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From miracle cure to misuse? The opportunities and challenges of glp-1 medications in the context of obesity stigma

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ABSTRACT

Background: GLP-1 receptor agonists have gained increasing attention for their effectiveness in weight management and diabetes treatment. Their widespread use intersects with societal pressures related to body image and persistent obesity stigma, which may influence public perceptions and acceptance. Understanding how knowledge, attitudes, and stigma interact is essential to support informed and appropriate use of GLP-1 medications. This study aimed to assess the opportunities and challenges of GLP-1 medication use within the context of obesity-related stigma in Saudi Arabia.

Methods: A cross-sectional online survey was conducted between January and March 2025 among adults in Saudi Arabia. After excluding incomplete responses, data from 742 participants were analyzed. The questionnaire collected information on sociodemographic characteristics, knowledge of GLP-1 medications, attitudes toward their use, and obesity stigma. Reliability was assessed using Cronbach's alpha. Statistical analyses included descriptive statistics, Pearson correlation, independent t-tests, one-way ANOVA, and multiple linear regression, with statistical significance set at $p < 0.05$.

Results: Participants demonstrated relatively high knowledge of GLP-1 medications ($M = 12.64$, $SD = 2.04$), while attitudes showed moderate variability ($M = 10.12$, $SD = 2.43$). Stigma scores were more widely distributed ($M = 14.31$, $SD = 3.58$). Knowledge was positively correlated with favorable attitudes toward GLP-1 use, whereas obesity stigma showed negative associations with both knowledge and attitudes. Significant differences in attitudes were observed across gender, age, education level, and overweight or obesity diagnosis. Regression analysis indicated that knowledge and stigma jointly explained 39% of the variance in attitudes, with higher knowledge predicting more positive attitudes and higher stigma predicting less favorable perceptions.

Conclusion: In conclusion, both knowledge and obesity stigma significantly influence public attitudes toward GLP-1 medications. Enhancing public understanding while addressing weight-related stigma may foster more responsible, informed, and compassionate use of GLP-1 therapies in weight management care.

Keywords: GLP-1 receptor agonists, semaglutide, tirzepatide, obesity stigma, health behaviour.
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INTRODUCTION

Obesity remains a major public-health concern worldwide and is strongly linked to chronic conditions such as diabetes and cardiovascular disease.[1,2] Although lifestyle modification is the first-line approach for weight control, many individuals struggle to achieve sustained improvement. This challenge has contributed to increased interest in medical therapies that provide more predictable outcomes.[3]

Among these options, GLP-1 receptor agonists, particularly semaglutide and tirzepatide, have gained significant attention for their ability to support weight reduction and improve glycemic control. Their clinical performance has led to rapid growth in public awareness and a perception that they represent a promising therapeutic development in obesity care.[4,5] However, increased use has brought forward several concerns. Social media promotion, expectations of rapid weight loss, and use outside approved indications have raised questions regarding safety, equitable access, and medication shortages for individuals who rely on GLP-1 agents for diabetes management.[6]

These issues interact with another factor, including obesity stigma. Individuals living with excess weight often face assumptions, criticism, and unfair treatment, which may discourage engagement with healthcare services and contribute to emotional distress.[7,8]

Obesity stigma is defined as negative societal attitudes and beliefs directed toward individuals with excess weight, often grounded in the perception that obesity is primarily the result of personal responsibility rather than a complex, chronic disease influenced by biological, environmental, and social determinants; such stigma has been consistently associated with discriminatory practices, suboptimal patient–provider interactions, and reduced utilization of healthcare services.[9] Within this context, the increasing visibility and use of GLP-1 receptor agonists may constitute a double-edged phenomenon. While these medications have the potential to reinforce the conceptualisation of obesity as a medical condition and thereby mitigate moral blame, perceptions of pharmacological weight loss as a "shortcut," together with unequal access and high treatment costs, may perpetuate existing biases or contribute to the emergence of new forms of weight-related stigma.[10]

Therefore, understanding how knowledge, attitudes, and weight-related beliefs influence perceptions of GLP-1 medications is essential. By examining these elements together, this study aims to evaluate the opportunities and challenges of GLP-1 medications in the context of obesity stigma.

