

# Knowledge and Training Needs of Primary Healthcare Physicians Regarding Obesity Management in Saudi Arabia: A Systematic Review

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## Abstract

**Background/Objectives:** Obesity has surged globally, posing various health risks. Its prevalence and management, especially in primary health care settings in Saudi Arabia, have recently been under the spotlight. This research synthesized various studies, analyzing the knowledge and preparedness of primary health care physicians in addressing and management of obesity in Saudi Arabia. **Methods:** An exhaustive evaluation of studies spanning different regions of Saudi Arabia, focusing on physicians' capabilities, knowledge, and practices in obesity management. This analysis also took into account the comparative approaches of countries like Canada, the UK, USA, and Hungary. Various factors, such as specialized obesity treatments, patient-centric approaches in pediatric obesity, career stages of physicians, obesity's correlation with noncommunicable diseases, and nutritional competence, were studied. **Results:** Nine studies were included. From a collective pool of 2430 participants across the discussed studies, challenges in obesity management were consistent. Despite having an understanding of obesity, there was a significant knowledge gap in specialized treatments, with many physicians feeling unprepared to manage the condition. Factors such as geographical diversity, physicians' experiences, external influences on pediatric obesity management, and the correlation between obesity and other health conditions were highlighted. The need for effective nutrition care, despite perceived capability, was a notable finding. **Conclusion:** Saudi Arabia faces a significant challenge in obesity management in primary health care settings, marked by knowledge gaps and the need for continuous training. The analyzed studies emphasize the importance of tailored interventions, robust training modules, and public health campaigns within Saudi Arabia's unique context to combat the obesity epidemic effectively.

**Keywords:** Obesity Management; Primary Care; Knowledge and Training; Physicians; Saudi Arabia; Systematic review.

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## INTRODUCTION

Obesity rates are on the rise globally, posing a significant health challenge worldwide. Data from the Public Health Agency of Sweden indicates that the percentage of people aged 16–84 who are overweight or obese rose from 46% to 52% between 2006 and 2020. In Sweden, obesity is identified as one of the top five factors leading to a reduction in years of healthy living [1-3].

The worldwide surge in obesity prevalence over the past few decades has become a major public health concern. Globally, its incidence has nearly tripled since 1975, highlighting an alarming trend that

crosses borders and cultures [4]. One region that has been particularly affected is the Middle East, with Saudi Arabia witnessing a disproportionate increase in obesity rates among its population. A study published in 2014 pointed out that over 28% of the Saudi Arabian population was classified as obese [5], positioning the country among those with the highest obesity prevalence rates in the world.

Obesity results from an imbalanced obesogenic setting and is most effectively addressed through broad environmental changes, bolstered by suitable policies and laws. Combining obesity treatments with regulatory and economic strategies

proves to be highly cost-effective. Established clinical protocols show significant effectiveness, especially in areas like diet guidance, exercise, behavioral changes, and drug treatments. Patients with obesity who receive weight loss advice tend to be more prepared to shed pounds [6].

Obesity is closely linked to a plethora of non-communicable diseases including type 2 diabetes, cardiovascular diseases, and certain types of cancers, all of which can significantly diminish an individual's quality of life and increase mortality risk [7]. Additionally, the economic impact cannot be overstated. From direct medical costs to loss of productivity, the financial burden of obesity on healthcare systems and economies at large is staggering [8].

Primary healthcare physicians, being at the forefront of clinical practice, have a unique vantage point when it comes to addressing obesity. Their interactions with patients often form the first line of defense, offering opportunities for early identification, education, intervention, and long-term management of this condition [9]. Yet, their efficacy in this role heavily depends on their level of expertise and training in obesity management.

In Saudi Arabia, where cultural, societal, and dietary shifts have heavily influenced the rise in obesity, understanding the preparedness and capacity of primary healthcare physicians becomes even more pivotal [10]. These practitioners often grapple with challenges like evolving clinical guidelines, societal perceptions about obesity, and the need for multidisciplinary collaboration for comprehensive patient care.

