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ORIGINAL ARTICLE

Knowledge, Attitudes and Practices of Healthcare Workers regarding Obesity: A Survey at a Tertiary Hospital in Vietnam

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Abstract

Background. The global prevalence of obesity has tripled over the past four decades, with an estimated one-third of the world's population currently classified as overweight or obese. Obesity is recognized as one of the most urgent global public health challenges, with increasing rates observed in both developed and developing countries. In Southeast Asia, the burden of obesity is particularly concerning due to the coexistence of undernutrition and overnutrition, creating a double burden of disease. Healthcare workers play a critical role in the prevention, early detection and management of obesity. However, many healthcare workers lack updated knowledge on obesity, which is often associated with insufficient or inappropriate management.

Objective. To assess the knowledge, attitudes, and practices (KAP) of healthcare workers toward obesity management at a tertiary hospital in Ho Chi Minh City, Vietnam, and to identify associated barriers and interprofessional differences.

Methodology. A cross-sectional study was conducted among 232 healthcare workers using a 22-item structured, self-administered questionnaire. The survey evaluated knowledge of obesity risk factors and treatments, attitudes toward patient responsibility and stigma, and clinical practices such as screening, counseling and referrals. Associations between professional roles and responses were analyzed using Chi-square and Fisher's exact tests.

Results. Among 232 participants (37.5% were physicians and 62.5% were non-physician healthcare workers), only 63.8% [95% CI: 57.3-70.3%] recognized obesity as a chronic disease and fewer than half were aware of approved pharmacotherapies. While most workers believed they could assist patients, a significant majority (79.7% [95% CI: 75.0–84.9%]) attributed weight loss primarily to patient responsibility, indicating widespread implicit weight bias. Furthermore, physicians reported significantly higher odds of inadequate knowledge of weight management compared to other staff (OR = 4.5, 95% CI: 2.1–9.5).

Conclusion. Significant knowledge gaps and implicit weight biases persist among healthcare workers regarding obesity management. Addressing these educational and systemic barriers through specialized training and multidisciplinary care models in Vietnam can provide a crucial framework for improving obesity management across rapidly urbanizing Southeast Asian nations facing similar metabolic crises.

Key words: obesity, healthcare worker, knowledge, attitudes, practice, Vietnam

INTRODUCTION

Obesity has emerged as one of the most pressing global public health crises of the 21st century. The global prevalence of obesity has tripled over the past four decades, with an estimated one-third of the world's population currently classified as overweight or obese.[1] According to the updated World Health Organization (WHO) 2024 report, the global obesity rate has doubled between 1990 and 2022. By 2022, approximately 46% of the global adult population was classified as overweight and 16% as obese.[2] In Asia, including Southeast Asia, the prevalence of obesity is projected to increase by 10%–20%.[3]

Despite this escalating crisis, a significant gap in clinical practice remains. Healthcare workers (HCWs) play a critical role in the prevention, early detection and management of obesity; however, many lack updated knowledge and formal training, potentially resulting in insufficient or inappropriate care.[4]

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In Southeast Asia, the burden is particularly concerning due to the coexistence of undernutrition and overnutrition, creating a double burden of disease.[5] Vietnam's rapid urbanization, marked by changes in dietary patterns and lifestyle behaviors and reductions in physical activity, has led to a sharp rise in overweight and obesity rates.[6,7] Notably, higher obesity prevalence rates and metabolic risks are observed in this population when applying the Asian-specific BMI cutoffs (overweight ≥23 kg/m², obesity ≥25 kg/m²) compared to the standard WHO classification.[8-11] In 2022, the Vietnamese Ministry of Health issued national guidelines on the diagnosis and treatment of obesity,[12] reflecting growing attention from health authorities. However, obesity is still underrecognized in both society and the healthcare sector. Many healthcare workers lack updated knowledge on obesity, which may be linked to insufficient or inappropriate management.

Although previous studies have examined patient perceptions of obesity,[13] there is little research that has focused on Healthcare workers. Therefore, assessing the knowledge, attitudes, and practices (KAP) of healthcare workers is essential. Such evaluation could inform strategies to improve professional training, reshape attitudes and enhance obesity management, thereby contributing to population-level efforts to reduce overweight and obesity rates. Based on these objectives, we conducted this study to investigate the healthcare workers' knowledge, attitudes and practices regarding obesity.

METHODOLOGY

Study design

This was a descriptive cross-sectional, multi-departmental study conducted at Le Van Thinh Hospital.

Study population

Sample size estimation

The minimum required sample size was estimated using the formula for a single population proportion:

$$n = Z^2_{[1-(\alpha/2)]} \frac{p(1-p)}{d^2}$$

We set the confidence level at 95% (Z = 1.96) and the margin of error at 5% (d = 0.05). The expected proportion (p) was set to 0.84, based on a previous regional study across South and Southeast Asia in which 84% of healthcare workers correctly recognized obesity as a chronic disease.[14] This calculation yielded a minimum sample size of 207. Our final recruited sample of 232 healthcare workers exceeded this requirement, ensuring adequate statistical power to address the research objectives and account for any potential nonresponse or incomplete data.

Participants were recruited using convenience sampling between June and September 2024. The research team introduced the study objectives and invited clinical staff to participate during regular departmental meetings. Inclusion criteria comprised clinical healthcare workers (physicians, nurses, midwives and technicians) actively working at the hospital for at least three months and provided written informed consent. Exclusion criteria included non-clinical administrative staff, individuals who declined to participate and those who submitted incomplete questionnaires. A total of 232 fully completed questionnaires were collected and retained for analysis. A paper-based questionnaire was administered to clinical staff during regular departmental meetings. The completion process, supervised by the research team to ensure data integrity, took approximately 15 minutes per participant.

Questionnaire development and validation

The 22-item questionnaire was developed based on the 2022 National Guidelines for the Diagnosis and Management of Obesity released by the Vietnamese Ministry of Health and adapted from previously validated KAP instruments reported in the recent literature. Face and content validity were evaluated by an expert panel comprising two endocrinologists and one public health specialist. Following expert revisions, the instrument was pilot-tested on a purposive sample of 20 healthcare workers (including physicians and nurses) to assess clarity, cultural appropriateness and completion time. To avoid prior exposure bias, these pilot participants were excluded from the final study sample. The internal consistency of the finalized questionnaire was evaluated using the full study sample (N = 232), demonstrating excellent reliability with an overall Cronbach's alpha of 0.850. The domain-specific alpha coefficients were 0.819 for Knowledge, 0.689 for Attitudes, and 0.646 for Practices.

Definition of outcomes and exposures

The primary outcomes were the proportions of healthcare workers demonstrating adequate knowledge, positive attitudes and appropriate clinical practices regarding obesity management. Secondary outcomes included the frequency of reported barriers to obesity management and the interprofessional differences in KAP domains.

