutide (Saxenda), Tirzepatide (Mounjaro)	3	0.69
	Metformin (Glucophage)	9	2.06
	More than two medicines	86	19.72
	Semaglutide (Ozempic)	20	4.59
	Semaglutide (Ozempic), Liraglutide (Saxenda)	1	0.23
	Semaglutide (Ozempic), Metformin (Glucophage)	7	1.61
	Semaglutide (Ozempic), Tirzepatide (Mounjaro)	60	13.76
According to your information, what is the percentage of BMI that allows the use of this medication in people who have disease-free health?	I don't know	221	50.69
	BMI <25 (less than)	18	4.13
	BMI >40 (more than)	114	26.15
	BMI 26–30	27	6.19
	BMI 31–40	56	12.84
How do you think weight loss medications work?	I don't know	86	19.72
	Promote satiety	122	27.98
	Reduce appetite	180	41.28
	Reduce insulin resistance	48	11.01
Which of the following side effects do you know that is associated with weight loss medications?	Abdominal pain	11	2.52
	Water retention, depressed mood	2	0.46
	Weight gain	1	0.23
	Weight gain, depressed mood	2	0.46
	Depressed mood	48	11.01

(Contd...)

Table 2: (*Continued*)

Question	Response	*n*	%
	Diarrhea	17	3.90
	Headache	15	3.44
	Headache, depressed mood	7	1.61
	Headache, water retention	2	0.46
	More than two options	265	60.78
	Nausea and vomiting	63	14.45
	Water retention	3	0.69
Did you know that weight loss medications can cause pancreatitis, which is an emergency?	No	260	59.63
	Yes	176	40.37
Did you know that weight loss medications can cause thyroid tumor?	No	301	69.04
	Yes	135	30.96

BMI: Body mass index

The results show that the majority of participants had a moderate level of knowledge regarding Vitamin D, as 57.6% (n = 251) fell into this category. Nearly one-third of participants demonstrated poor knowledge (29.1%, n = 127), indicating noticeable gaps in understanding. Only a small proportion of respondents (13.3%, n = 58) had good knowledge. Overall, the findings suggest that while basic knowledge is present among most participants, a relatively low level of comprehensive understanding exists Figure 1 and Table 3.

A statistically significant association was noticed between knowledge level and gender (χ^2 = 11.812, P = 0.003), with females showing higher proportions of moderate knowledge compared to males. In addition, age group was significantly associated with knowledge level (χ^2 = 51.456, P < 0.001), where younger participants (18–21 years) showed higher moderate knowledge, while older participants (≥50 years) had higher proportions of poor knowledge. In contrast, no statistically significant association was found between knowledge level and education levels (χ^2 = 2.309, P = 0.315) [Table 4].

The results of the multinomial logistic regression indicated that age was the only factor that significantly predicted the outcome, with a P < 0.001. Individuals from various age groups were more likely to have better knowledge, with an odds ratio (OR) of 3.819 and a 95% confidence interval of 1.848–7.891. In comparison, the levels of education and gender were not significantly linked to the outcome (P = 0.104 and P = 0.101, respectively), suggesting that these factors did not independently influence variations in the outcome after adjustments were made Table 5.

Table 3: Frequency of the knowledge level

Knowledge level	Frequency	Percentage
Poor	127	29.1
Moderate	251	57.6
Good	58	13.3

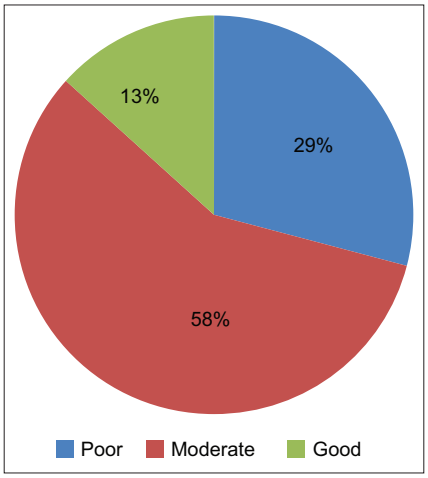

Figure 1: Frequency of knowledge levels

The results indicate that the majority of participants (94.5%) had not used weight loss medications, whereas a small percentage (5.5%) reported having used them. The primary reason for not using these medications was the belief that they are unnecessary (66.5%), followed by concerns about side effects (24.1%). Semaglutide (Ozempic) and tirzepatide (Mounjaro) were the most frequently mentioned medications among users, primarily utilized for obesity and diabetes management. The majority of users acquired the medications from pharmacies and indicated that they used them alongside a diet or exercise. Uncommon side effects primarily involved gastrointestinal issues, and none of the participants reported looking for medical information or consulting healthcare professionals Table 6.