There's an emerging consensus among health experts about potential knowledge and training deficits among primary healthcare providers in Saudi Arabia with respect to obesity management. Addressing these deficits can be instrumental in reshaping the trajectory of the obesity epidemic in the country. This systematic review seeks to delve deeper into this aspect by aggregating and critically evaluating the existing literature. The aim is to present a clear picture of the current knowledge and training landscape, thereby laying the groundwork for future interventions to bolster the healthcare system's response to the obesity challenge.

### Obesity Management Strategies:

Managing obesity requires a comprehensive, multi-faceted approach that addresses the underlying causes and contributes to sustainable weight loss while also mitigating associated health risks. Effective management often combines dietary, physical activity, behavioral, pharmacological, and surgical interventions, tailored to an individual's specific needs and

circumstances. Here, we will delve into some of the most endorsed strategies in obesity management:

1. **Dietary Interventions:** A balanced, calorie-controlled diet is foundational in obesity management. There's a consensus that reducing calorie intake, regardless of the dietary macronutrient composition, is effective for weight loss [11]. The Mediterranean, DASH (Dietary Approaches to Stop Hypertension), and low-carbohydrate diets have all shown efficacy in promoting weight loss and improving cardiovascular risk factors [12].
2. **Physical Activity:** Regular physical activity complements dietary interventions by increasing energy expenditure, maintaining muscle mass during weight loss, and enhancing cardiovascular health. The World Health Organization recommends at least 150 minutes of moderate-intensity aerobic physical activity throughout the week for adults [13].
3. **Behavioral Interventions:** Cognitive-behavioral therapy (CBT) can help address the psychological dimensions of obesity, assisting individuals in understanding and modifying their eating behaviors and physical activity patterns. Behavioral strategies also encompass stress reduction, improving sleep hygiene, and building self-monitoring habits [14].
4. **Pharmacotherapy:** Several FDA-approved medications, such as orlistat, liraglutide, and bupropion-naltrexone, can be used alongside lifestyle interventions for patients with significant obesity or those with comorbid conditions. It's crucial to consider the side-effects profile and patient preferences when prescribing these medications [15].
5. **Surgical Interventions:** Bariatric surgery, including procedures like gastric bypass and sleeve gastrectomy, may be considered for individuals with severe obesity (BMI > 40) or those with a BMI > 35 with related comorbidities. Such procedures have shown to result in substantial weight loss and improvements in obesity-related conditions, including type 2 diabetes [16].

Implementing a combination of these strategies, tailored to individual needs and circumstances, offers the best chance of success in managing obesity. Collaborative care, involving dietitians, physical therapists, psychologists, and medical specialists, can provide a holistic and integrated approach to treatment.

## METHODOLOGY

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines was followed for this systematic review.

**Study Design and Duration:** This was a systematic review conducted on August 2023.

### Search strategy

To retrieve the relevant research, a thorough search was conducted across five major databases, including Google Scholar, PubMed, Web of Science, Science Direct, and EBSCO. We only searched in English and take into account each database's unique criteria. The following keywords were converted into PubMed Mesh terms and used to find studies that were related; "Obesity Management," "Physicians," "Knowledge and training," and "Primary Health Care." The Boolean operators "OR" and "AND" matched the required keywords. Among the search results were publications in full English language, freely available articles, and human trials.

## SELECTION CRITERIA

### Inclusion criteria

We considered the following criteria for inclusion in this review:

- Any study designs that investigate knowledge and preparedness of primary health care physicians in addressing and management of obesity in Saudi Arabia.
- No age limits were restricted.
- Free accessible articles.

### Exclusion criteria

- We excluded patients with CD and associated systemic neuropsychiatric disorders.
- We excluded patients with CD and associated metabolic disorders (e.g., Diabetes mellitus).
- Case reports, letters to the editors, and replies to conflicts were excluded.
- Non-English language.

### Data extraction

Duplicates in the search strategy output were found using Rayyan (QCRI) [17]. To determine the titles' and abstract relevance, the researchers used a set of inclusion/exclusion criteria to filter the combined search results. The reviewers carefully read each paper that matches the requirements for inclusion. The authors provided other methods of resolving disputes with some thought. The authors extracted data about the study titles, authors, study year, country, participants, gender, diagnostic tool, main outcomes, and conclusion.

### Strategy for data synthesis

Summary tables were created using information from pertinent research to give a qualitative overview of the results and study components. Following data extraction for the systematic review, the most effective strategy for utilizing data from the included study articles was selected.