METHODS

Study Design and Setting

This study used a cross-sectional survey design to evaluate public knowledge, attitudes, and stigma toward GLP-1 medications. The study population consisted of adults living in Saudi Arabia. Data collection was conducted between January and March 2025 using an online questionnaire administered through Google Forms, allowing broad geographic coverage and efficient data acquisition.

Participants and Sampling

A convenience sampling approach was used. Adults aged 18 years or older residing in Saudi Arabia were eligible to participate. Participants were required to complete all core sections of the questionnaire assessing knowledge, attitudes, and obesity-related stigma toward GLP-1 medications.

Survey Instrument

The survey instrument was created after a thorough examination of relevant literature and consisted of four major elements. The first portion gathered sociodemographic information such as age, gender, region of residence, marital status, educational level, job status, and the existence of chronic illnesses. The second section assessed participants' knowledge of GLP-1 medications, focusing on their purpose, indications, mechanism of action, benefits, and potential risks. The third section explored attitudes toward GLP-1 medication use, including willingness to use the medication, perceived fairness, and concerns regarding misuse. The fourth section evaluated obesity-related stigma using items adapted from established public stigma instruments and the Weight Bias Internalisation Scale. The survey instrument was created after a thorough examination of relevant literature and consisted of four major elements. The first portion gathered sociodemographic information such as age, gender, region of residence, marital status, educational level, job status, and the existence of chronic illnesses.

Inclusion and Exclusion Criteria

Participants were eligible for inclusion if they were individuals aged 18 or older, lived in Saudi Arabia at the time of data collection, and gave electronic informed consent. Eligible participants were required to complete all core sections of the questionnaire assessing knowledge, attitudes, and obesity-related stigma toward GLP-1 medications. Participants were excluded if they were unable to read and understand Arabic. Individuals with a self-reported diagnosis of type 1 diabetes were excluded due to differences in treatment indications and disease characteristics relative to the study focus. Responses with missing or incomplete data in key study variables, including knowledge, attitude, or stigma scores, were also excluded from the final analysis.

Data Collection Procedure

Participants accessed the survey over a secure internet connection. The first page of the questionnaire included an electronic informed consent form that described the study's aims, voluntary participation, confidentiality of replies, and the possibility to withdraw at any moment without penalty. Only participants who selected the "Agree" option were allowed to advance with the questionnaire. The average time to finish the survey was 8-10 minutes.

Missing Data Handling

All submitted responses were screened prior to analysis. Participants with missing values in key analytical variables (knowledge, attitude, or stigma total scores) were excluded using a listwise deletion approach, resulting in a final analytical sample of 742 participants. Some sociodemographic variables contained occasional missing responses; therefore, missing values for these variables are reported descriptively in **Table 1**. All inferential analyses were conducted using the final analytical sample (n = 742). No imputation methods were applied.

Statistical analysis

Statistical analyses were carried out using IBM SPSS Statistics version 29. Descriptive statistics, such as frequencies, percentages, means, and standard deviations, were employed to summarise participant characteristics and primary research variables. Composite scores for knowledge, attitudes, and stigma were calculated after reverse-coding negatively worded items. Differences in attitude ratings between two independent groups were investigated using independent samples t-tests, with Welch's t-test used when the assumption of variance homogeneity was broken. Group comparisons involving more than two categories, including age groups and education levels, were assessed using one-way analysis of variance. Pearson correlation coefficients were used to investigate associations between knowledge, attitudes, and stigma. Multiple linear regression analysis was used to determine predictors of attitudes regarding

GLP-1 medicine usage, with knowledge and stigma serving as the key independent variables. Statistical significance was determined at $p < 0.05$.

