CAHIERS MAGELLANES-NS
Volume 07 Issue 1
2025

ISSN:1624-1940
http://magellanes.com/

KNOWLEDGE, ATTITUDE, AND PRACTICES ON THE USES OF ANTIDIABETICS FOR WEIGHT LOSS PURPOSES AMONG SAUDI POPULATION

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Abstract

Background: Obesity is a significant health concern globally, especially in Saudi Arabia, where obesity rates have risen dramatically. Obesity and being overweight are linked to various illnesses, including cardiovascular diseases and diabetes mellitus. Recently, there has been growing interest in the off-label use of antidiabetic medications for weight loss. These medications, such as Ozempic® and Saxenda®, have shown potential for aiding weight management, but their use among non-diabetic individuals raises concerns about safety and efficacy. **Objectives:** This study aims to assess the awareness, perceptions, and behaviors of Saudi nationals concerning the use of antidiabetic medications for weight management. **Methodology:** A cross-sectional questionnaire-based study conducted from July to December 2024. Adult male and female Saudi nationals recruited using an electronic questionnaire distributed via social media. The sample size determined to be 385 participants, calculated with a confidence level of 95% and a margin of error of 5%. Inclusion criteria is adult obese patients aged 18 and above, while non-obese individuals, minors, and non-residents excluded. Data collected through a self-administered electronic questionnaire comprising sections on demographics, knowledge, attitudes, and practices.

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Descriptive statistics and categorical analysis performed using SPSS version 24.0. **Results:** A total of 518 participants, predominantly young adults with a mean age of 32.5 years. Findings revealed that while 57.5% recognized Ozempic® as effective for weight loss, a significant 30.7% were unaware of any antidiabetic medications. Although 67.5% agreed on the necessity of medical supervision for such medication use, skepticism persisted, with 44.9% doubting their effectiveness. Furthermore, 87.3% reported not using weight loss medications in the past year, relying instead on diet and exercise, highlighting a substantial knowledge gap critical for enhancing patient education and health outcomes. **Conclusion:** This study highlights the need for enhanced education, improved healthcare provider-patient communication, and the implementation of robust regulatory frameworks to ensure the safe and appropriate use of antidiabetic medications for weight loss purposes among the Saudi population.

Keywords: Obesity, Antidiabetic Medications, Weight Loss, Saudi Arabia, Knowledge, Attitudes, Practices, Cross-Sectional Study

Introduction:

Obesity in Saudi Arabia is a multifaceted problem shaped by factors including sedentary habits, dietary shifts, cultural practices, gender differences, climate, and the recent effects of COVID-19 [1]. A body mass index (BMI) higher than 30 kg/m2 is considered obese, according to the World Health Organization (WHO) [2]. Obesity has multiple health risks such as dyslipidemia, hypertension, and even cardiovascular disorders [3].

Obesity is on the rise worldwide, according to the World Health Organization (WHO), with the highest obesity rates found in the Arabian Gulf (AG) countries of Kuwait, Saudi Arabia (SA), the United Arab Emirates (UAE), and Bahrain. Saudi Arabia is second in terms of obesity rates. Obesity has been more prevalent in Saudi Arabia among men and women of all ages in recent years [4].

In 2023, research published on Jordanian Population Knowledge, Attitude, and Practices on the Uses of Antidiabetics for Weight Loss Purposes revealed that 57% of Jordanians believe antidiabetic medications can help with weight loss, 12.3% have used them for this purpose [5]. Another study conducted in 2023, titled "Knowledge and Attitude of the General Population in Saudi Arabia Toward Weight Management Medications (WMMs): A Cross-Sectional Study" by Malak A. Algarni et al. found that 31% of participants recognized pharmaceutical medications for weight management, with 33% and 31.8% aware of semaglutide and liraglutide, respectively. Significant predictors of knowledge included age, income, education, psychiatric history, and prior use. Attitudes were generally cautious, with 57.7% believing WMMs are less effective than diet and exercise, 56.6% considering them unsafe, and 74.6% agreeing that WMMs require specialist counseling [6]. A similar study "Knowledge, Attitude, and Practice Level of Using Diabetes Medication to Lose Weight for Non-Diabetic Patients among the Population in Saudi Arabia" indicated that 38.3% of participants had good knowledge about using diabetes medications for weight loss, 32.5% had poor knowledge, and 29.3% had moderate knowledge. Attitudes toward these medications were cautious, with 60% of participants believing they should not

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be used without a doctor's prescription and 63.3% uncertain about the risk of dependency [7].

There is not enough information about our research and due to the small sample size associated with our topic, we decided to conduct this research. Therefore, this study aimed to assess Knowledge, Attitudes, and Practices on the Uses of Antidiabetics for Weight Loss Purposes among the Saudi population.