### Risk of bias assessment

Using the ROBINS-I risk of bias assessment approach for non-randomized trials of therapies, the included studies' quality was assessed [18]. The seven themes that were assessed were confounding, participant selection for the study, classification of interventions, deviations from intended interventions, missing data, assessment of outcomes, and choosing of the reported result.

## RESULTS

### Search Results

A total of 490 study articles resulted from the systematic search, and 53 duplicates were deleted. Title and abstract screening were conducted on 437 studies, and 390 studies were excluded. Forty-seven reports were sought for retrieval, and only 7 articles were not retrieved. Finally, 40 studies were screened for full-text assessment; 25 were excluded for wrong study outcomes, and 6 for the wrong population type. Nine eligible study articles were included in this systematic review. A summary of the study selection process is presented in Figure 1.

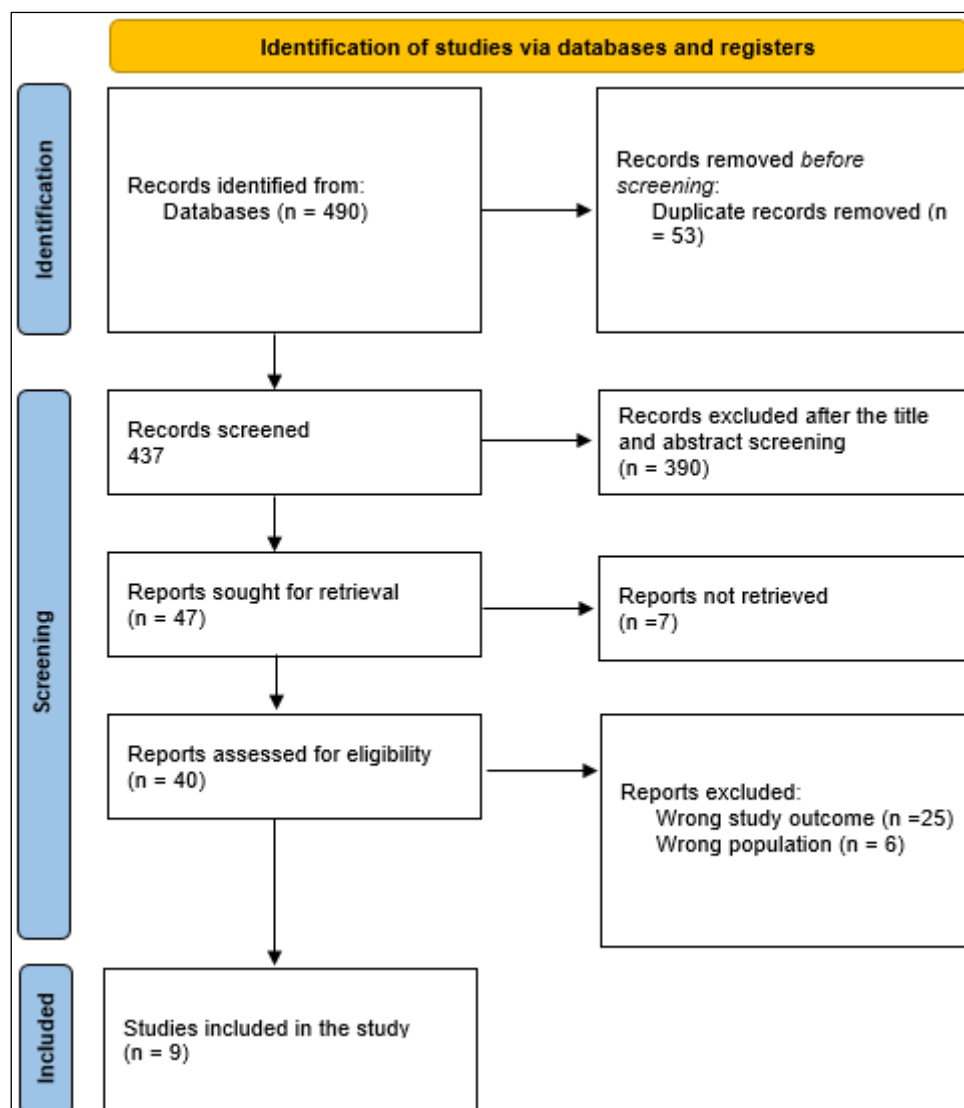
### Characteristics of the Included Studies