Composite scores were not generated; KAP domains were analyzed individually. Knowledge items were categorized based on the Vietnamese Ministry of Health Guidelines. Attitudes were evaluated as positive if participants agreed with evidence-based statements regarding obesity care. Practices were assessed based on the appropriateness of clinical recommendations (e.g., lifestyle modifications, pharmacotherapy or referral) across different patient body mass index (BMI) and comorbidity profiles.

The primary exposures evaluated for their association with KAP outcomes were participants' professional roles

(categorized as physicians versus other healthcare workers, including nurses, midwives and technicians), BMI and years of medical experience.

Data analysis

Data completeness was verified prior to entry. Questionnaires with missing responses were excluded. Only fully completed forms were retained for the final analysis, ensuring no missing data within the analyzed dataset.

Data were entered using Epidata version 3.1 and analyzed with SPSS version 26.0. Before inferential analysis, the normality of continuous variables was assessed using the Shapiro-Wilk test. Normally distributed data were summarized using means and standard deviations, whereas non-normally distributed data were presented as medians and interquartile ranges (IQR). Descriptive statistics were used to present the data as percentages.

Associations between categorical variables were evaluated using the Pearson Chi-square test. The assumptions for Chi-square testing were verified prior to interpretation; Fisher's exact test was used where more than 20% of expected cell frequencies were less than 5. The threshold for statistical significance was defined as a two-tailed *p*-value of <0.05. To adjust for potential confounders, stratified analyses by participant BMI and years of medical experience were performed to assess their association with the KAP outcomes.

Ethical considerations

Participation in this study was strictly voluntary. Participants were explicitly informed that they could decline to participate or withdraw from the study at any time without negative consequences to their employment, performance evaluations or professional standing at the hospital.

To ensure absolute participant confidentiality, the study was designed to be completely anonymous. We did not collect any personally identifiable information, such as names, employee identification numbers or contact details in the questionnaires. Each completed questionnaire was assigned a random study code solely for data entry and statistical analysis.

The study was approved by the Ethics Committee of Le Van Thinh Hospital under Decision No. 09/HDDD-BVLVT, issued on June 28, 2024.

RESULTS

The median age of participants was 31 years, with an interquartile range of 8. The majority of healthcare workers were under 40 years old (85.4%). Females accounted for 70.3% of the participants. Nearly half of the study population was classified as overweight or obese. Regarding professional roles, most participants (62.5%) were non-physician healthcare workers (including nurses, midwives and technicians), while physicians accounted for 37.5% of the sample.

Regarding years of experience, most participants had worked in healthcare for 1 to less than 5 years (38.8%), followed by 5 to less than 10 years (26.7%) and 10 years or more (27.2%). The proportion of female participants was significantly higher among non-physician healthcare workers than among physicians (p <0.001).

Table 1. Characteristics of the Study Population (N = 232)

Characteristic	Total, n (%) (N = 232)	Physicians, n (%) (N = 87)	Other HCWs, n (%) (N = 145)	*p*-value
Gender				
Male	69 (29.7)	44 (50.6)	25 (17.2)	<0.001
Female	163 (70.3)	43 (49.4)	120 (82.8)	
Body Mass Index (BMI)				
Underweight	14 (6.0)	10 (11.5)	4 (2.8)	0.064
Normal weight	115 (49.6)	38 (43.7)	77 (53.1)	
Overweight	46 (19.8)	20 (23.0)	26 (17.9)	
Obesity Class I	50 (21.6)	17 (19.5)	33 (22.8)	
Obesity Class II	7 (3.0)	2 (2.3)	5 (3.4)	
Age group (years)				
<30	92 (39.7)	41 (47.1)	51 (35.2)	0.315
30 – 39	106 (45.7)	35 (40.2)	71 (49.0)	
40 – 49	24 (10.3)	7 (8.0)	17 (11.7)	
50 – 59	10 (4.3)	4 (4.6)	6 (4.1)	
≥60	0 (0)	0 (0)	0 (0)	
Ethnicity				
Kinh	219 (94.4)	81 (93.1)	138 (95.2)	0.562
Other	13 (5.6)	6 (6.9)	7 (4.8)	
Years of medical experience				
<1	17 (7.3)	12 (13.8)	5 (3.4)	<0.001
1 – <5	90 (38.8)	43 (49.4)	47 (32.4)	
5 – <10	62 (26.7)	18 (20.7)	44 (30.3)	
≥10	63 (27.2)	14 (16.1)	49 (33.8)	

Table 2. Knowledge regarding obesity among healthcare workers (N = 232)

Survey Question	N (%)	95% CI
Perception of obesity		
1. Obesity is a disease	148 (63.8)	57.3-70.3%
2. Obesity is a health condition, but not a disease	84 (36.2)	29.7-42.7%
Knowledge of causes of obesity		
1. Nutritional causes	208 (89.7)	85.8-93.5%
2. Genetic causes	137 (59.1)	52.6-65.5%
3. Pathological causes	42 (18.1)	13.4-23.3%
4. Endocrine disorders	146 (62.9)	56.9-69.4%
5. Medication use	96 (41.4)	35.3-47.8%
6. Do not know	14 (6.0)	3.0-9.1%
Knowledge of obesity diagnostic methods		
1. Body Mass Index (BMI)	209 (90.1)	85.8-93.5%
2. Waist circumference measurement	127 (54.7)	48.3-61.2%
3. Abdominal ultrasound to assess subcutaneous fat	68 (29.3)	23.7-35.3%
4. Dual-energy X-ray absorptiometry (DEXA)	44 (19.0)	14.2-24.1%
5. Body fat–muscle index using specialized scales	111 (47.8)	40.9-54.3%
6. Do not know	21 (9.1)	5.6-12.5%
Knowledge of obesity treatment methods		
1. Dietary restriction	212 (91.4)	87.5-94.8%
2. Physical exercise	201 (86.6)	82.3-90.5%
3. Pharmacologic therapy	119 (51.3)	44.8-57.8%
4. Liposuction or fat-removal surgery	59 (25.4)	20.3-31.0%
5. Fat destruction using ultrasound	32 (13.8)	9.9-18.5%
6. Bariatric surgery (e.g., gastric reduction)	80 (34.5)	28.4-40.5%
7. Do not know	13 (5.6)	3.0-8.6%
Knowledge of anti-obesity medications approved by the Ministry of Health (Vietnam)		
1. Orlistat	115 (49.6)	43.1-56.0%
2. Sibutramine	23 (9.9)	6.5-13.8%
3. Liraglutide	76 (32.8)	27.2-38.8%
4. Diuretics	15 (6.5)	3.4-9.9%
5. Do not know	95 (40.9)	34.5-47.0%

Respondents could select multiple options; percentages exceed 100%.

Among non-physician healthcare workers, the proportion with less than one year of experience was the lowest. The remaining experience groups each accounted for approximately one-third of the sample. In contrast, among physicians, nearly 50% had 1 to less than 5 years of experience. This difference was statistically significant ($p < 0.001$).