Methodology:

Study design and setting:

This cross-sectional questionnaire-based study conducted from July to December 2024 in Saudi Arabia to evaluate the knowledge, attitudes, and practices of the Saudi population regarding the use of antidiabetics for weight loss purposes. The study population is adult male and female Saudi nationals. Participants recruited using an electronic questionnaire distributed via various social media platforms. The recruitment process targeted a diverse group of individuals to ensure a representative sample.

Sample size:

The sample size is determined using the Raosoft calculator with a confidence level of 95% and a maximum acceptable margin of error of 5%. The minimum required sample size was 385 participants [8].

Inclusion and Exclusion criteria:

Inclusion Criteria: Adult obese patients (only Saudi nationals) aged 18 years and above. Exclusion Criteria: Individuals under the age of 18, non-obese individuals, and non-residents of Saudi Arabia.

Method for data collection, instrument, and score system:

Data collected using a self-administered electronic questionnaire developed using Google Forms after a thorough literature review [5,6,9]. The questionnaire consists of four main sections:

Demographic Data: This section collect participants' age, gender, marital status, weight, height, education, and family monthly income, place of residence, health insurance status, and presence of chronic diseases.

Knowledge of Antidiabetic Medications: This section includes three main questions evaluating participants' knowledge about the use of antidiabetic medications (e.g., Ozempic®, Saxenda®, Mounjaro®, Glucophage®, Insulin, Amaryl®, Jardiance®) for weight loss. Participants were asked about the regulatory approval for this indication, possible side effects, and their sources of information

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(e.g., healthcare providers, nutritionists, social media, scientific articles, family, and friends).

Societal Awareness and Attitudes: This section assess participants' awareness and attitudes towards using antidiabetic medications for weight loss using a five-point Likert scale (ranging from strongly agree to strongly disagree). Questions focused on the level of regulatory supervision, medical supervision, the effectiveness and safety of these medications, and their impact on lifestyle.

Practices in Using Antidiabetic Medications: This section is for participants who had used antidiabetic medications for weight loss. It includes questions on the specific medications used (e.g., Ozempic®, Saxenda®, Mounjaro®, Glucophage®), other weight loss practices (diet, herbal preparations, exercise), sources of the medications, difficulty in obtaining them, weight loss achieved, method of verifying medication sources, doctor consultations, weight gain after cessation, adverse events, and reading medical information prior to use. Participants could also share additional information about their experiences.

Scoring system:

The knowledge data: the correct answer given 1 point and the wrong answer given 0. All answers in the knowledge questions are correct, and they are 20 answers, so the knowledge scale range from a maximum of 20 to a minimum of zero. The score according to the mean and standard deviation (SD) of the results. So, the score < 10 were considered unconfident, 10–14.9 as neutral, 15–20 as confident about the antidiabetic medications use for weight reduction (5)

The attitude data: the answer assessed using Likert scale with a maximum of 5 to a minimum of 1 where (5 for strongly agree, 4 for agree, 3 for neutral, 2 for disagree, and 1 for strongly disagree). The score according to the mean of the results. The score categorized using Bloom's cut-off points: if the mean < 20 (< 59%) were considered negative attitude, 20 - 27.9 (60.0–79.0%) as neutral and 28 – 35 (80.0-100.0%) as a positive attitude toward weight reduction medication [5,10].

Pilot test:

The questionnaire distributed to 20 individuals to assess its simplicity and the feasibility of the study. The data which collected from this pilot study not include in the final analysis.

Analyzes and entry method:

Data collected through Google Forms exported to Microsoft Excel® and then entered into SPSS version 24.0 for statistical analysis. Descriptive statistics (mean, standard deviation) used for continuous variables, while frequencies and percentages used for categorical variables.

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Results:

Table (1) displays various demographic parameters of the participants with a total number of (518). The mean age of all participants is approximately 32.5 years, a very young demographic and with nearly 8% under 30 years of age. There is a certain balance in the gender distribution between males (53.5%) and females (46.5%) of the sample. Marital status, half the respondents are single, an important finding since it may imply the role for marriage as a social support system and as a determinate of health seeking behavior. Height and weight data show variation in body metrics with a high number of participants being overweight or obese. Respondents of which 42.1 percent hail from the Central region show possible trends of regional healthcare accessibility. Family monthly income is highlighted especially by 30.7 percent whose income varies between 7,000-14,999 Saudi riyal, which also puts the major share of the population close to the lower-middle income bracket. A full 60% of participants aren't insured, and over a third admit to having chronic diseases, primarily diabetes and obesity.