Table 1 presents the sociodemographic characteristics and study designs of the included research. Our compilation encompasses nine studies with a combined total of 1714 primary health care physicians in eight studies [1, 21-27] and other 716 participants in one study [20]. The proportion of male participants across the studies fluctuated, with an average hovering around 50% [19-27]. All investigations were carried out in diverse regions of Saudi Arabia, such as Jazan [19], Riyadh [21], Makkah [22], Jeddah [23], the Northern [24] and Eastern [25] regions, and cities including Dammam and Al-Khobar [27]. Most adopted a cross-sectional design [19-20, 22-27], while one was both analytical and retrospective [21]. The age of participants spanned a broad range, with certain studies detailing specific ranges, such as 25 to 61 years [27], and others mentioning a mean age or omitting age data entirely [19-26].

Table 2 Presents the clinical characteristics of the included studies:

A recurring finding across the studies by Ahmed AE and Awadallah SM [19], Alotaibi, F. [21], Sebiany AM [25], Al-Shammari YF [27], and Alsaati, O., & Almasaodi, K. [22] is the view of physicians feeling unqualified or ill-equipped to manage obesity, irrespective of their educational backgrounds. While Ahmed AE and Awadallah's [19] study pointed to gaps in skills among physicians of different qualifications, Alotaibi's [21] work emphasized a significant challenge in managing childhood obesity due to barriers like patient motivation and insufficient parental involvement. This sense of inadequacy was echoed by Sebiany AM [25] and Al-Shammari YF [27], who found that many physicians, despite recognizing the

importance of their role in obesity management, felt insufficiently prepared to tackle it.



**Figure 1: PRISMA flowchart summarizes the study selection process**

Knowledge gaps, identified by Algarni MA [20], Alenezi AM [24], and Sebiyani AM [25], showed that awareness regarding Weight Management Medications and bariatric surgery among both the general population and physicians was notably low. Interestingly, while the general populace in Algarni MA's [20] study had a strong understanding of traditional weight loss methods like diet and exercise, their familiarity with specific weight management medications was limited. Alenezi AM's [24] study further highlighted the impact of this knowledge gap, suggesting that it may lead to referral barriers among physicians regarding bariatric surgery.

Training deficits were a consistent theme across the board. The study by Alsaati, O., & Almasaodi, K. [22] found that a majority of family medicine candidates in Makkah recognized their lack of training as a significant obstacle in obesity

management. This sentiment was similarly captured by Sebiyani AM [25] and Al-Shammari YF [27], who both highlighted a dire need for enhanced education and training in the realm of obesity.

Al-Gassimi *et al.*, [23] took a slightly different angle, evaluating the nutritional competence of primary care physicians. They discovered that while these physicians felt capable of delivering nutrition care, the actual provision was minimal, reflecting the overarching theme of confidence versus competence in the broader context of obesity management.

In comparing these studies, there's a clear convergence on the challenges faced by healthcare professionals in Saudi Arabia when it comes to obesity management. These challenges span across knowledge, attitudes, training, and practical barriers. The collective findings underscore the pressing need for

comprehensive and tailored training programs, better resources, and public health initiatives to empower

physicians and bridge the existing gaps in obesity management.

**Table 1: Sociodemographic characteristics of the included participants**

Study	Study design	Location	Participants	Age range (mean) in years	Males (%)
Ahmed AE, Awadallah SM, 2017 [19]	Analytic cross-sectional	Jazan Region, KSA	224 PHP	-	52.9%
Algarni MA, 2023 [20]	Cross-sectional study	All regions of Saudi Arabia	716 Participants	33	38%
Alotaibi, F., 2017. [21]	Analytic, Observational, Retrospective	Riyadh	58 PHP	-	60%
Alsaati, O., & Almasaodi, K. (2020) [22]	Cross-sectional	Makkah	116 PHP	25 to 34	41.4%
Al-Gassimi O <i>et al.</i> , 2020 [23]	Cross-sectional study.	Jeddah	90 PHP	26 to 44	37%
Alenezi AM, 2022 [24]	Analytical cross-sectional study	Northern KSA	240 PHP	31-44	58.6%
Sebiany AM. 2013 [25]	Cross-sectional study.	Eastern KSA	130 PHP	-	53.8%
Alomary <i>et al.</i> , [26]	Cross-sectional Study.	KSA	707 PHP	-	-
Al-Shammari YF. 2014 [27]	Cross-sectional study.	Dammam and Al-Khobar	149 PHP	25 to 61 years (40.77)	53.6%