There were no statistically significant differences between physicians and non-physician healthcare workers in BMI, age group or ethnicity. (Table 1)

Knowledge

Among the 232 participants, 148 (63.8%; 95% CI: 57.3-70.3%) considered obesity to be a disease. Nutritional factors were most commonly cited as the cause of obesity (89.7%; 95% CI: 85.8-93.5%), followed by endocrine disorders and genetic predisposition, each selected by over half of respondents.

Regarding methods for diagnosing obesity, more than 90% (90.1%; 95% CI: 85.8-93.5%) of participants identified body mass index (BMI) as the primary diagnostic tool, followed by waist circumference measurement (54.7%; 95% CI: 48.3-61.2%). Meanwhile, only 19.0% (95% CI: 14.2-24.1%) selected dual-energy X-ray absorptiometry (DEXA) and 47.8% (95% CI: 40.9-54.3%) chose body fat–muscle composition analysis using a specialized scale.

The two most commonly selected obesity treatment methods were dietary restriction (91.4%; 95% CI: 87.5-94.8%) and physical activity (86.6%; 95% CI: 82.3-90.5%). In contrast, only 51.3% (95% CI: 44.8-57.8%) selected pharmacologic treatment and 34.5% (95% CI: 28.4-40.5%) chose bariatric surgery.

Fewer than half of healthcare workers were aware of nationally approved pharmacotherapies (orlistat 49.6% [95% CI: 43.1-56.0%], liraglutide 32.8% [95% CI: 27.2-38.8%]), with 40.9% [95% CI: 34.5-47.0%] reporting no knowledge of possible treatments. (Table 2)

Attitudes

When asked about the roles of physicians and patients in obesity management, over 90% (90.1%; 95% CI: 86.2-93.5%) of participants agreed that physicians can help patients healthily lose weight, and 79.7% (95% CI: 75.0-84.9%) believed that the responsibility for weight loss lies with the patient. Regarding the initiation of obesity treatment, 93.5% (95% CI: 90.1-96.6%) of participants stated they would treat obesity in patients with comorbidities, while only 84.1% (95% CI: 79.3-88.4%) agreed to treat patients without comorbidities.

Regarding concern about obesity, more than half of the healthcare workers reported being very concerned about

Table 3. Attitudes and level of concern about obesity among healthcare workers

Survey Question	Total, n (%) (N = 232)	Physicians, n (%) (N = 87)	Other HCWs, n (%) (N = 145)	*p*-value
"Physicians can help patients lose weight in a healthy way"				
Agree	209 (90.1) [95% CI: 86.2-93.5%]	76 (87.4) [95% CI: 80.0-93.6%]	133 (91.7) [95% CI: 86.9-96.2%]	0.281*
Disagree	23 (9.9) [95% CI: 6.5-13.8%]	11 (12.6) [95% CI: 6.4-20.0%]	12 (8.3) [95% CI: 3.8-13.1%]	
"Weight loss is the patient's responsibility"				
Agree	185 (79.7) [95% CI: 75.0-84.9%]	66 (75.9) [95% CI: 66.7-84.5%]	119 (82.1) [95% CI: 75.2-87.8%]	0.255*
Disagree	47 (20.3) [95% CI: 15.1-25.0%]	21 (24.1) [95% CI: 15.5-33.3%]	26 (17.9) [95% CI: 12.2-24.8%]	
Would recommend obesity treatment if the patient has obesity with comorbidities				
Agree	217 (93.5) [95% CI: 90.1-96.6%]	79 (90.8) [95% CI: 84.2-96.5%]	138 (95.2) [95% CI: 91.2-98.1%]	0.190*
Disagree	15 (6.5) [95% CI: 3.4-9.9%]	8 (9.2) [95% CI: 3.5-15.8%]	7 (4.8) [95% CI: 1.9-8.8%]	
Would recommend obesity treatment if the patient has obesity without comorbidities				
Agree	195 (84.1) [95% CI: 79.3-88.4%]	68 (78.2) [95% CI: 69.2-86.7%]	127 (87.6) [95% CI: 82.0-92.8%]	0.058*
Disagree	37 (15.9) [95% CI: 11.6-20.7%]	19 (21.8) [95% CI: 13.3-30.8%]	18 (12.4) [95% CI: 7.2-18.0%]	
Level of concern about obesity in patients				
Very concerned	126 (54.3) [95% CI: 47.8-60.3%]	47 (54.0) [95% CI: 43.2-64.4%]	79 (54.5) [95% CI: 45.9-62.7%]	0.971*
Somewhat concerned	86 (37.1) [95% CI: 31.0-43.1%]	32 (36.8) [95% CI: 26.7-46.7%]	54 (37.2) [95% CI: 29.5-45.4%]	
Not concerned	20 (8.6) [95% CI: 5.2-12.1%]	8 (9.2) [95% CI: 3.6-15.7%]	12 (8.3) [95% CI: 4.2-12.9%]	

*Pearson's Chi-square test; **Fisher's exact tests.

the issue, over one-third expressed some concern, and only 8.6% (95% CI: 5.2-12.1%) stated they were not concerned about obesity. There was no statistically significant difference in attitudes toward obesity or in the level of concern between physicians and other healthcare workers (Table 3).

Practices

In the management of patients with obesity, 83.6% (95% CI: 78.5-88.4%) of respondents recommended lifestyle modification for those with a BMI between 25 and 30 who had no comorbidities. For patients with a BMI between 30 and 35 without comorbidities, 72.4% (95% CI: 66.4-78.0%) recommended lifestyle modification, and 59.1% (95% CI: 52.6-65.5%) suggested referral to an obesity specialist. In patients with a BMI between 27 and 35 and comorbidities, three approaches were selected at nearly equal rates: lifestyle modification (66.4%; 95% CI: 59.9-72.0%), pharmacologic treatment (62.1%; 95% CI: 56.0-68.1%) and referral to an obesity specialty clinic (61.2%; 95% CI: 54.7-67.2%) (Table 4). Treatment recommendations varied depending on the patient's BMI and comorbidity profile, as illustrated in Figure 1.

When discussing barriers to communicating with patients about obesity, nearly 90% of healthcare workers reported encountering at least one obstacle. The most commonly cited barrier was "lack of patient motivation" (80.2%; 95% CI: 75.4-85.3%), followed by "patient sensitivity about weight" (57.3%; 95% CI: 50.9-63.4%). Other frequently reported barriers included "lack of time during consultations" (42.7%; 95% CI: 36.2-49.6%) and "lack of training in effective communication" (42.2%; 95% CI: 35.3-48.7%) (Table 4).