Table (1): Sociodemographic characteristics of participants (n=518)

Parameter		***No.***	***Percent (%)***
Age (Mean:32.5, STD:12.4)	Less than 23	149	28.8
	23 to 30	151	29.2
	31 to 45	108	20.8
	More than 45	110	21.2
Gender	Female	241	46.5
	Male	277	53.5
Marital status	Single	262	50.6
	Married	246	47.5
	Divorced	8	1.5
	Widowed	2	.4
Height (Mean:166.2, STD:10.1)	160 cm or less	170	32.8
	161 to 170 cm	181	34.9
	More than 170 cm	167	32.2
Weight (Mean:75.3, STD:20.5)	65 kg or less	175	33.8
	66 to 85 kg	199	38.4
	More than 85 kg	144	27.8
Residential region	Northern region	23	4.4
	Southern region	67	12.9
	Central region	218	42.1
	Eastern region	82	15.8
	Western region	128	24.7
Family monthly income	Less than 7,000 Saudi riyals	115	22.2
	7000-14999 Saudi riyals	159	30.7

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	15,000-19,999 Saudi riyals	138	26.6
	More than 20,000 Saudi riyals	106	20.5
Highest level of education completed	Primary	3	.6
	Intermediate	3	.6
	High School	136	26.3
	Diploma	51	9.8
	Bachelor	274	52.9
	Higher studies	51	9.8
Do you work in a health-related job?	No	402	77.6
	Yes	116	22.4
Health insurance status	Insured	209	40.3
	Uninsured	309	59.7
Do you suffer from chronic diseases?	No	338	65.3
	Yes	180	34.7
If yes, what are these diseases? * (n=180)	Diabetes	61	33.9
	Hypertension	42	23.3
	Cardiovascular disease	9	5.0
	Thyroid diseases	25	13.9
	Hyperlipidemia	37	20.6
	Obesity	58	32.2
	Others	73	40.6

Results may overlap

As shown in figure 1, Analysis of data gathered regarding supervising (level of) authority on the dispensing of antidiabetic medication for weight loss purposes among the entire sample aggregate (n = 518). A strong 19.5% (101 people) agree strongly to the theory of adequate regulation; automatically adding with 29.3% (152 people) agreeing to a total of 48.8% of respondents acknowledging some form of regulation. On the contrary, 13.9 percent (72) of participants disagree, and 4.1 percent (21) strongly disagree, indicating a component of disbelief as to the extent of supervision that is necessary. Most importantly, a striking 33.2% (172 persons) are neutral, that is, ambivalent or uncertain about the efficacy of supervising measures in such an important sphere of public health.

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Figure (1): Illustrates authorities' supervision on dispensing antidiabetic medications for weight loss among participants.

