

The Most Prevalent Perceived Barriers to Effective Implementation of Obesity Management: a Survey of Primary Care Physicians

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ABSTRACT

Background: Obesity has been recognized by most physicians and some public as a chronic disease associated with increased risk of several health-related complications that could necessitate medical interventions.

Study Design: A cross-sectional questionnaire-based survey was used to assess experiences and knowledge of primary care physicians towards current guidelines for management of obesity and to explore possible barriers for optimal obesity management.

Result: 91 physicians were recruited into this study, 32 were family medicine (FM) and 59 were internal medicine (IM). Analysis of data revealed an overall overweight with mean BMI of $26.8 \pm 5.8 \text{ kg/m}^2$. No significant difference was found between BMIs or age groups of FM and IM physicians. Although, 96.7% of participants recognized risks associated with obesity, only 9.9% believed in the feasibility of obesity treatment. The main perceived causes of obesity by physicians were junk foods and sedentary lifestyle. A number of barriers to optimal management of obesity were identified by participants, which are not only limited to the lack of compliance of obese individuals to weight loss strategies but also to insufficient training of physicians to manage and treat obesity. Moreover, 47.4% of physicians displayed substantial knowledge deficits for obesity medications, which was significantly prominent among IM physicians ($p\text{-value} = 0.005$).

Conclusion: The significant higher level of knowledge demonstrated by FM physicians could be attributed to their higher professional degrees and/or longer practice years. Therefore, it is pivotal to improve knowledge and awareness of primary care physicians by providing adequate training to overcome barriers for effective implementation of obesity management guidelines.

Keywords: Obesity, Management, Family medicine, Internal medicine, Barriers

1.0 Introduction

According to the World Health Organization (WHO) report in 2017, overweight is a very common health problem around the globe that is estimated to affect over 1.9 billion adults and over 380 million children aged less than 19 years (World Health Organization, 2017). More than 650 million of the adult population were obese, which approximately represent 13% of general population. The same report also revealed that obesity has immensely increased worldwide in the last three decades due to the current sedentary modern lifestyle. A substantial increase in the prevalence of obesity (more than 20%) has also reported in the Arabic countries, and particularly Saudi Arabia (Al-Quaiz, 2001; Al-Rukban, 2003). Several contributing factors were recognized to increase the incidence of overweight and obesity in children and adults, including consumption of unhealthy fatty food, deficiency of physical activity, family history and multiple pregnancies (Al-Quaiz, 2001; Badran & Laher, 2011).

Obesity has been recognized by innumerable medical and scientific societies as a chronic progressive disease characterized by an abnormal or excessive accumulation of body fat which requires life-long interventions and medical management. Obesity has also been associated to many health-related complications that can increased the risk for diabetes, hypertension, stroke, cardiovascular diseases, and even cancers (Mayoclinic.org, 2015). Obesity has been also recently considered in the United States as a stigma that could increase vulnerability of obese individuals to unfairness and escalate the bias and discrimination in employment, health-care and education settings (Puhl & Heuer, 2009).

Therefore, the goal of obesity treatment is not only for cosmetic considerations, but also for crucial preventing of health maladies or disturbing psychosocial issues associated with obesity. The increased awareness of healthcare providers for importance of obesity treatment have derived the health sectors to identify its plausible causes of obesity among various age groups in addition to establishing optimistic strategies for effective controlling of the increased incidence of obesity in various community (Al-Rethaiaa, Fahmy, & Al-Shwaiyat, 2010; Kropski, Keckley, & Jensen, 2008; Musaiger, 2011). However, a small number of studies were done in Arabic countries, particularly in the gulf region and Saudi Arabia, to identify such causes and to recognize factors associated with the increased prevalence of overweight and obesity especially in young generations in order to come up with an urgent action plan to overcome this dilemma.

Thus, this study aimed to assess knowledge, attitude and practice (KAP) of primary care physicians, including family (FM) and internal medicine (IM), towards obesity in order to explore their role in preventing obesity and to evaluate their awareness and knowledge of the current evidence-based guidelines for management of obesity, in addition to identifying possible barriers in their clinical practice for optimal obesity management.

2.0 Study Design

A cross-sectional questionnaire-based survey was used to assess the KAP of FM and IM physicians towards management of obesity. This study was done at King Abdulaziz Medical City, National Guard Health Affairs (NGHA)-Riyadh. Participants sample size was estimated based on the anticipated worst-case percentage of accuracy level and response rate of 50%

with a 95% confidence level and 5% margin of error using the Raosfot® online sample size calculator to be 91 individuals. Conceded participants were randomly selected from the total number of available FM and IM physicians in NGHHA hospitals in Riyadh. A self-administered questionnaire was distributed to the participants in this study from April 2016 to August 2016. The questionnaire consisted of three sections with 47 close-ended questions. The first section addresses the physicians' demographic data and their eating/physical activities (10 questions). Followed by 20 three-point Likert scale questions that evaluate physicians believes and attitudes towards obesity management. The third section assesses the participating physicians' knowledge and clinical practice experience in the management of obesity. The questionnaire was initially validated prior to the survey using a sample of 15 participants. The internal consistency of the questionnaire was 0.7 as measured by Cronbach's alpha.

The descriptive and statistical analyses of the data were performed with SPSS software version SPSS 21.0 [Release 21.0.0.0, IBM, USA]. Results are presented as frequencies or means \pm standard deviation (SD), percentages with interquartile range. Categorical variables were analysed using Pearson's chi-squared test (χ^2) or Fisher's exact test with 95% confidence interval (CI). Statistical significance was considered at p values less than 0.05.