*PHP\*: Primary Healthcare Physicians*

**Table 2: Clinical characteristics and outcomes of the included studies**

Study	Methodology & Objective	Outcomes	Conclusion
Ahmed AE, Awadallah SM, 2017. [19]	To investigate the management practices and barriers related to obesity among primary health care centers' physicians in Jazan, Saudi Arabia. Methodology: A cross-sectional study was conducted from March 2017 to May 2018. Self-administered questionnaires were distributed to 240 primary health care physicians.	<ul style="list-style-type: none"> <li>- A large portion of the physicians felt unqualified in managing obesity, irrespective of their educational background.</li> <li>- Gaps in obesity management skills varied among physicians with different qualifications like MBBS, Diploma, Master's degree, and Board, but the differences weren't statistically significant.</li> <li>- Common barriers in obesity management, regardless of qualifications, were lack of time and training. About 36% of the physicians had no experience in obesity management, 21% found referral arrangements challenging, and 18% faced difficulties in dietary management.</li> <li>- Only 20.4% of physicians attended training courses in obesity management, and a mere 6.3% rated their experience as excellent. Most (67.5%) felt their expertise was good.</li> <li>- Common issues during obesity treatment were poor patient adherence to medical advice (62%) and ineffective behavioral therapy (23%).</li> <li>- If they chose to medicate, most physicians preferred prescribing Orlistat (53%) or Metformin (40%) for obesity management.</li> </ul>	primary care physicians might not be sufficiently informing their patients about all the viable and potent treatments for obesity. Continuous training aimed at bridging the knowledge gaps among PCPs in obesity management should encompass areas like motivational dialogues, nutrition advice, weight loss surgeries, and drug-based treatments. Furthermore, integrating additional resources, like having an in-house registered dietician in primary care settings, could significantly empower the treatment process.
Algarni MA, 2023. [20]	The study aimed to gauge the understanding of and sentiments toward Weight Management	Of the 716 respondents, the majority recognized diet (78.9%) and exercise (86.7%) as effective weight loss strategies,	there exists a knowledge gap and reservations regarding WMMs among