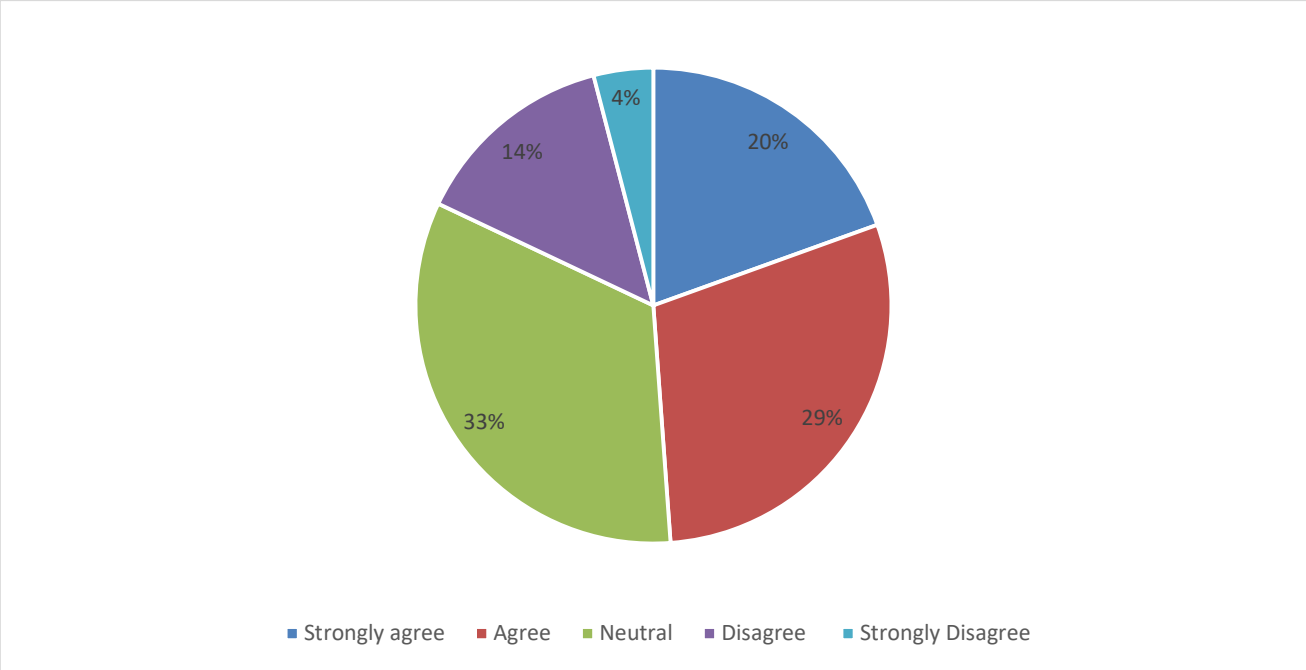

Table 2 presents the data interesting to reveal the understanding of antidiabetic drugs and their effectiveness for the weight loss of society sample of 518 respondents. Ozempic® stands out as the most identified medication in regard to weight loss, with 57.5% of respondents believing Ozempic® to be effective in this regard. Significant recognition was also given for Mounjaro® with 52.9% of participants saying it is a potential adjunct to weight reduction. Yet a great knowledge gap persists, with 30.7 percent of respondents not knowing that any such medications exist. The success rate of Ozempic® (50.8%) and Mounjaro® (45.8%) in terms of regulatory approval only described half of the volunteers, which reveals the need for better education about their therapeutic class. Furthermore, patients mentioned that 75.3% recognized side effects associated with injectable medications which indicate an excellent level of awareness of the complex consideration's patients need to deal with when making a decision regarding a treatment option for weight management as well as diabetes.

Table (2): Parameters related to knowledge of the uses of antidiabetics for weight loss purposes (n=518).

Parameter		***No.***	***Percent (%)***
To the best of your knowledge, which of the following medications can be used to lose	(Ozempic®)	298	57.5
	(Saxenda®)	136	26.3

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weight? *	(Mounjaro®)	274	52.9
	(Glucophage®) Insulin	94	18.1
	(Amaryl®)	4	0.7
	(Jardiance®)	12	2.3
	I don't know	159	30.7
Which of the following medications is approved to be used for weight loss by regulatory authorities such as the Food and Drug Administration? *	(Ozempic®)	263	50.8
	(Saxenda®)	116	22.4
	(Mounjaro®)	237	45.8
	(Glucophage®) Insulin	78	15.1
	(Amaryl®)	4	0.8
	(Jardiance®)	8	1.5
	I don't know	185	35.7
To the best of your knowledge, what are the side effects of the injectable medications used for weight loss? *	Nausea and vomiting	390	75.3
	Diarrhea	211	40.7
	Abdominal pain	231	44.6
	Headache	213	41.1
	Fatigue	254	49.0
	Weight gain	20	3.9
	Skin swelling or irritation where the needle was inserted	105	20.3
	Dark patches of skin	44	8.5
	Unwanted sexual responses (sexual dysfunction or arousal)	24	4.6
	Depression	178	34.4
	Pancreatitis	61	11.8
	Tumors such as thyroid tumors	61	11.8
	Urinary tract infection	22	4.2

Results may overlap

As shown in figure (2), In my opinion, the data presented points to a huge concurrence among participants that medication for weight loss under medical supervision is the way to go. A large portion of the strong agreement, 61%, or 197 respondents, and the agreement, 43%, or 222 respondents came out of a total sample size of 518 individuals. That reflects a cumulative 81% of participants supporting the supervision of medical professional in weight loss medication. In contrast, only 13% (66 respondents) were neutral, while 6% (27 respondents) disagreed and even a smaller 1% (6 respondents) strongly disagreed.

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Figure (2): Illustrates if antidiabetic medications can be used for weight loss under medical supervision among participants.