The results show that practice was fairly evenly spread among the three categories. Moderate practice was slightly higher at 33.5%, while both poor and good practice were equal at 33.2% each. This indicates that the study population is relatively evenly distributed across Figure 2 and Table 7.

DISCUSSION

One of the main causes of death worldwide is obesity. Globally, especially in Saudi Arabia, the prevalence of obesity has risen significantly over the last 30 years.[18] Overweight and obesity among people in Saudi Arabia and

Table 4: Correlation between demographic characteristics and knowledge levels (low level included primary, secondary, diploma, middle, and no education, while high included bachelor and postgraduate)

Variable	Category	Poor *n* (%)	Moderate *n* (%)	Good *n* (%)	χ^{22}	df	*P*-value
Gender	Male	42 (42.9)	44 (44.9)	12 (12.2)	11.812	2	0.003*
	Female	85 (25.1)	207 (61.2)	46 (13.6)			
Age group	18–21 years	17 (14.4)	92 (78.0)	9 (7.6)	51.456	6	<0.001*
	22–35 years	27 (26.5)	50 (49.0)	25 (24.5)			
	36–49 years	36 (33.3)	52 (48.1)	20 (18.5)			
	≥50 years	47 (43.5)	57 (52.8)	4 (3.7)			
Education level	Low	35 (32.4)	63 (58.3)	10 (9.3)	2.309	2	0.315
	High	92 (28.0)	188 (57.3)	48 (14.6)			

**P*-value was considered significant if ≤0.05

Table 5: Multinomial logistic regression analysis of predictors of knowledge levels regarding education, age groups, and gender

Variable	B	SE	Wald	OR (ExpB)	95% CI	*P*-value
Education	−0.443	0.272	2.650	0.642	0.376–1.095	0.104
Age groups	1.340	0.370	13.093	3.819	1.848–7.891	<0.001*
Gender	−0.473	0.288	2.687	0.623	0.354–1.097	0.101

SE: Standard error, OR: Odds ratio, CI: Confidence interval, **P*-value was considered significant if ≤0.05

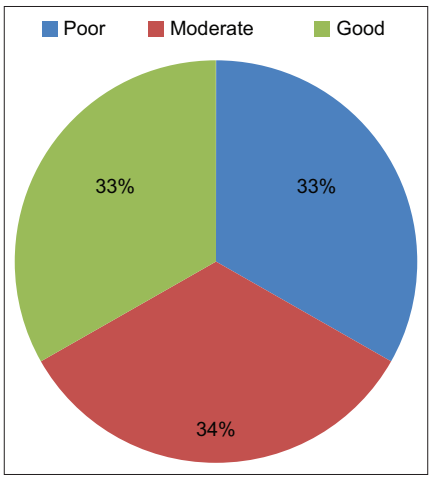

Figure 2: Frequency of the practice level

other Gulf Cooperation Council nations have significantly increased over the past 40 years, according to a recent comprehensive study, with risk factors including sedentary lifestyles, poor diets, and sociodemographic characteristics.[7] By 2040, there will be 2.26 million new cases of T2DM, liver disease, and liver cancer in Saudi Arabia due to the country's rising obesity incidence.[19] This underscores the importance of focused strategies aimed at prevention and treatment.[20,21]

Despite the fact that GLP-1 RAs have shown significant efficacy in the treatment of obesity and diabetes, it is important to understand that using them carries some inherent hazards that should not be ignored. Our study was designed to assess the level of awareness of the Saudi Arabian population regarding the use, safety, and adverse effects of weight loss drugs.

This study included 436 participants. The mean age of the studied individuals was 36.1 years. Their mean weight was 64.69 kg, and the mean height was 160.37 cm. The majority of participants were women (77.5%). Most of the responders were located in the western region (57.1%), and possessed a bachelor's degree (65.8%). Majority was married (58.0%) and did not work in the healthcare sector (73.2%). A statistically significant association was noticed between knowledge level and gender ($\chi^2 = 11.812$, $P = 0.003$), with females showing higher knowledge compared to males. One of the variables influencing knowledge and attitude scores was female gender ($P < 0.001$). These findings corroborate earlier research by Tsai *et al*., which found that males were less likely than women to perceive weight loss (OR = 0.36) and seek weight loss (OR = 0.39).[22]