Study	Methodology & Objective	Outcomes	Conclusion
	Medications (WMMs) within the general populace of Saudi Arabia and identify factors that might influence these perceptions. To achieve this, a cross-sectional survey was carried out from January to May 2023, engaging adult participants. They were prompted to fill an electronic questionnaire in Arabic, capturing a spectrum of information from demographics to specific knowledge and viewpoints on WMMs.	while only 31% were aware of weight management medications (WMMs). The most recognized WMMs were semaglutide (33%) and liraglutide (31.8%). Most participants held skeptical views on the efficacy, safety, and convenience of WMMs. About 74.6% believed these medications needed expert guidance. Knowledge about WMMs was significantly influenced by factors like age, income, education, psychiatric history, and prior use, with those aged 26-35, earning more than 20K SAR, and past users of WMMs having better knowledge. Prior WMM use also correlated with positive attitudes.	Saudis, despite obesity being a significant issue. The data suggests that prior exposure to these medications leads to enhanced understanding and more positive views, highlighting a potential avenue for public health initiatives to bolster awareness and safe application.
<b>Alotaibi, F., 2017. [21]</b>	Objective: The primary goal of the study was to evaluate Primary Health Care (PHC) Physicians' perspectives on managing overweight and obesity in children and adolescents. Methods: The study involved PHC services from eight public hospitals in Riyadh. A self-administered questionnaire was used, ensuring anonymity, to evaluate the facilitators and barriers that PHC physicians face when managing overweight or obese children and adolescents.	53% had less than 10 years, 35.9% between 10 to 20 years, and 12.1% had over 20 years. Regarding their clinical approach, 51.7% of the respondents were identified as having appropriate practices in managing childhood and adolescent obesity. Two major barriers emerged from the survey: a lack of patient motivation (82.2%) and insufficient parental involvement (70.7%). Notably, physicians with appropriate practices showcased distinctive behaviors compared to their counterparts. They were more likely to attend continuous education sessions, refer patients to specialists, and were more convinced about the efficacy of interventions. These physicians were also more comfortable examining obese patients, showed minimal concerns about triggering eating disorders, and often considered a patient's readiness to change their weight.	While a significant portion of physicians demonstrates adeptness in obesity management, barriers such as patient motivation and parental involvement remain prevalent challenges. The clear distinctions between physicians with appropriate practices and their counterparts highlight the need for ongoing education, patient-centered approaches, and increased parental engagement to enhance the efficacy of obesity management in the youth population
<b>Alsaati, O., &amp; Almasaodi, K. (2020) [22]</b>	To explore the knowledge, attitudes, and practices of the joint program of family medicine candidates in Makkah regarding obesity management. Data collection was done using a self-administered validated questionnaire. The questionnaire comprised four primary sections: sociodemographic data, questions related to knowledge, attitude-related statements, and practice-related statements. The main goal was to explore the knowledge, attitudes, and practices of family medicine candidates in Makkah concerning obesity management.	Obesity was noted in 13.8% of the participants, divided between class I (8.6%) and class II (5.2%). Over half (51.7%) had attended an obesity-related course or workshop. Regarding their understanding of obesity management, 57.8% displayed a good level of knowledge, with PGY 2 residents leading (73.5%) and PGY 1 trailing (28.6%). Positive attitudes towards obesity management were seen in 54.3% of participants, growing with residency level and experience. 61.2% showed adequate practices in obesity management, with obese residents reporting higher adequacy. The primary challenges faced included lack of training (47.4%), knowledge (45.7%), effective referral systems (39.7%), and time (38.8%).	The family medicine residents in Makkah have a moderate understanding, favorable outlook, and sufficient practice concerning obesity management, though there are areas that need improvement.
<b>Al-Gassimi O, et al., 2020. [23]</b>	This study aimed to evaluate the nutritional competence of primary care physicians in KSA, particularly their ability to guide patients with diet-related chronic diseases. Using a cross-sectional design, the study surveyed 90 primary care physicians from 48	Primary care doctors felt capable in delivering nutrition care, though actual provision was limited. Their confidence in nutrition knowledge and abilities scored an average of 25.8 out of 35 and 29 out of 40. The extent of nutrition care given was strongly linked to their confidence in knowledge and communication. Key	Primary care doctors believe they can effectively offer nutrition care to patients with diet-associated chronic ailments. Enhancing their nutrition knowledge and abilities would allow