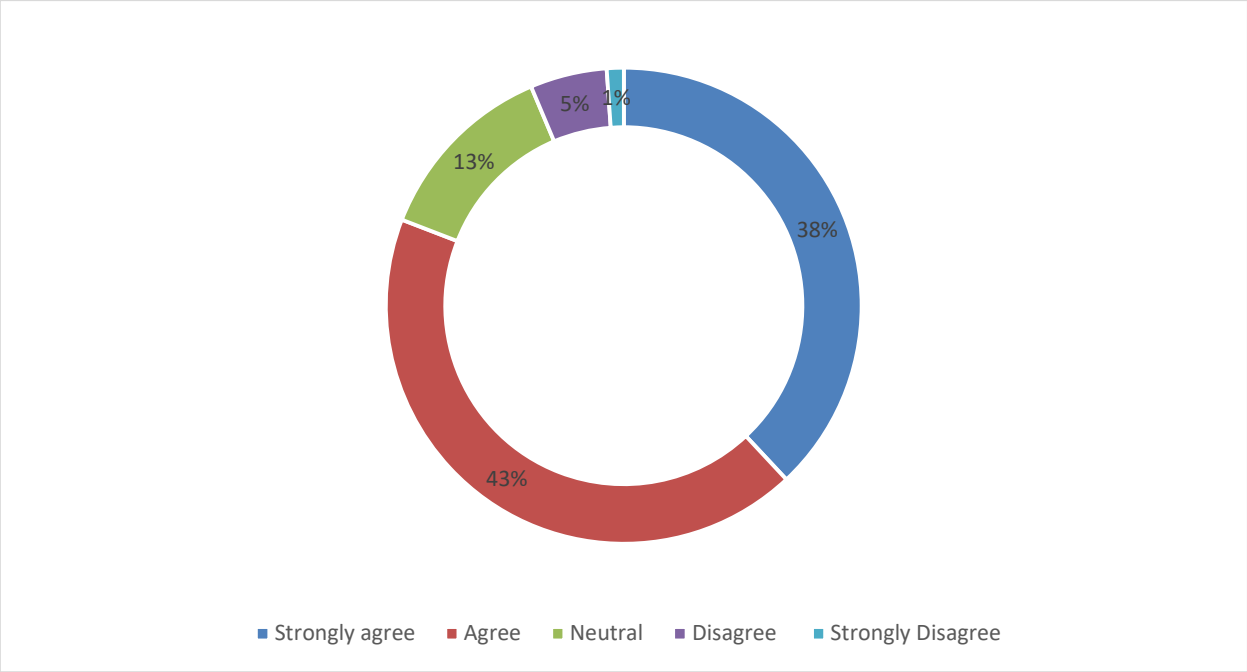

Table 3 contains the data presented that illustrates the attitudes of participants relating to the use of antidiabetic medications for weight loss, from a sample of 518 participants. It is also important to note that a large 67.5% of respondents either agree or strongly agree that such medications should only be used with medical supervision for weight loss. However, there is a high degree of skepticism in the effectiveness and safety of these formulations with 44.9% rejecting the status 'first and best choice' for weight loss and 39.9% that they can never guarantee. More importantly, a large 39.2% are still undecided on whether these medications are long term effective, suggesting pervasive ambivalence.

Table (3): Participants' attitude toward antidiabetic medications uses for weight reduction (n=518).

Parameter		***No.***	***Percent (%)***
There is sufficient supervision by the concerned authorities on the dispensing of antidiabetic medications used for weight loss purposes	Strongly agree	101	19.5
	Agree	152	29.3
	Neutral	172	33.2
	Disagree	72	13.9
	Strongly Disagree	21	4.1
These medications can be used for weight loss, but under medical supervision	Strongly agree	197	38.0
	Agree	222	42.9
	Neutral	66	12.7

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	Disagree	27	5.2
	Strongly Disagree	6	1.2
The use of these medications is the first and best option for weight loss	Strongly agree	51	9.8
	Agree	59	11.4
	Neutral	142	27.4
	Disagree	163	31.5
	Strongly Disagree	103	19.9
These medications help you make the lifestyle changes you need to lose weight and improve your health	Strongly agree	76	14.7
	Agree	159	30.7
	Neutral	188	36.3
	Disagree	73	14.1
	Strongly Disagree	22	4.2
These medications are considered safe and can be used without complications	Strongly agree	38	7.3
	Agree	88	17.0
	Neutral	185	35.7
	Disagree	142	27.4
	Strongly Disagree	65	12.5
The effectiveness of these medications for weight loss is guaranteed	Strongly agree	51	9.8
	Agree	138	26.6
	Neutral	204	39.4
	Disagree	98	18.9
	Strongly Disagree	27	5.2
The efficacy of these medications is long-lasting	Strongly agree	35	6.8
	Agree	79	15.3
	Neutral	225	43.4
	Disagree	139	26.8
	Strongly Disagree	40	7.7

Table 4 provides a complete summary of participant practices in use of antidiabetic medications for weight loss of sample size 518. Nearly 87.3 percent answered that they did not use any medication for weight loss in the past year, and only 81.7 percent of respondents reported mostly using dietary changes (81.7 percent) and exercise (67.2 percent) for weight loss, with a much smaller amount citing other methods. Nineteen percent of the medications reported by those who have used medications for weight loss included Ozempic® (9.8%). This is noteworthy since only 64.2% of respondents affirmed the consultation of the source of these medications before the purchase. Moreover, the data shows that users are heavily dependent on healthcare consultations: 56.4 per cent had already consulted a physician before starting medication.

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Table (4): Participants' practice toward antidiabetic medications used for weight reduction (n=518).