Compared with other healthcare workers, physicians were 2.3 times more likely to report time constraints during consultations ($p = 0.003$), 1.9 times more likely to cite insufficient healthcare resources ($p = 0.035$), and 4.5 times more likely to report inadequate knowledge of weight management ($p < 0.001$). The comparison of perceived barriers to discussing weight management between physicians and other health-care workers is summarized in Figure 2.

Regarding the influence of experience and BMI, stratified analyses revealed that healthcare workers with ≥5 years of experience demonstrated significantly higher rates of lifestyle modification recommendations for mild obesity compared to those with less experience ($p < 0.001$) (Table S1). However, there were no significant differences in KAP outcomes across participants' own BMI status (Table S2).

DISCUSSION

This study provides valuable insights into the knowledge, attitudes and practices of healthcare workers in Vietnam regarding obesity management. While general awareness of obesity as a health issue was relatively high, fewer than half of the participants were aware of approved pharmacotherapies. Notably, only 63.8% identified obesity as a chronic disease. This recognition rate is lower than those reported in recent Malaysian (88%), Swedish (91%) and broader ASEAN studies (84%), highlighting a persistent regional gap in understanding the metabolic complexity of obesity.[14-17]

Regarding attitudes, although 87.4% believed they could help patients lose weight, over three-quarters believed that weight loss is primarily the patient's responsibility. This perception is consistent with a prior Vietnamese study in which 55% of healthcare workers endorsed the same view.[15] It is notably higher than the 41% reported in a regional study across South and Southeast Asia.[14] The finding that 79.7% of healthcare workers attribute weight loss to patient responsibility reflects implicit weight bias widely documented in healthcare settings. This perspective is incongruent with current pathophysiological understanding of obesity as a chronic disease with strong genetic and neurobiological components. To improve

obesity care, training must address and normalize the bio-psychosocial model of obesity.

Concern about obesity was not high among staff at Le Van Thinh Hospital; only 54.0% of physicians and 54.5% of other healthcare workers reported being highly concerned. To change entrenched and long-standing beliefs, a shift toward a new public narrative grounded in modern scientific knowledge is needed.[18]

An interesting observation was the shift in treatment recommendations based on obesity severity. The declining frequency of lifestyle modification recommendations (from 83.6% for BMI 25–30 to 72.4% for BMI 30–35) despite

Table 4. Practices of healthcare workers regarding obesity management

Survey Question	Total, n (%) (N = 232)	Physicians, n (%) (N = 87)	Other HCWs, n (%) (N = 145)	*p*-value
Management of patients with BMI 25–30 and no comorbidities				
1. Lifestyle modification	194 (83.6) [95% CI: 78.5-88.4%]	74 (85.1) [95% CI: 77.1-92.6%]	120 (82.8) [95% CI: 75.9-88.7%]	0.647*
2. Pharmacologic treatment	25 (10.8) [95% CI: 6.9-15.5%]	9 (10.3) [95% CI: 3.8-17.0%]	16 (11.0) [95% CI: 6.3-17.0%]	0.870*
3. Referral to obesity specialist	47 (20.3) [95% CI: 15.1-26.3%]	19 (21.8) [95% CI: 13.3-30.6%]	28 (19.3) [95% CI: 12.9-26.3%]	0.643*
4. No intervention	14 (6.0) [95% CI: 3.0-9.1%]	0 (0.0) -	14 (9.7) [95% CI: 5.2-15.1%]	0.003*
5. Do not know what to do	25 (10.8) [95% CI: 6.9-15.1%]	10 (11.5) [95% CI: 4.8-18.4%]	15 (10.3) [95% CI: 5.8-15.6%]	0.785*
Management of patients with BMI 30–35 and no comorbidities				
1. Lifestyle modification	168 (72.4) [95% CI: 66.4-78.0%]	64 (73.6) [95% CI: 63.9-83.0%]	104 (71.7) [95% CI: 64.2-78.6%]	0.762*
2. Pharmacologic treatment	81 (34.9) [95% CI: 28.5-40.9%]	32 (36.8) [95% CI: 26.4-47.9%]	49 (33.8) [95% CI: 26.3-41.8%]	0.644*
3. Referral to obesity specialist	137 (59.1) [95% CI: 52.6-65.5%]	57 (65.5) [95% CI: 54.8-76.0%]	80 (55.2) [95% CI: 47.2-63.2%]	0.121*
4. No intervention	6 (2.6) [95% CI: 0.9-4.7%]	1 (1.1) [95% CI: 0.0-4.2%]	5 (3.4) [95% CI: 0.7-6.7%]	0.414**
5. Do not know what to do	31 (13.4) [95% CI: 9.1-17.7%]	8 (9.2) [95% CI: 3.4-15.7%]	23 (15.9) [95% CI: 10.3-21.9%]	0.149*
Management of patients with BMI 27–35 and comorbidities (e.g., HTN, T2DM, dyslipidemia)				
1. Lifestyle modification	154 (66.4) [95% CI: 59.9-72.0%]	54 (62.1) [95% CI: 51.7-73.2%]	100 (69.0) [95% CI: 61.5-76.5%]	0.282*
2. Pharmacologic treatment	144 (62.1) [95% CI: 56.0-68.1%]	54 (62.1) [95% CI: 51.7-72.0%]	90 (62.1) [95% CI: 53.9-69.7%]	1.000*
3. Referral to obesity specialist	142 (61.2) [95% CI: 54.7-67.2%]	65 (74.7) [95% CI: 65.3-83.7%]	77 (53.1) [95% CI: 45.1-61.4%]	0.001*
4. No intervention	3 (1.3) [95% CI: 0.0-3.0%]	0 (0.0) -	3 (2.1) [95% CI: 0.0-4.8%]	0.294**
5. Do not know what to do	30 (12.9) [95% CI: 8.6-17.2%]	8 (9.2) [95% CI: 3.4-15.7%]	22 (15.2) [95% CI: 9.7-21.2%]	0.189*
Barriers in discussing weight management with obese patients				
1. Lack of patient motivation	186 (80.2) [95% CI: 75.4-85.3%]	73 (83.9) [95% CI: 75.8-92.0%]	113 (77.9) [95% CI: 70.8-84.9%]	0.269*
2. Lack of time during consultation	99 (42.7) [95% CI: 36.2-49.6%]	48 (55.2) [95% CI: 43.2-65.9%]	51 (35.2) [95% CI: 27.7-42.3%]	0.003*
3. Patient sensitivity about weight	133 (57.3) [95% CI: 50.9-63.4%]	50 (57.5) [95% CI: 47.1-67.4%]	83 (57.2) [95% CI: 49.3-65.7%]	0.973*
4. Lack of primary care resources	69 (29.7) [95% CI: 23.7-35.3%]	33 (37.9) [95% CI: 27.3-48.3%]	36 (24.8) [95% CI: 17.9-32.2%]	0.035*
5. Lack of training in effective weight-related communication	98 (42.2) [95% CI: 35.3-48.7%]	43 (49.4) [95% CI: 38.3-59.8%]	55 (37.9) [95% CI: 30.1-46.3%]	0.086*
6. Physicians' lack of knowledge about weight management	37 (15.9) [95% CI: 11.2-20.7%]	25 (28.7) [95% CI: 19.3-38.0%]	12 (8.3) [95% CI: 4.1-12.8%]	<0.001*
7. No barriers reported	7 (3.0) [95% CI: 0.9-5.2%]	4 (4.6) [95% CI: 1.1-9.5%]	3 (2.1) [95% CI: 0.0-4.8%]	0.430**
8. Not applicable / never discussed obesity with patients	18 (7.8) [95% CI: 4.3-11.2%]	5 (5.7) [95% CI: 1.1-11.1%]	13 (9.0) [95% CI: 4.7-13.8%]	0.375*

Respondents could select multiple options; percentages exceed 100%.*Pearson's Chi-square test; **Fisher's exact tests.