Potential Bias

Several restrictions should be acknowledged when interpreting the results. The practice of convenience sampling may lower the sample's representativeness and restrict generalizability to the larger population. Additionally, data were collected through self-reported measures, which may be subject to information bias, including recall bias and socially desirable responding.

Table 1. Sociodemographic Characteristics of Participants

Variable	n	%
Gender		
Female	387	52.2
Male	353	47.6
Age group (years)		
18–24	191	25.8
25–34	237	31.9
35–44	176	23.7
45–54	91	12.3
≥55	47	6.3
Education level		
High school or less	62	8.4
Diploma	74	10.0
Bachelor's degree	504	67.9
Postgraduate (Master/PhD)	87	11.7
Diagnosed overweight/ obese		
Yes	278	37.5
No	463	62.4

Note: Percentages may not total 100% due to rounding and missing responses. The final analytical sample included 742 participants after exclusion of cases with missing data in key study variables.

RESULTS

A total of 742 participants were included in the final analysis after removing incomplete or invalid responses. Table 1 presents the sociodemographic characteristics of the sample. Slightly more than half of the respondents were female (52.8%). Most participants were between 25 and 34 years of age (32.6%), and the majority held a bachelor's degree (66.4%). About one-third reported having been diagnosed with overweight or obesity (36.4%).

Cronbach's alpha values for the three domains demonstrated acceptable reliability. Knowledge ($\alpha = 0.78$), Attitude ($\alpha = 0.82$), and Stigma ($\alpha = 0.80$) all exceeded the threshold for internal consistency. These values indicate that items within each domain measured their intended constructs consistently (Table 2).

Table 3 presents the descriptive statistics for knowledge, attitude, and stigma scores. Knowledge scores showed a relatively high mean ($M = 12.64$, $SD = 2.04$), indicating generally adequate understanding of GLP-1 medications among participants. Attitude scores demonstrated moderate variability ($M = 10.12$, $SD = 2.43$), while stigma scores exhibited wider dispersion ($M = 14.31$, $SD = 3.58$), suggesting substantial variability in weight-related stigma perceptions.

Table 4 shows a moderate positive link between knowledge and attitudes toward GLP-1 usage ($r = 0.41$, $p < 0.001$). Higher levels of weight-related stigma were linked to lesser knowledge and less favourable views towards GLP-1 drugs ($r = -0.22$, $p < 0.001$ and $r = -0.36$, $p < 0.001$, respectively), showing a negative correlation.

Higher stigma scores indicated greater weight-related stigma and beliefs. Group comparisons revealed several significant differences in attitude scores. Participants diagnosed with overweight or obesity reported significantly more favourable attitudes toward GLP-1 medications compared with those without such a diagnosis (Welch's $t = -6.12$, $p < 0.001$). Significant differences in attitudes were also observed across gender (Welch's $t = 3.49$, $p < 0.001$), age groups ($F(4) = 7.51$, $p < 0.001$), and education levels ($F(3) = 11.27$, $p < 0.001$), as shown in Table 5.

A multiple linear regression model was employed to investigate the determinants of opinions about GLP-1 medicines. The model explained 39% of the variation in attitudes ($R^2 = 0.39$). Knowledge was favourably linked with attitudes ($B = 0.42$, $p < 0.001$), whereas stigma was negatively associated ($B = -0.20$, $p < 0.001$). These findings show that more understanding and less stigma are related to more positive attitudes toward GLP-1 treatment (Table 6).

Figure 1 illustrates the distribution of participant responses related to the main study constructs. The overall pattern reflects variability in awareness levels, beliefs, and attitudes toward GLP-1 medications.

Table 2. Internal Consistency Reliability for Study Domains

Domain	Items (k)	Cronbach's α
Knowledge	4	0.78
Attitude	3	0.82
Stigma (combined)	5	0.8

Note. Cronbach's α values of > 0.70 suggest good internal consistency.