Parameter		***No.***	***Percent (%)***
Have you used any medication for weight loss purposes in the last 12 months?	No	452	87.3
	Yes	66	12.7
Which of the following antidiabetic medications have you used for weight loss purposes? *	(Ozempic®)	51	9.8
	(Saxenda®)	16	3.1
	(Mounjaro®)	33	6.4
	(Glucophage®)	35	6.8
	I don’t use	421	81.3
What other ways do you usually follow to lose weight in addition to using antidiabetic medications? *	Diet	423	81.7
	Other prescription medications	25	4.8
	Herbal products	55	10.6
	Exercising	348	67.2
	Others	79	15.3
What is the source of these medications? *	Pharmacy	217	41.9
	private clinics/ medical centers	127	24.5
	Hospitals	159	30.7
	Social media platforms	42	8.1
	Family and friends abroad	18	3.5
	Other sources	44	8.5
Have you had difficulty obtaining these medications recently? (n=318)	No	272	85.5
	Yes	46	14.4
If you have ever used these medications, how much weight (kg) did you lose? (n=134)	Less than 10kg	37	27.6
	More than 10kg	31	23.1
	None	19	14.2
	Others	6	4.5
	I didn't use them	41	30.6
Do you check the source of these medications when purchasing them? (n=282)	No	101	35.8
	Yes	181	64.2
Did you consult a doctor before using these medications? (n=282)	No	123	43.6
	Yes	159	56.4
Did you gain any weight back after you stopped using these medications? (n=282)	No	183	64.9
	Yes	99	35.1
Have you experienced any side effects when using these medicines? (n=281)	No	186	66.2
	Yes	74	26.3

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	Depression	1	0.4
	Abdominal pain	2	0.7
	Nausea and vomiting	3	1.1
	Hypotension	1	0.4
	I don't use these drugs	14	4.9
Do you read medical information about the products you use to lose weight?	No	117	22.6
	Yes	401	77.4

Results may overlap

Table 5 indicates a concerning trend with respect to the knowledge of antidiabetic medications prescribed for weight loss among this survey population. Just 3.7 percent were confident in their understanding of the purposes of these medications, 21.2 percent remained neutral. What's more concerning is that a remarkable 75.1 percent of the people felt uncertain about how much they knew, which left a huge knowledge gap that could have critical ramifications not only for patient education but also practice.

Table (5): Shows knowledge on the uses of antidiabetics for weight loss purposes score results.

	Frequency	**Percent**
Confident about the knowledge	19	3.7
Neutral about the knowledge	110	21.2
Unconfident about knowledge	389	75.1
Total	518	100.0

Table 6 shows a data derived from a sample cohort about attitudes towards the use of antidiabetic drugs as weight loss medications. In particular, but only a minority (15.4%) had a positive attitude, representing a very limited endorsement of this practice in the population under study. However, a substantial majority maintained a neutral attitude (55.8%); that is, little or no belief in antidiabetics' efficacy or appropriateness for use in managing weight. Additionally, 28.8% expressed a negative view, suggesting that it be perceived in terms of safety, ethical questions or side effects on themselves or others occasioned by such an off-label use of these medications.

Table (6): Shows attitude on the uses of antidiabetics for weight loss purposes score results.

	Frequency	**Percent**
Positive attitude	80	15.4
Neutral attitude	289	55.8
Negative attitude	149	28.8
Total	518	100.0

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Table (7) shows that knowledge of drugs has statistically significant relation to gender (P value=0.0001), age (P value=0.0001), height (P value=0.016), residential region (P value=0.0001), family monthly income (P value=0.037), level of education (P value=0.002), and health related profession (P value=0.003). It also shows statistically insignificant relation to marital status, health insurance status, and suffering from chronic diseases.

Table (7): Relation between knowledge of drugs and sociodemographic characteristics.

Parameters		***Knowledge of drugs***		***Total (N=518)***	***P value****
		Confident or neutral	**Unconfident**		
Gender	Female	79	162	241	0.0001
		61.2%	41.6%	46.5%	
	Male	50	227	277	
		38.8%	58.4%	53.5%	
Age	Less than 23	28	121	149	0.0001
		21.7%	31.1%	28.8%	
	23 to 30	58	93	151	
		45.0%	23.9%	29.2%	
	31 to 45	22	86	108	
		17.1%	22.1%	20.8%	
	More than 45	21	89	110	
		16.3%	22.9%	21.2%	
Marital status	Single	66	196	262	0.323
		51.2%	50.4%	50.6%	
	Married	59	187	246	
		45.7%	48.1%	47.5%	
	Divorced	4	4	8	
		3.1%	1.0%	1.5%	
	Widowed	0	2	2	
		0.0%	0.5%	0.4%	
Height	160 cm or less	55	115	170	0.016
		42.6%	29.6%	32.8%	
	161 to 170 cm	35	146	181	
		27.1%	37.5%	34.9%	
	More than 170 cm	39	128	167	
		30.2%	32.9%	32.2%	
Weight	65 kg or less	50	125	175	0.333