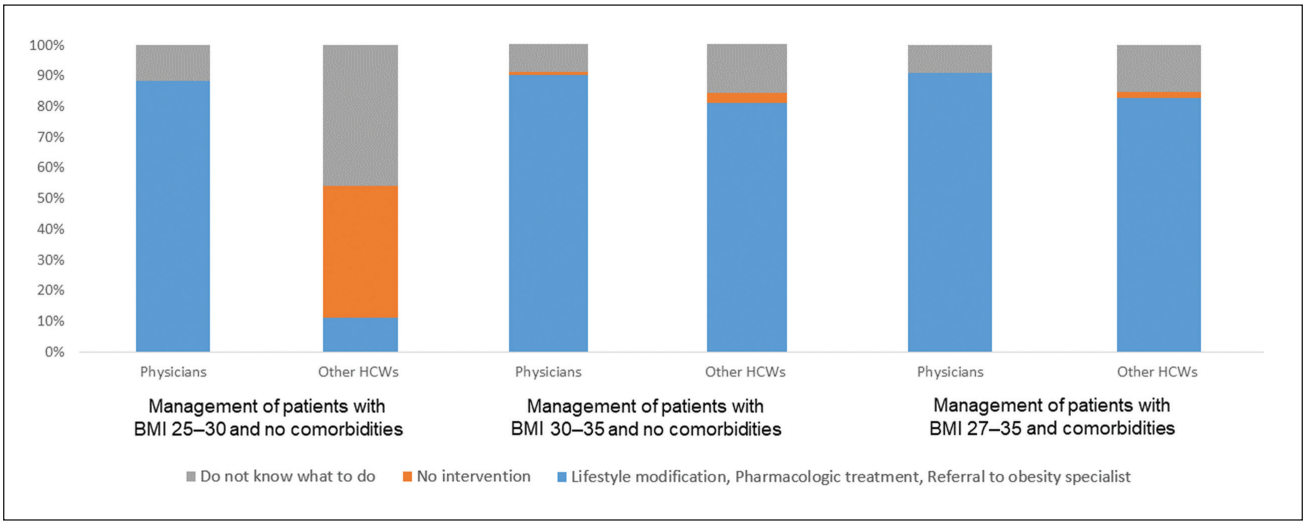

Figure 1. Treatment recommendations (lifestyle, pharmacotherapy, referral) across BMI categories, with separate bars for physicians vs. non-physicians.

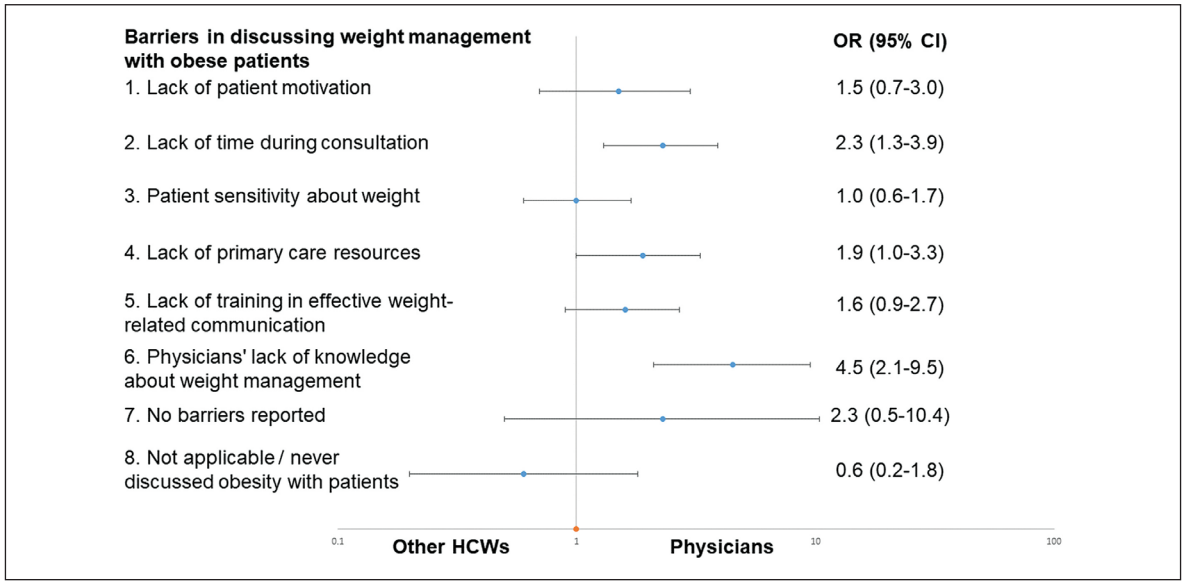

Figure 2. Forest plot of odds ratios and 95% CIs for barriers comparing physicians to other healthcare workers.

increasing metabolic dysfunction suggests potential therapeutic disbelief or uncertainty about the efficacy of pharmacotherapy. These findings align with studies from ASEAN countries, wherein, despite believing medications are effective, physicians rarely prescribe them.[19] This may reflect a lack of pharmacotherapy knowledge, potentially correlating with low confidence in obesity treatment. Although multidisciplinary care models have proven effective, they remain underutilized in Vietnam.

When analyzing barriers, we found that physicians were significantly more likely than other hospital staff to report inadequate knowledge in weight management. Interestingly, physicians reported greater knowledge insufficiency (4.5x higher odds) than other staff. This may reflect greater awareness of knowledge gaps following more formal training, or increased time constraints limiting the opportunity to maintain currency with rapidly evolving obesity treatment guidelines. Barriers in counseling patients about obesity were considerable: 80% cited lack of patient motivation and 57.3% mentioned patient sensitivity about weight. Additionally, 28% of physicians reported insufficient knowledge as a major barrier, along with limited time and resources—factors more frequently reported by physicians than by other staff. Similar barriers have been reported across Asia. A review of 26 studies identified common challenges among healthcare providers, including a lack of knowledge, inadequate specialized training and insufficient systemic support.[20] Therefore, targeted interventions to enhance provider knowledge and skills are essential. Integrated training programs that combine medical knowledge, patient-centered communication and practical tools may help improve the quality of care and reduce delays in obesity management.