Study	Methodology & Objective	Outcomes	Conclusion
	clinics in Jeddah.	predictors for providing nutrition care included their confidence in nutrition counseling, prior nutrition education, and advanced professional credentials.	them to better assist patients in improving their eating habits and overall health, contributing to better public health outcomes.
<b>Alenezi AM, 2022. [24]</b>	This analytical cross-sectional study assessed the knowledge, attitudes, and potential referral barriers of 280 primary care physicians toward bariatric surgery, using a validated data collection tool. Associations between sociodemographic factors and scores in knowledge, attitude, and referral barriers were analyzed	Over half of the physicians (52.9%) exhibited low knowledge about bariatric surgery, with 19.3% showing low attitude scores and 59.3% facing referral barriers. Attitudes were linked to education status and current roles at health centers, while referral barriers correlated with work experience. A positive correlation existed between knowledge and attitude, while a negative one was found between knowledge and referral barriers.	The study highlights a notable knowledge gap concerning bariatric surgery among physicians, leading to concerns and barriers in referrals. Enhancing physician education on obesity care is crucial, and broader regional studies in KSA are recommended to identify specific educational needs.
<b>Sebiany AM. 2013. [25]</b>	To evaluate the understanding of primary health care doctors in addressing overweight and obesity in Saudi Arabia's Eastern Province. A survey was conducted involving 149 physicians. An anonymous, self-filled questionnaire, boasting a reliability score (Cronbach alpha) of 0.85 and content validated by five experts, was employed to gauge their knowledge and perceived challenges in treating overweight and obese patients.	Out of the surveyed physicians, 130 (87%) responded. A majority viewed themselves as pivotal in obesity management. However, only a third felt sufficiently equipped to address obesity. A notable 83% exhibited a negative perception towards overweight and obesity. Around 76.9% suggested weight management through exercise and a low-calorie diet. 60% diagnosed obesity based on body mass index, while 72% refrained from prescribing weight-reducing drugs. Identified challenges included inadequate training, lack of administrative backing, and time limitations.	Participants recognized the significance of overweight and obesity as critical public health concerns in Saudi Arabia. They were also conversant with the accurate definitions and the associated increased mortality risks. However, enhanced training is necessary to refine awareness and management techniques for these conditions.
	To assess the knowledge and identify the training needs of primary health care physicians in Saudi Arabia regarding the management of obesity. A questionnaire-based cross-sectional survey was undertaken among PHCC physicians in Saudi Arabia from May to October 2014.	Of the 707 physicians who completed the questionnaire, most demonstrated acceptable general knowledge about obesity. However, 83.6% had not undergone any specialized training on obesity. When it came to training priorities, physicians highlighted the need for psychotherapy (88%), counseling on nutrition/exercise (84%), medications (88%), and surgical therapy (75%). The perceived training needs were consistent across gender and nationality.	While physicians across Saudi Arabia exhibited satisfactory knowledge about managing obesity, there's a clear need for more comprehensive training, especially in areas of prevention and management of the condition.
<b>Al-Shammari YF. 2014. [27]</b>	The study aimed to understand the attitudes and practices of physicians in primary health care centers towards managing obesity in Eastern Province of Saudi Arabia. This cross-sectional study was conducted from December 2009 to March 2010. A questionnaire validated by 5 experts, assessed attitudes and practices related to obesity care at primary health care centers.	83% of physicians held a negative attitude towards obesity. Over two-thirds saw themselves as central in obesity management. Average attitude scores ranged from 2.95±1.06 to 4.34±0.82, acknowledging obesity as a disease and identifying challenges in weight reduction counseling. Most physicians advised obese patients on diet and exercise, with some referring them to dietitians. Half provided educational materials, but over two-thirds never prescribed weight reduction medications. Only a third felt adequately prepared to treat obesity.	Physicians in Eastern Saudi Arabia have mixed attitudes towards obesity management, showing an interest but identifying gaps in their preparation and approach. There's a clear need for enhanced education and training, continuing from medical school through post-graduate levels.

## DISCUSSION

Obesity is a recognized risk factor for numerous health complications including hypertension, coronary artery disease, stroke, diabetes, dyslipidemia, fertility issues, kidney problems, high blood sugar levels, sleep apnea, respiratory ailments, certain infections (like Covid-19), specific cancers, and osteoarthritis. Furthermore, obesity is linked with a heightened risk of death from all causes and a surge in health care costs. As of 2016, globally, the prevalence of overweight adults was 39% and obesity was at 13%, tripling since 1975. By 2030, the global obesity rate is forecasted to rise to 20% [28-33].

The challenge of addressing obesity in primary health care settings across Saudi Arabia is evident, as highlighted by a series of studies conducted in various regions. A glance at the sociodemographic characteristics and study designs of the selected studies paints a comprehensive picture. Our evaluation consists of nine studies, together including 1714 primary health care physicians in eight of the research pieces [1, 21-27] and 716 additional participants in one particular study [20]. Diving into gender distribution, the male participant proportion fluctuated across these studies, but on average, it balanced around the 50% mark [19-27]. This uniformity suggests a relatively equal representation of male and female perspectives in the discussed regions.

Geographical diversity is another intriguing facet of this research compilation. The studies spanned various regions of Saudi Arabia, such as Jazan [19], Riyadh [21], Makkah [22], Jeddah [23], the Northern [24], and Eastern [25] regions. Such regional inclusiveness allows for a broader understanding of primary health care challenges pertaining to obesity across the kingdom.

Ahmed AE and Awadallah SM's study [19] from Jazan underscored a prevailing sentiment of unpreparedness among primary health care physicians in addressing obesity. Despite their varied educational backgrounds, a significant number of these physicians felt inadequately equipped for obesity management. This self-perceived lack of preparedness was similarly echoed by Sebiany [25] and Al-Shammari [27] in the Eastern Province of Saudi Arabia. Such uniform findings across diverse regions emphasize a systemic challenge in the realm of obesity management training.