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		38.8%	32.1%	33.8%	
	66 to 85 kg	48	151	199	
		37.2%	38.8%	38.4%	
	More than 85 kg	31	113	144	
		24.0%	29.0%	27.8%	
Residential region	Northern region	2	21	23	0.0001
		1.6%	5.4%	4.4%	
	Southern region	30	37	67	
		23.3%	9.5%	12.9%	
	Central region	34	184	218	
		26.4%	47.3%	42.1%	
	Eastern region	27	55	82	
		20.9%	14.1%	15.8%	
	Western region	36	92	128	
		27.9%	23.7%	24.7%	
Family monthly income	Less than 7,000 Saudi riyals	21	94	115	0.037
		16.3%	24.2%	22.2%	
	7000-14999 Saudi riyals	34	125	159	
		26.4%	32.1%	30.7%	
	15,000-19,999 Saudi riyals	45	93	138	
		34.9%	23.9%	26.6%	
	More than 20,000 Saudi riyals	29	77	106	
		22.5%	19.8%	20.5%	
Highest level of education completed	Primary	0	3	3	0.002
		0.0%	0.8%	0.6%	
	Intermediate	0	3	3	
		0.0%	0.8%	0.6%	
	High School	39	97	136	
		30.2%	24.9%	26.3%	
	Diploma	4	47	51	
		3.1%	12.1%	9.8%	
	Bachelor	65	209	274	
		50.4%	53.7%	52.9%	
	Higher studies	21	30	51	
		16.3%	7.7%	9.8%	
Do you work in a	No	88	314	402	0.003

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health-related job?		68.2%	80.7%	77.6%	
	Yes	41	75	116	
		31.8%	19.3%	22.4%	
Health insurance status	Insured	54	155	209	0.686
		41.9%	39.8%	40.3%	
	Uninsured	75	234	309	
		58.1%	60.2%	59.7%	
Do you suffer from chronic diseases?	No	91	247	338	0.145
		70.5%	63.5%	65.3%	
	Yes	38	142	180	
		29.5%	36.5%	34.7%	

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

Table (8) shows that attitude towards drugs has statistically significant relation to gender (P value=0.001), and height (P value=0.010). It also shows statistically insignificant relation to age, marital status, weight, residential region, family monthly income, level of education, health related profession, health insurance status, and suffering from chronic diseases.

Table (8): Attitude towards drugs in association with sociodemographic characteristics.

Parameters		***Attitude towards drugs***		***Total (N=518)***	***P value****
		Negative attitude	**Positive and neutral attitude**		
Gender	Female	87	154	241	0.001
		58.4%	41.7%	46.5%	
	Male	62	215	277	
		41.6%	58.3%	53.5%	
Age	Less than 23	54	95	149	0.101
		36.2%	25.7%	28.8%	
	23 to 30	40	111	151	
		26.8%	30.1%	29.2%	
	31 to 45	25	83	108	
		16.8%	22.5%	20.8%	
	More than 45	30	80	110	
		20.1%	21.7%	21.2%	
Marital status	Single	84	178	262	0.119
		56.4%	48.2%	50.6%	
	Married	61	185	246	
		40.9%	50.1%	47.5%	
	Divorced	4	4	8	
		2.7%	1.1%	1.5%	

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	Widowed	0	2	2	
		0.0%	0.5%	0.4%	
Height	160 cm or less	52	118	170	0.010
		34.9%	32.0%	32.8%	
	161 to 170 cm	63	118	181	
		42.3%	32.0%	34.9%	
	More than 170 cm	34	133	167	
		22.8%	36.0%	32.2%	
Weight	65 kg or less	61	114	175	0.058
		40.9%	30.9%	33.8%	
	66 to 85 kg	55	144	199	
		36.9%	39.0%	38.4%	
	More than 85 kg	33	111	144	
		22.1%	30.1%	27.8%	
Residential region	Northern region	6	17	23	0.235
		4.0%	4.6%	4.4%	
	Southern region	18	49	67	
		12.1%	13.3%	12.9%	
	Central region	54	164	218	
		36.2%	44.4%	42.1%	
	Eastern region	31	51	82	
		20.8%	13.8%	15.8%	
	Western region	40	88	128	
		26.8%	23.8%	24.7%	
Family monthly income	Less than 7,000 Saudi riyals	34	81	115	0.994
		22.8%	22.0%	22.2%	
	7000-14999 Saudi riyals	45	114	159	
		30.2%	30.9%	30.7%	
	15,000-19,999 Saudi riyals	39	99	138	
		26.2%	26.8%	26.6%	
	More than 20,000 Saudi riyals	31	75	106	
		20.8%	20.3%	20.5%	
Highest level of education completed	Primary	0	3	3	0.061
		0.0%	0.8%	0.6%	
	Intermediate	2	1	3	
		1.3%	0.3%	0.6%	
	High School	48	88	136	
		32.2%	23.8%	26.3%	