The majority of participants had an overall moderate level of knowledge (57.6%) and awareness regarding weight-loss medications among the participants. Most respondents (85.32%) correctly recognized that these medications should not be used indiscriminately after consulting a healthcare provider, although a minority (14.68%) believed they can be used by anyone, reflecting a misconception about their appropriate use. The results indicated that the majority of participants (94.5%) had not used weight loss medications. Semaglutide (Ozempic) and tirzepatide (Mounjaro) were the most frequently mentioned medications among users, primarily utilized for obesity and diabetes management. In

Table 6: Distribution of the participants' responses regarding practice

Question	Response	*n*	%
Have you ever used weight loss medication?	No	412	94.5
	Yes	24	5.5
[If no] What is the reason for not using weight loss medication?	Fear of the Side effects	105	24.1
	I don't need it	290	66.5
	Other	31	7.1
	The high cost	6	1.4
	The Need for a prescription	4	0.9
Which of the following medications are you using?	Tirzepatide (Mounjaro)	2	0.46
	Semaglutide (Ozempic)	3	0.69
	Other	1	0.23
What's the reason for the use of the previously mentioned medications?	Obesity	3	0.69
	Diabetes	1	0.23
	Other	2	0.46
What's the source of the medication?	Pharmacy	4	9.2
	Relatives and friends	1	0.23
	Other	1	0.23
Did you consult a healthcare provider before administering the medication?	No	6	1.38
What's your way of using weight loss medication?	Only using the medication	1	0.23
	Medication+ Change in diet	2	0.46
	Medication+Exercise	2	0.46
What was the rate of weight loss after using the medication?	<5 kg	4	0.9
	5–10 kg	2	0.46
Have you experienced any side effects when using these medications?	Yes	4	0.9
	No	2	0.46
What side effects did you experience?	Nausea/vomiting	4	0.9
	Abdominal pain	2	0.46
	Dizziness/headache	3	0.69
After stopping the medication, did you notice any weight gain?	Yes	4	0.9
	No	2	0.46
Did you read or search for medical information about the medications you used for weight loss?	Yes	5	1.15
	No	1	0.23

Table 7: Frequency of the practice level

Practice level	Frequency	Percentage
Poor	145	33.2
Moderate	146	33.5
Good	145	33.2

agreement with us, a study in Jeddah found a relatively high awareness of the limitations and requirements for antiobesity medications (AOM) usage.[23]

The study's findings contradict past research showing a lack of public knowledge of AOMs. For example, Elrggal *et al*. discovered that, except orlistat, more than half of community pharmacists lacked sufficient knowledge about the adverse effects of weight management drugs.[24] Similarly, in the Algarni *et al*.'s study,[25] only 31% of the participants (712 people) classified AOMs as weight control therapy. This ignorance among medical professionals could have a detrimental effect on public education and the use of AOM, highlighting the need for better resources and training.

However, there is more research on the awareness and use of anti-obesity medications by medical professionals. Al-Shammari presented proof of the underprescription of anti-obesity medications in Eastern Saudi Arabia in 2014. 72.3% of doctors in this cross-sectional study reported never using weight-loss drugs to treat obesity. Moreover, weight management medications (WMMs) were underutilized even when necessary.[26]. Only 10% of practitioners were aware of the indications for administering WMMs, according to Al-Khaldi *et al*.[27] According to additional data, doctors were informed in 2020 that anti-obesity drugs were not available in primary care.[28]

It is to be noticed that half of the participants (50.69%) were unaware of the appropriate BMI criteria for prescribing these medications, and only 4.13% correctly identified BMI <25 as the suitable range, demonstrating poor understanding of eligibility indications. In contrast to us, a study in Madinah city, Saudi Arabia, found that most of the participants correctly identified that these medications are not suitable for everyone and recognized BMI as a key factor in determining eligibility. A significant percentage accurately identified BMI ≥30 as the cutoff point for pharmacologic intervention, which is in line with clinical recommendations.[29]

Knowledge of mechanisms of action was good, with some recognizing appetite reduction (41.28%), reducing insulin resistance (11.01%), and satiety promotion (27.98%). Regarding awareness of side effects, the participants showed good knowledge, with nausea and vomiting being the most commonly identified (14.45%) side effects. The list of side effects matched those documented in clinical trials. Loss of appetite (69.3%), vomiting (49.2%), and abdominal pain (47.2%) were the most common side symptoms reported in a study done in Saudi Arabia.[17] All of these gastrointestinal

side effects are frequent and are thought by many to be the main factor influencing patient adherence to the treatment.[30]