Our stratified analysis revealed a significant association between clinical experience and obesity management. Healthcare workers with five or more years of experience demonstrated greater concern. They were more likely to recommend lifestyle modifications across various clinical scenarios than those with less than five years of experience. Notably, junior staff reported a significantly higher rate of uncertainty regarding appropriate interventions. This finding suggests that while fundamental knowledge may be acquired during formal education, the confidence and perceived importance of obesity management likely grow with clinical exposure and long-term patient interaction.

In contrast, the participants' own BMI status did not appear to significantly influence their knowledge, attitudes or clinical practices regarding obesity. This lack of association suggests that healthcare workers at Le Van Thinh Hospital generally maintain a professional approach to obesity care that is independent of their personal physical characteristics. This reinforces the idea that educational interventions and institutional protocols, rather than personal attributes, are the primary drivers of clinical decision-making in this setting.

To address these systemic and educational gaps, comprehensive system-level changes are required. Institutional interventions can include: (1) obesity medicine certification programs; (2) standardized screening and treatment protocols; (3) multidisciplinary care models with nutritionists, nurses, physiotherapists, and behavioral specialists; (4) electronic medical record (EMR) reminders for weight management; and (5) performance metrics linking obesity treatment to quality outcomes.

Although multidisciplinary care models have proven effective, they remain underutilized in Vietnam. To address this, an obesity specialty clinic was newly established at our institution in late 2023. However, within Vietnam's broader public hospital infrastructure, such dedicated units remain highly scarce. Obesity management is still mostly integrated into general endocrinology or nutrition

clinics rather than standalone centers. Furthermore, there is a lack of robust national data on the utilization rates at these specialized clinics, reflecting an urgent need for institutional investments in dedicated metabolic care models.

Limitations

This study has several limitations. First, the cross-sectional design reflects associations at a single point in time and does not establish causality among knowledge, attitudes and practices. Second, the use of convenience sampling during departmental meetings precludes the calculation of an exact response rate and may introduce selection bias. Although our sample predominantly consisted of nurses (53.9%) and internal medicine physicians (29.7%), which generally reflects the hospital's clinical workforce composition, some smaller clinical departments and surgical specialties may be under-represented, limiting the broader generalizability of the findings across all hospital sectors. Third, reliance on self-reported data may be subject to social desirability bias. Because our analysis involved multiple bivariate comparisons to explore associations between participant characteristics and various KAP domains, there is a potential for Type I error inflation. As no formal multiplicity adjustments were applied in this descriptive study, the statistically significant associations identified should be interpreted as exploratory and warrant confirmation in future adequately powered, hypothesis-driven research. While stratified analyses were performed to adjust for key confounders such as participant BMI and gender, full multivariable regression models were not utilized. The statistically significant associations identified in our bivariate comparisons should therefore be interpreted as exploratory. Finally, the study was conducted at a single hospital, which may not represent general trends across healthcare settings in Vietnam. Future research should include larger, geographically diverse samples and employ longitudinal designs to assess changes in perception and practice over time.

CONCLUSION

In conclusion, significant knowledge gaps and implicit weight biases persist among healthcare workers regarding obesity management. While this study was conducted at a single tertiary center, these findings highlight systemic educational barriers that likely extend across the national healthcare infrastructure. Addressing these gaps through specialized training, standardized protocols, and multi-disciplinary care models is not only critical for institutional improvement but also provides a vital framework for Vietnam and other ASEAN nations currently confronting similar rapid escalations in metabolic diseases.

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Statement of Authorship
The author certified fulfillment of ICMJE authorship criteria.

CRediT Author Statement
TT: Conceptualization, Methodology, Validation, Formal Analysis, Resources, Data curation, Writing – original draft preparation, Writing – review and editing.

Data Availability Statement
Datasets are not publicly available because participants in the study did not give written consent for their data to be shared.

Author Disclosure
The author declared no conflict of interest.

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SUPPLEMENTARY TABLES

Table S1. Attitudes and practices stratified by years of experience (<5 years vs. ≥5 years)