Table 3. Descriptive Statistics for Domain Total Scores

Domain	M	SD	Min	Max	Valid n
Knowledge	12.64	2.04	5	16	742
Attitude	10.12	2.43	3	15	742
Stigma	14.31	3.58	5	25	742

DISCUSSION

This study explored public knowledge, attitudes, and stigma related to GLP-1 medications among adults in Saudi Arabia. The results showed that participants generally had a good understanding

Table 4. Pearson Correlations Among Study Domains

Domain	r	p-value
Knowledge vs Attitude	0.41***	0,001
Knowledge vs Stigma	–0.22***	0,001
Attitude vs Stigma	–0.36***	0,001

of these medications, which reflects increasing clinical and public exposure to GLP-1 therapies in recent years. [10] Knowledge was strongly associated with more supportive attitudes, suggesting that individuals who understand the purpose, benefits, and proper indications of GLP-1 medications may be more open to their responsible use. Similar findings have been reported in earlier research, where informed individuals showed greater confidence in available weight-management options.[11]

Stigma toward obesity emerged as an important factor. In this study, stigma has corelation with knowledge and attitude, even though the correlation is weak. Higher stigma scores corresponded to less favourable attitudes and lower knowledge. These patterns indicate that negative assumptions about body weight may influence how individuals interpret information about treatment and whether they view medical options as valid or acceptable. Existing literature shows that weight stigma is linked to lower engagement with healthcare, reluctance to seek treatment, and emotional distress.[8,12,13] Findings from this study support these observations, emphasising the need to address stigma as part of public-health communication.

Beyond its impact on healthcare engagement, obesity stigma may also shape public perceptions of pharmacological weight-management strategies. Previous literature suggests that while the availability of effective medications such as GLP-1 receptor agonists has the potential to reframe obesity as a chronic medical condition rather than a personal failing, their increasing visibility may simultaneously reinforce stigma when these therapies are perceived as a shortcut or as accessible only to privileged groups. Such dual perceptions may contribute to moral judgments toward medication users and exacerbate existing social inequalities in obesity care. These dynamics provide an important context for interpreting the present findings, particularly the inverse relationship observed between stigma and both knowledge and attitudes toward GLP-1 therapies.[10]

Differences across demographic groups were also observed. Participants diagnosed with overweight or obesity expressed more favourable attitudes toward GLP-1 therapies, which may reflect personal experience with weight-management challenges. Gender, age, and education differences further suggest that tailored educational approaches may help ensure that information is accessible and relevant to different segments of the population. Similar recommendations appear in clinical guidelines that emphasize individualized communication and patient-centered counseling[14,15]

The regression analysis highlighted knowledge and stigma as key predictors of attitudes, accounting for a substantial proportion of the variance. Although several sociodemographic variables were associated with attitudes in group comparisons, the primary model focused on knowledge and stigma to maintain conceptual clarity. Alternative models were tested and are available upon request. These findings suggest that improving understanding of GLP-1 medications and reducing weight-related biases may support more balanced and accurate perceptions of these therapies.

Participants also identified barriers to GLP-1 use, such as concerns about side effects and medication cost. These barriers reflect issues commonly reported in studies examining access, affordability, and safety perceptions of weight-loss medications.[14-16] Addressing these concerns may require clearer clinical communication and health-system strategies that support equitable access and appropriate prescribing. Overall, the findings reinforce the need to pair accurate

Table 5. Group Differences in Attitude Toward GLP-1 Medications

Variables	Test	df	Statistic	p
Gender	Welch's *t*	—	3.49	< 0.001
Age group	ANOVA	4	7.51	< 0.001
Education	ANOVA	3	11.27	< 0.001
Diagnosed overweight/obese	Welch's *t*	—	−6.12	< 0.001

Table 6. Linear Regression Predicting Attitude Toward GLP-1 Medications

Predictors	B	SE	t	P
Intercept	2.14	0.21	9.98	<0 .001
Knowledge total	0.43	0.02	20.2	< 0.001
Stigma total	−0.21	0.02	−12.46	< 0.001