The majority of users in the present study acquired the medications from pharmacies and indicated that they used them alongside a diet or exercise. A cross-sectional research of 716 members of Saudi Arabia's general population found that participants had a strong understanding of exercise (621, 86.7%) and diet (565, 78.9%). However, there was a lack of awareness (222, 31%) and a wary attitude regarding AOMs because the majority of participants thought exercise and diet were more convenient, safe, and effective.[25]

Limitations

1. The cross-sectional design limits the ability to establish causal relationships between demographic factors and knowledge or practice levels
2. The use of self-reported data may introduce recall and response bias, potentially affecting the accuracy of participants' responses
3. The sample consisted mainly of females and individuals with a high level of education, which may restrict the applicability of the results to be generalized in the Saudi population
4. The limited number of GLP-1 users hindered a more thorough examination of usage patterns and side effects
5. Data were gathered using an online questionnaire, which might leave out people who have restricted access to digital technology or low health literacy.

CONCLUSION

The results of this study indicate that the general population in Saudi Arabia has a moderate understanding of GLP-1 RAs medications, with many participants lacking knowledge in important areas such as eligibility criteria and suitable uses. Age was found to be the only significant factor influencing knowledge, with younger people showing greater awareness than older individuals. Although the global use of GLP-1 medications is rising, the actual usage among participants was quite low, and most users indicated minimal engagement with healthcare professionals.

ACKNOWLEDGMENTS

We would like to acknowledge all volunteers who provided samples for this research.

ETHICAL APPROVAL

The study was fully explained to all participants, and it was emphasized that participation was voluntary. Written informed consent was obtained from each participant before enrollment. All collected information was securely stored and used exclusively for research purposes.

INFORMED CONSENT

Written informed consent was obtained from all study participants.

DATA AND MATERIALS AVAILABILITY

All data generated or analyzed during this study are included in this published article.

REFERENCES

1. Alrubaiee GG, Alqalah TA, Alkubati SA, Al-Rabeei NA. Overweight and obesity among Saudi university students and their relationships with various lifestyle habits: A cross-sectional study. BMC Public Health 2025;25:2021.
2. Guo H, Yang J, Huang J, Xu L, Lv Y, Wang Y, *et al*. Comparative efficacy and safety of GLP-1 receptor agonists for weight reduction: A model-based meta-analysis of placebo-controlled trials. Obes Pillars 2025;13:100162.
3. Afshin A, Reitsma MB, Murray CJ. Health effects of overweight and obesity in 195 countries. N Engl J Med 2017;377:1496-7.
4. Oguoma VM, Coffee NT, Alsharrah S, Abu-Farha M, Al-Refaei FH, Al-Mulla F, *et al*. Prevalence of overweight and obesity, and associations with socio-demographic factors in Kuwait. BMC Public Health 2021;21:667.
5. Althumiri NA, Bindhim NF, Al-Rayes SA, Alumran A. Mapping obesity trends in Saudi Arabia: A four-year description study. Healthcare 2024;12:2092.
6. Alghaith T. Overweight and Obesity in Saudi Arabia: Consequences and Solutions. Washington, DC: World Bank Publications; 2022.
7. Salem V, AlHusseini N, Abdul Razack HI, Naoum A, Sims OT, Alqahtani SA. Prevalence, risk factors, and interventions for obesity in Saudi Arabia: A systematic review. Obes Rev 2022;23:e13448.
8. Je IG, Rang IM, Lee DG, Choi WG, Jang E, Park JS,N *et al*. 93-LB: Discovery of ID110521156, a small molecule GLP-1 receptor agonist, for the treatment of type 2 diabetes and obesity. Diabetes 2023;72 Suppl 1:93-LB.
9. Nachawi N, Rao PP, Makin V. The role of GLP-1 receptor agonists in managing type 2 diabetes. Cleve Clin J Med 2022;89:457-64.
10. Almohareb SN, Alfayez OM, Aljuaid SS, Alshahrani WA, Bakhsh G, Alshammari MK, *et al*. Effectiveness and safety of GLP-1 receptor agonists in patients with type 1