Survey question	Total, N (%)	<5 years experience, N (%)	≥5 years experience, N (%)	*p*-value
"Physicians can help patients lose weight in a healthy way"				
Agree	209 (90.1) [95% CI: 86.2-93.5%]	93 (86.9) [95% CI: 80.5-93.3%]	116 (92.8) [95% CI: 88.0-96.9%]	0.135*
Disagree	23 (9.9) [95% CI: 6.5-13.8%]	14 (13.1) [95% CI: 6.7-19.5%]	9 (7.2) [95% CI: 3.1-12.0%]	
"Weight loss is the patient's responsibility"				
Agree	185 (79.7) [95% CI: 75.0-84.9%]	82 (76.6) [95% CI: 68.6-84.4%]	103 (82.4) [95% CI: 74.8-89.4%]	0.276*
Disagree	47 (20.3) [95% CI: 15.1-25.0%]	25 (23.4) [95% CI: 15.6-31.4%]	22 (17.6) [95% CI: 10.6-25.2%]	
Would recommend obesity treatment if the patient has obesity with comorbidities				
Agree	217 (93.5) [95% CI: 90.1-96.6%]	97 (90.7) [95% CI: 85.0-96.3%]	120 (96.0) [95% CI: 92.2-99.2%]	0.099*
Disagree	15 (6.5) [95% CI: 3.4-9.9%]	10 (9.3) [95% CI: 3.7-15.0%]	5 (4.0) [95% CI: 0.8-7.8%]	
Would recommend obesity treatment if the patient has obesity without comorbidities				
Agree	195 (84.1) [95% CI: 79.3-88.4%]	84 (78.5) [95% CI: 70.8-86.5%]	111 (88.8) [95% CI: 83.3-94.6%]	0.033*
Disagree	37 (15.9) [95% CI: 11.6-20.7%]	23 (21.5) [95% CI: 13.5-29.2%]	14 (11.2) [95% CI: 5.4-16.7%]	
Level of concern about obesity in patients				
Very concerned	126 (54.3) [95% CI: 47.8-60.3%]	50 (46.7) [95% CI: 37.3-56.4%]	76 (60.8) [95% CI: 51.1-69.3%]	0.027*
Somewhat concerned	86 (37.1) [95% CI: 31.0-43.1%]	43 (40.2) [95% CI: 31.1-49.5%]	43 (34.4) [95% CI: 26.4-42.7%]	
Not concerned	20 (8.6) [95% CI: 5.2-12.1%]	14 (13.1) [95% CI: 6.4-19.6%]	6 (4.8) [95% CI: 1.5-8.8%]	
Management of patients with BMI 25–30 and no comorbidities				
1. Lifestyle modification	194 (83.6) [95% CI: 78.5-88.4%]	79 (73.8) [95% CI: 65.4-82.2%]	115 (92.0) [95% CI: 86.8-96.3%]	<0.001*
2. Pharmacologic treatment	25 (10.8) [95% CI: 6.9-15.5%]	11 (10.3) [95% CI: 5.0-16.8%]	14 (11.2) [95% CI: 6.0-17.1%]	0.822*
3. Referral to obesity specialist	47 (20.3) [95% CI: 15.1-26.3%]	13 (12.1) [95% CI: 5.6-18.9%]	34 (27.2) [95% CI: 19.5-35.0%]	0.004*
4. No intervention	14 (6.0) [95% CI: 3.0-9.1%]	7 (6.5) [95% CI: 2.4-11.6%]	7 (5.6) [95% CI: 1.8-12.0%]	0.764*
5. Do not know what to do	25 (10.8) [95% CI: 6.9-15.1%]	20 (18.7) [95% CI: 11.3-26.7%]	5 (4.0) [95% CI: 0.8-7.8%]	<0.001*
Management of patients with BMI 30–35 and no comorbidities				
1. Lifestyle modification	168 (72.4) [95% CI: 66.4-78.0%]	71 (66.4) [95% CI: 57.8-75.4%]	97 (77.6) [95% CI: 69.6-84.7%]	0.056*
2. Pharmacologic treatment	81 (34.9) [95% CI: 28.5-40.9%]	40 (37.4) [95% CI: 28.4-46.9%]	41 (32.8) [95% CI: 24.1-41.0%]	0.465*
3. Referral to obesity specialist	137 (59.1) [95% CI: 52.6-65.5%]	60 (56.1) [95% CI: 46.5-65.7%]	77 (61.6) [95% CI: 52.7-70.2%]	0.394*
4. No intervention	6 (2.6) [95% CI: 0.9-4.7%]	2 (1.9) [95% CI: 0.0-4.8%]	4 (3.2) [95% CI: 0.7-6.6%]	0.689**
5. Do not know what to do	31 (13.4) [95% CI: 9.1-17.7%]	19 (17.8) [95% CI: 10.4-25.0%]	12 (9.6) [95% CI: 4.7-15.3%]	0.069*
Management of patients with BMI 27–35 and comorbidities (e.g., HTN, T2DM, dyslipidemia)				
1. Lifestyle modification	154 (66.4) [95% CI: 60.3-72.8%]	60 (56.1) [95% CI: 46.5-65.1%]	94 (75.2) [95% CI: 67.4-83.2%]	0.002*
2. Pharmacologic treatment	144 (62.1) [95% CI: 56.0-68.1%]	61 (57.0) [95% CI: 47.7-66.1%]	83 (66.4) [95% CI: 57.6-75.0%]	0.142*
3. Referral to obesity specialist	142 (61.2) [95% CI: 54.7-67.2%]	66 (61.7) [95% CI: 52.8-71.4%]	76 (60.8) [95% CI: 51.9-69.2%]	0.891*
4. No intervention	3 (1.3) [95% CI: 0.0-3.0%]	1 (0.9) [95% CI: 0.0-3.0%]	2 (1.6) [95% CI: 0.0-3.9%]	1.000**
5. Do not know what to do	30 (12.9) [95% CI: 8.6-17.2%]	19 (17.8) [95% CI: 10.4-25.0%]	11 (8.8) [95% CI: 4.0-14.0%]	0.043*
Barriers in discussing weight management with obese patients				
1. Lack of patient motivation	186 (80.2) [95% CI: 75.4-85.3%]	85 (79.4) [95% CI: 71.3-87.1%]	101 (80.8) [95% CI: 73.8-87.6%]	0.796*
2. Lack of time during consultation	99 (42.7) [95% CI: 36.2-49.6%]	50 (46.7) [95% CI: 37.7-55.6%]	49 (39.2) [95% CI: 30.5-48.1%]	0.248*
3. Patient sensitivity about weight	133 (57.3) [95% CI: 50.9-63.4%]	60 (56.1) [95% CI: 46.9-65.4%]	73 (58.4) [95% CI: 49.5-66.7%]	0.721*
4. Lack of primary care resources	69 (29.7) [95% CI: 23.7-35.3%]	32 (29.9) [95% CI: 21.4-38.7%]	37 (29.6) [95% CI: 21.9-37.8%]	0.959*
5. Lack of training in effective weight-related communication	98 (42.2) [95% CI: 35.3-48.7%]	46 (43.0) [95% CI: 34.2-52.6%]	52 (41.6) [95% CI: 32.5-50.4%]	0.831*
6. Physicians' lack of knowledge about weight management	37 (15.9) [95% CI: 11.2-20.7%]	18 (16.8) [95% CI: 10.1-24.3%]	19 (15.2) [95% CI: 8.8-21.3%]	0.737*
7. No barriers reported	7 (3.0) [95% CI: 0.9-5.2%]	3 (2.8) [95% CI: 0.0-6.3%]	4 (3.2) [95% CI: 0.8-6.6%]	1.000**
8. Not applicable / never discussed obesity with patients	18 (7.8) [95% CI: 4.3-11.2%]	10 (9.3) [95% CI: 4.0-15.3%]	8 (6.4) [95% CI: 2.3-11.4%]	0.403*

Respondents could select multiple options; percentages exceed 100%.*Pearson's Chi-square test; **Fisher's exact tests.

Table S2. Relationship between participant BMI status and obesity attitudes/practices