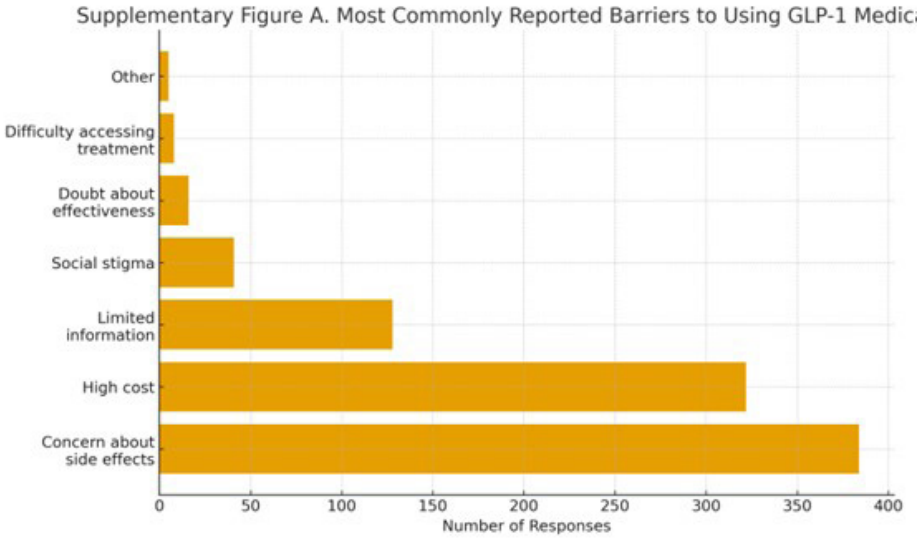

Figure 1. Distribution of Participant-Reported Barriers to the Use of GLP-1 Medications.

medical information with efforts to reduce stigma, encourage informed decision-making, and promote compassionate approaches to weight care.

CONCLUSION

This study examined public perceptions of GLP-1 medications in relation to knowledge, attitudes, and obesity-related stigma. Participants generally demonstrated strong awareness of GLP-1 therapies, and higher knowledge was associated with more supportive attitudes. Stigma, however, remained a meaningful factor linked to lower knowledge and less favourable views. Improving public understanding of obesity as a health condition and addressing misconceptions about GLP-1 medications may help promote responsible and informed use. Healthcare providers can contribute by offering clear explanations, setting realistic expectations, and acknowledging the social and emotional factors that influence patient experiences. Combining education, stigma-reduction strategies, and thoughtful prescribing practices may support the safe and appropriate integration of GLP-1 therapies into weight-management care.

DISCLOSURE

Ethical Statement

The Research Ethics Committee of the University of Hail in Saudi Arabia (H-2025-121) gave ethical permission for the research, which adhered to the principles of the Declaration of Helsinki. Participants were anonymous, and no identifying information was gathered.

Conflict of Interest

The authors state that they have no conflicts of interest in this work. There were no personal, financial, or academic affiliations that impacted the study's design, analysis, or reporting.

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Authors' Contributions

A.A.A. led the conceptualisation, study design, methodology, data analysis, manuscript drafting, and overall supervision. W.A. contributed to questionnaire development, data collection, and initial drafting. L.A., S.G., and E.A. supported data collection, data management, and refinement of the Methods and Results sections. D.A. provided statistical support and prepared the tables. A.M.A.T. and K.N. reviewed clinical and pharmacotherapy-related content on GLP-1 medications. G.K. contributed to the stigma-related conceptual framework. A.A. and A.A. revised the survey instrument, discussion, and reporting accuracy. Z.A., A.B., and M.A. assisted with data entry, reference management, and manuscript editing. F.A. carefully reviewed the article for correctness and coherence. All authors reviewed and approved the final article.

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