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	Diploma	8	43	51	
		5.4%	11.7%	9.8%	
	Bachelor	76	198	274	
		51.0%	53.7%	52.9%	
	Higher studies	15	36	51	
		10.1%	9.8%	9.8%	
Do you work in a health-related job?	No	122	280	402	0.138
		81.9%	75.9%	77.6%	
	Yes	27	89	116	
		18.1%	24.1%	22.4%	
Health insurance status	Insured	64	145	209	0.442
		43.0%	39.3%	40.3%	
	Uninsured	85	224	309	
		57.0%	60.7%	59.7%	
Do you suffer from chronic diseases?	No	98	240	338	0.874
		65.8%	65.0%	65.3%	
	Yes	51	129	180	
		34.2%	35.0%	34.7%	

P value was considered significant if ≤ 0.05.

Discussion:

Knowledge, attitudes and practices of the Saudi population regarding the use of antidiabetic medications for weight loss was the objective of this cross-sectional study. Having these findings give us a foundation to understand the state of affairs as it relates to this rapidly growing trend.

A mean age of 32.5 years was found in the demographic analysis, which also showed a relatively young population and a balance of gender distribution. Additionally, a large number of respondents were single and this might affect their health seeking behavior and ways of perceiving it. The high prevalence of overweight and obesity [11, 12] in the Central region makes urgently needed intervention into effective weight management efforts in Saudi Arabia.

Surprisingly, the study showed that more than 50 percent of the participants knows Ozempic® and Mounjaro® are effective antidiabetic medications for weight loss. Secondly, there persisted a concerning knowledge gap, with 30.7% of respondents not being aware of the existence of such medications. This raises the need for enhancing awareness of the potential use, and limits, of these medications in the public and through education [13,14].

There are mixed attitudes of the participants about using of antidiabetic drugs for weight loss. A majority (67.5%) saw the need for medical supervision, but a substantial number (44.9%) rejected even the notion that these medications were the 'first and best choice' for weight loss. The fact that 39.2 percent of participants remained undecided may stem from the 39.2 percent of people who may have been skeptical about the safety and long-term efficacy for these medications. These findings imply the requirement for

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more robust clinical evidence, and transparent communication, to counter the public's reservations [15,16].

From actual practice, the study showed that the most participants (87.3%) did not use any weight loss drugs in the past year, and relied on life style changes such as dietary changes (81.7%) and exercise (67.2%). In line with cautious attitudes, this preference for non-pharmacological management is the norm. But even among those who did use weight loss medications, only 9.8% said they had taken Ozempic®, a number that raised questions about access to and the use of weight loss medications. Highly unexpectedly, only 64.2% received professional guidance prior to taking the medication when 56.4% had already consulted a physician. This highlights importance of good healthcare provider–patient communications and the adoption of excellent regulatory systems to assure effective use of these medications [17–19].

It also found vast gaps in what it knew, with just 3.7 percent of participants comfortable with their knowledge of why a person takes an antidiabetic medication to lose weight. Attitudinal findings revealed further this lack of knowledge as only a stigma of 15.4% endorsed a positive view towards using these medications for weight loss. Demographic factors such as gender and age and regional residence appear to shape knowledge and attitudes to inform the development of tailored educational interventions to meet the particular needs of some subgroups of the Saudi population [20].

The main limitation of this study is its cross-sectional design and consequently it cannot prove causality and also there is possibility of reporting bias in the data collection. The study was done in Saudi Arabia and the findings may not be generalizable to others. Future research needs to consider longitudinal designs in addition to the experiences and perspectives of healthcare providers to capture aspects about this issue that might be obscured when the timeframe is more restricted.

Conclusion:

The findings of this study underscore the importance of enhancing education and increasing health care providers' communications with patients about the use of antidiabetic medication for weight loss, and developing strong regulatory standards for ensuring safe and appropriate use of antidiabetic medications for weight loss given to the Saudi population. The findings highlight the complexity of the acceptability and deployment of these novel weight management strategies, as well as the need to address the gaps in knowledge and attitude to maximise the uptake of evidence based and responsible practice.

Acknowledgement:

We acknowledge all of the volunteers who provided samples for this research.

Ethical approval:

After fully explaining the study and emphasizing that participation is optional, each participant gave their informed consent. The information gathered was safely stored and utilized exclusively for study.

ISSN:1624-1940
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Funding:

This study was not supported by any outside sources.

Conflict of interests:

The authors declare no conflict of interest.

Informed consent:

Written informed consent was acquired from each individual study participant.

Data and materials availability:

All data associated with this study are present in the paper.

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