Survey question	Total, N (%)	Underweight / normal weight HCWs, N (%)	Overweight / obese HCWs, N (%)	*p*-value
"Physicians can help patients lose weight in a healthy way"				
Agree	209 (90.1) [95% CI: 86.2-93.5%]	115 (89.1) [95% CI: 83.7-94.7%]	94 (91.3) [95% CI: 84.8-96.4%]	0.592*
Disagree	23 (9.9) [95% CI: 6.5-13.8%]	14 (10.9) [95% CI: 5.3-16.3%]	9 (8.7) [95% CI: 3.6-15.2%]	
"Weight loss is the patient's responsibility"				
Agree	185 (79.7) [95% CI: 75.0-84.9%]	102 (79.1) [95% CI: 72.1-85.7%]	83 (80.6) [95% CI: 72.3-88.0%]	0.776*
Disagree	47 (20.3) [95% CI: 15.1-25.0%]	27 (20.9) [95% CI: 14.3-27.9%]	20 (19.4) [95% CI: 12.0-27.7%]	
Would recommend obesity treatment if the patient has obesity with comorbidities				
Agree	217 (93.5) [95% CI: 90.1-96.6%]	121 (93.8) [95% CI: 89.4-97.7%]	96 (93.2) [95% CI: 88.0-97.7%]	0.855*
Disagree	15 (6.5) [95% CI: 3.4-9.9%]	8 (6.2) [95% CI: 2.3-10.6%]	7 (6.8) [95% CI: 2.3-12.0%]	
Would recommend obesity treatment if the patient has obesity without comorbidities				
Agree	195 (84.1) [95% CI: 79.3-88.4%]	105 (81.4) [95% CI: 74.4-88.1%]	90 (87.4) [95% CI: 80.7-94.0%]	0.216*
Disagree	37 (15.9) [95% CI: 11.6-20.7%]	24 (18.6) [95% CI: 11.9-25.6%]	13 (12.6) [95% CI: 6.0-19.3%]	
Level of concern about obesity in patients				
Very concerned	126 (54.3) [95% CI: 47.8-60.3%]	65 (50.4) [95% CI: 41.6-58.8%]	61 (59.2) [95% CI: 50.0-68.6%]	0.365*
Somewhat concerned	86 (37.1) [95% CI: 31.0-43.1%]	51 (39.5) [95% CI: 31.6-48.8%]	35 (34.0) [95% CI: 24.8-43.2%]	
Not concerned	20 (8.6) [95% CI: 5.2-12.1%]	13 (10.1) [95% CI: 5.1-16.0%]	7 (6.8) [95% CI: 2.1-12.4%]	
Management of patients with BMI 25–30 and no comorbidities				
1. Lifestyle modification	194 (83.6) [95% CI: 78.5-88.4%]	104 (80.6) [95% CI: 74.0-87.0%]	90 (87.4) [95% CI: 80.9-93.8%]	0.167*
2. Pharmacologic treatment	25 (10.8) [95% CI: 6.9-15.5%]	12 (9.3) [95% CI: 4.5-14.2%]	13 (12.6) [95% CI: 6.9-19.1%]	0.418*
3. Referral to obesity specialist	47 (20.3) [95% CI: 15.1-26.3%]	25 (19.4) [95% CI: 12.6-26.8%]	22 (21.4) [95% CI: 13.7-29.0%]	0.709*
4. No intervention	14 (6.0) [95% CI: 3.0-9.1%]	9 (7.0) [95% CI: 3.1-11.1%]	5 (4.9) [95% CI: 1.1-9.4%]	0.500*
5. Do not know what to do	25 (10.8) [95% CI: 6.9-15.1%]	18 (14.0) [95% CI: 8.2-20.7%]	7 (6.8) [95% CI: 2.0-11.9%]	0.081*
Management of patients with BMI 30–35 and no comorbidities				
1. Lifestyle modification	168 (72.4) [95% CI: 66.4-78.0%]	90 (69.8) [95% CI: 60.8-77.5%]	78 (75.7) [95% CI: 67.3-84.0%]	0.313*
2. Pharmacologic treatment	81 (34.9) [95% CI: 28.5-40.9%]	47 (36.4) [95% CI: 28.3-44.4%]	34 (33.0) [95% CI: 24.7-42.3%]	0.587*
3. Referral to obesity specialist	137 (59.1) [95% CI: 52.6-65.5%]	78 (60.5) [95% CI: 51.6-68.6%]	59 (57.3) [95% CI: 47.6-66.7%]	0.624*
4. No intervention	6 (2.6) [95% CI: 0.9-4.7%]	3 (2.3) [95% CI: 0.0-5.3%]	3 (2.9) [95% CI: 0.0-6.6%]	1.000**
5. Do not know what to do	31 (13.4) [95% CI: 9.1-17.7%]	21 (16.3) [95% CI: 10.4-23.3%]	10 (9.7) [95% CI: 4.0-15.5%]	0.144*
Management of patients with BMI 27–35 and comorbidities (e.g., HTN, T2DM, dyslipidemia)				
1. Lifestyle modification	154 (66.4) [95% CI: 60.3-72.8%]	86 (66.7) [95% CI: 57.6-74.8%]	68 (66.0) [95% CI: 56.1-75.5%]	0.917*
2. Pharmacologic treatment	144 (62.1) [95% CI: 56.0-68.1%]	81 (62.8) [95% CI: 53.3-70.8%]	63 (61.2) [95% CI: 51.5-70.2%]	0.800*
3. Referral to obesity specialist	142 (61.2) [95% CI: 54.7-67.2%]	77 (59.7) [95% CI: 51.2-67.8%]	65 (63.1) [95% CI: 53.1-72.5%]	0.596*
4. No intervention	3 (1.3) [95% CI: 0.0-3.0%]	2 (1.6) [95% CI: 0.0-4.1%]	1 (1.0) [95% CI: 0.0-3.3%]	1.000**
5. Do not know what to do	30 (12.9) [95% CI: 8.6-17.2%]	21 (16.3) [95% CI: 10.2-22.9%]	9 (8.7) [95% CI: 3.5-14.1%]	0.089*
Barriers in discussing weight management with obese patients	232 (100.0)	129 (100.0)	103 (100.0)	
1. Lack of patient motivation	186 (80.2) [95% CI: 75.4-85.3%]	104 (80.6) [95% CI: 73.2-86.9%]	82 (79.6) [95% CI: 71.3-87.2%]	0.848*
2. Lack of time during consultation	99 (42.7) [95% CI: 36.2-49.6%]	54 (41.9) [95% CI: 33.9-50.8%]	45 (43.7) [95% CI: 34.0-53.3%]	0.780*
3. Patient sensitivity about weight	133 (57.3) [95% CI: 50.9-63.4%]	77 (59.7) [95% CI: 51.5-68.5%]	56 (54.4) [95% CI: 44.9-63.2%]	0.416*
4. Lack of primary care resources	69 (29.7) [95% CI: 23.7-35.3%]	43 (33.3) [95% CI: 24.6-41.3%]	26 (25.2) [95% CI: 16.8-34.4%]	0.180*
5. Lack of training in effective weight-related communication	98 (42.2) [95% CI: 35.3-48.7%]	56 (43.4) [95% CI: 34.5-52.4%]	42 (40.8) [95% CI: 31.7-50.5%]	0.687*
6. Physicians' lack of knowledge about weight management	37 (15.9) [95% CI: 11.2-20.7%]	26 (20.2) [95% CI: 13.2-27.5%]	11 (10.7) [95% CI: 5.1-17.4%]	0.050*
7. No barriers reported	7 (3.0) [95% CI: 0.9-5.2%]	4 (3.1) [95% CI: 0.7-6.6%]	3 (2.9) [95% CI: 0.0-6.4%]	1.000**
8. Not applicable / never discussed obesity with patients	18 (7.8) [95% CI: 4.3-11.2%]	11 (8.5) [95% CI: 4.2-13.7%]	7 (6.8) [95% CI: 2.2-11.9%]	0.624*

Respondents could select multiple options; percentages exceed 100%.*Pearson's Chi-square test; **Fisher's exact tests.