diabetes. J Clin Med 2024;13:6532.
11. Drucker DJ. GLP-1 physiology informs the pharmacotherapy of obesity. Mol Metab 2022;57:101351.
12. Jackson SE, Brown J, Llewellyn C, Mytton O, Shahab L. Prevalence of use and interest in using glucagon-like peptide-1 receptor agonists for weight loss: A population study in Great Britain. BMC Med 2026;24:1.
13. Alhussain K, Alshakhs Z, Albaqshi L, Alshaqaqiq F, Alrabiah M, Tripathi R. Prevalence and factors associated with GLP-1 receptor agonist use for weight management among overweight and obese adults in the Eastern province of Saudi Arabia. Healthcare (Basel) 2026;14:345.
14. Brechtelsbauer EL, Black RL, Wysham CH. PSUN326 an interim analysis of healthcare professionals' gaps in incretin knowledge before and after education. J Endocr Soc 2022;6:A412.
15. Azizi Z, Rodriguez F, Assimes TL. Digital footprints of obesity treatment: GLP-1 receptor agonists and the health equity divide. Circulation 2024;150:171-3.
16. Davies MJ, D'Alessio DA, Fradkin J, Kernan WN, Mathieu C, Mingrone G, *et al*. Management of hyperglycemia in type 2 diabetes, 2018. A consensus report by the American diabetes association (ADA) and the European association for the study of diabetes (EASD). Diabetes Care 2018;41:2669-701.
17. Abualhommos AK, Al Hawaj MA, Alrasheed SY, Alessa RA, Alhussain AY, Alabdulkareem RA, *et al*. Assessment of community awareness and attitude about the use of GLP 1 agonists as a treatment for obesity in Saudi Arabia: Cross-sectional study. Medicine (Baltimore) 2026;105:e46957.
18. Safaei M, Sundararajan EA, Driss M, Boulila W, Shapi'i A. A systematic literature review on obesity: Understanding the causes and consequences of obesity and reviewing various machine learning approaches used to predict obesity. Comput Biol Med 2021;136:104754.
19. Coker T, Saxton J, Retat L, Alswat K, Alghnam S, Al-Raddadi RM, *et al*. A. The future health and economic burden of obesity-attributable type 2 diabetes and liver disease among the working-age population in Saudi Arabia. PloS One 2022;17:e0271108.
20. Novograd J, Mullally JA, Frishman WH. Tirzepatide for weight loss: Can medical therapy "outweigh" bariatric surgery? Cardiol Rev 2023;31:278-83.
21. AlOtaibi HF, Alnasrallah S, Alfadda AA, AlquassayerSA, Arafat AA, AlMuhaidib S, *et al*. Saudi healthcare providers' perspectives and clinical practice of anti-obesity medications: A national survey. Saudi J Med Med Sci 2025;13:222-30.
22. Tsai SA, Lv N, Xiao L, Ma J. Gender differences in weight-related attitudes and behaviors among overweight and obese adults in the United States. Am J Mens Health 2016;10:389-98.
23. Khalaf RM, Alghamdi HA. Knowledge and perception of anti-obesity medications among primary healthcare center visitors in Jeddah, Saudi Arabia in 2024: An analytical cross-sectional study. Cureus 2024;16:e68240.
24. Elrggal ME, Alamer SI, Alkahtani SA, Alshrahili MA, Alharbi A, Alghamdi BA, *et al*. Dispensing practices for weight management products in eastern Saudi Arabia: A survey of community pharmacists. Int J Environ Res Public Health 2021;18:13146.
25. Algarni MA, Algarni AA, Alqarni WA, Alqassim AY. Knowledge and attitude of the general population in Saudi Arabia toward weight management medications (WMMs): A cross-sectional study. Cureus 2023;15:e42875.
26. Alshammari YF. Attitudes and practices of primary care physicians in the management of overweight and obesity in Eastern Saudi Arabia. Int J Health Sci 2014;8:151-8.
27. Al-Khaldi YM, Melha WS, Al-Shahrani AM, Al-Saleem SA, Hamam MA. Knowledge, attitude and practice of primary health care physicians in Aseer region regarding obesity. Saudi J Obes 2014;2: 54-8.
28. Al Noor MA, Horaib YF, Almusallam NA, Alyousef AY, Alkahmous FS, Alyousef AY. Physicians' knowledge, feelings, attitudes, and practices toward obesity at family medicine setting in Riyadh, Saudi Arabia. Int J Med Dev Ctries 2020;4:130-6.
29. Zalat MM, Alahmadi HG, Aljuhani MA, Alahmadi TN. Assessment of awareness toward glucagon-like peptide-1 anti-diabetic medication in Madinah City, Saudi Arabia: A cross-sectional study. Saudi J Med Pharm Sci 2025;11:534-9.
30. Liu L, Chen J, Wang L, Chen C, Chen L. Association between different GLP-1 receptor agonists and gastrointestinal adverse reactions: A real-world disproportionality study based on FDA adverse event reporting system database. Front Endocrinol (Lausanne) 2022;13:1043789.

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