Further complexity is introduced when assessing specializations such as Weight Management Medications (WMMs) and bariatric surgery. Algarni's 2023 study [20] highlighted a substantial knowledge gap among the general populace regarding WMMs. Despite widespread awareness of traditional weight loss methods like diet and exercise, a minimal proportion of participants were familiar with WMMs. Contrastingly, Alenezi's 2022 study [24] on primary care physicians'

perspectives on bariatric surgery revealed that over half of the surveyed physicians lacked comprehensive knowledge about the procedure. This knowledge deficit among both the general public and primary care providers underlines a more profound educational and awareness issue concerning advanced obesity treatments in Saudi Arabia.

Primary care providers in countries such as Canada, the UK, and the USA are currently not fully prepared to handle the rising issue of childhood obesity. In Hungary, while there are multidisciplinary guidelines, they don't specifically cater to family doctors. Compliance with these guidelines is generally low, and general practitioners (GPs) lack financial incentives to follow them. The existing guidelines often view obesity more as a side effect than as a standalone issue. The most recent obesity guideline isn't accessible to every GP, and there's a wide variation in their knowledge, practices, and personal beliefs. Historically, medical education for the older generation of GPs, obesity wasn't characterized as a health concern. Their practice is typically based more on personal experience than on standard guidelines. This might explain why older doctors, especially those with higher BMIs, might be less engaged in treating obesity. In contrast, the younger GPs typically underwent specific training in family medicine [34-38].

When it comes to pediatric and adolescent obesity, Alotaibi's 2017 study [21] from Riyadh pointed out the pivotal role of external factors such as patient motivation and parental involvement in successful management. This study accentuates the need for a comprehensive, patient-centric approach in addressing childhood obesity.

Analyzing the competency of physicians in various stages of their careers, Alsaati and Almasaodi's 2020 study [22] found that family medicine candidates in Makkah had a gradient of understanding, attitude, and practice in obesity management. With increasing experience and levels of residency, there was a noticeable shift towards more favorable attitudes and improved practices. Such trends reinforce the significant role that continuous training and experience play in shaping physician perspectives and capabilities.

One study revealed a significant correlation between obesity and chronic noncommunicable diseases in the Saudi population, specifically diabetes, high cholesterol, and elevated blood pressure. Despite a decline in obesity rates in KSA over the past 8 years, its impact on these health conditions remains a concern for the future. Even with reduced obesity rates, the health repercussions persist. In KSA, individuals with conditions like high blood pressure, high cholesterol, or diabetes have a higher likelihood of being obese. On a global scale, the obesity crisis is closely tied to these health challenges. By 2010, hypertension emerged as a



major mortality risk, while diabetes-related deaths doubled from 1990. Noncommunicable diseases have become the primary health threats today. Advances in tackling infectious diseases have led to longer lives, but often at the expense of quality. In regions like the Arab world, this translates to prolonged years with compromised health, largely due to conditions like hypertension and diabetes, further straining health resources and lowering the quality of life [39-41].

Diving deeper into nutritional competence, Al-Gassimi's 2020 study [23] focused on the gap between perceived capabilities and actual practices of primary care physicians in offering nutrition care. While most believed they could effectively provide nutrition care, the real-world execution remained limited, possibly indicating a gap in resources or further training.

Throughout these studies, one consistent theme emerges—the importance and need for robust, ongoing training and resource allocation for primary health care professionals in Saudi Arabia. Given that obesity is a burgeoning health challenge, it's imperative that those on the front lines of care—our primary health care providers—are well-equipped, well-trained, and continuously updated. The comparative analysis of these studies [19-27] firmly establishes that there's much work to be done in bridging these knowledge and practice gaps.

## CONCLUSION

In conclusion, the summarized studies offer a holistic overview of the challenges and opportunities in obesity management within Saudi Arabia. The recurring themes of knowledge gaps, need for continued training and the emphasis on multi-disciplinary approaches echo global trends. As Saudi Arabia grapples with a rising obesity epidemic, these findings underscore the need for targeted interventions, training modules, and public health campaigns tailored to its unique cultural and healthcare framework.

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