3.0 Result

3.1 Sub heading

Out of 91 physicians enrolled in the study, 91 (100%) had responded back, however, only 88 (96.7%) of the received surveys were submitted with completed answers. Table 1 lists the general characteristic profile of physicians participated in the study. 63.7% of participants were males with the largest proportion (61.5%) were under 35 years of age. The majority of physicians were IM (64.8%). 25.4% of IM physicians were either consultant or assistant consultant compared to 31.3% of FM physicians. Most of participants (69.3%) have 5 or less years of experience. Only, 43.8% and 23.8% of FM and IM physicians, respectively, have more than 5 years of clinical experience.

Table 1: Characteristics of the participating physicians

	FM n = 32	IM n = 59	Total n = 91
Age distribution in years n (%)			
\leq 35 years	14 (43.8%)	42 (71.2%)	56 (61.5%)
36-45 years	12 (37.5%)	13 (22.0%)	25 (27.5%)
\geq 46 years	6 (18.8%)	4 (6.8%)	10 (11.0%)
Gender n (%)			
Male	21 (65.6%)	37 (62.7%)	58 (63.7%)
Female	11 (34.4%)	22 (37.3%)	33 (36.3%)
Professional degree n (%)			
Consultant	8 (25.0%)	12 (20.3%)	20 (22.0%)
Assistant consultant	2 (6.3%)	3 (5.1%)	5 (5.5%)
Resident	15 (46.9%)	36 (61.0%)	51 (56.0%)

Others (Staff physician)	7 (21.9%)	8 (13.6%)	15 (16.5%)
Years of Experience n (%)			
Still in training	5 (15.6%)	22 (37.3%)	27 (29.7%)
1-5 years	13 (40.6%)	23 (39.0%)	36 (39.6%)
6-10 years	8 (25.0%)	6 (10.2%)	14 (15.4%)
More than 10 years	6 (18.8%)	8 (13.6%)	14 (15.4%)

Table 2 displays body health features, eating habits and physical activities of participants. The overall mean of the calculated BMI values ($26.8 \pm 5.8 \text{ kg/m}^2$) displays an overall overweight among participants. No significant difference was found between FM and IM physicians BMIs with mean values of $26.5 \pm 3.6 \text{ kg/m}^2$ and $27.0 \pm 6.7 \text{ kg/m}^2$, respectively. None of the participating physicians was underweight, about 40% of them were having normal weight values and more than 58% of them were either overweight or obese. The majority of the participants (44.0%) claimed eating a balanced diet, however, more than one third admitted consuming a carbohydrate-rich diet. Although, 42.9% of the participants affirmed that they are engaged in daily activities, including sport workouts, 56% confessed having sedentary lifestyle (i.e., occasional or no physical activity).

Table 2: Body health features of the participating physicians.

	FM n = 32	IM n = 59	Total n = 91
Average Height-Weight-BMI			
Weight (kg)	75.4 \pm 17.9	75.9 \pm 22.2	75.7 \pm 20.7
Height (cm)	167.5 \pm 10.4	167.2 \pm 9.7	167.3 \pm 9.9
BMI (kg/m^2)	26.5 \pm 3.6	27.0 \pm 6.7	26.8 \pm 5.8
BMI Categories n (%)			
Underweight: BMI is less than 18.5	0 (0.0%)	0 (0.0%)	0 (0.0%)
Normal weight: BMI is 18.5 to 24.9	13 (40.6%)	24 (40.7%)	37 (40.7%)
Overweight: BMI is 25 to 29.9	12 (37.5%)	26 (44.1%)	38 (41.8%)
Obese: BMI is 30 or more	6 (18.8%)	9 (15.3%)	15 (16.5%)
Missed	1 (3.1%)	0 (0.0%)	1 (1.1%)
Eating Habits n (%)			
Carbohydrate	10 (31.3%)	24 (40.7%)	34 (37.4%)
Fat	2 (6.3%)	7 (11.9%)	9 (9.9%)
Protein	1 (3.1%)	5 (8.5%)	6 (6.6%)
Balanced diet	18 (56.3%)	22 (37.3%)	40 (44.0%)
Missed	1 (3.1%)	1 (1.7%)	2 (2.2%)
Physical Activity n (%)			
On daily basis	5 (15.6%)	9 (15.3%)	14 (15.4%)
Weekly	11 (34.4%)	14 (23.7%)	25 (27.5%)
Occasionally	14 (43.8%)	32 (54.2%)	46 (50.5%)
Never	1 (3.1%)	4 (6.8%)	5 (5.5%)
Missed	1 (3.1%)	0 (0.0%)	1 (1.1%)

Comparisons between the genders of participants (table 3) revealed a significant higher percentage of female physicians with normal weights (54.5%) in comparison to male physicians (32.8%) with chi-square value of 4.1379 ($p = 0.042$). However, when statistical comparisons of different BMI ranges were performed amongst participating age groups, it did not disclose any significant difference Table 4.

Table 3: Body mass index distribution between males and females of the participating physicians

	Male n = 58	Female n = 33	chi-square (P-value)
Weight (kg)	83.0 ± 21.7	63.2 ± 10.7	
Height (cm)	171.8 ± 8.6	159.5 ± 6.5	
BMI (kg/m ²)	28.0 ± 6.5	24.8 ± 3.9	
Under-weight n (%)	0 (0.0%)	0 (0.0%)	--
Normal weight n (%)	19 (32.8%)	18 (54.5%)	4.1379 (0.042)*
Over-weight n (%)	26 (44.8%)	12 (36.4%)	0.6195 (0.43)
Obese n (%)	12 (20.7%)	3 (9.1%)	2.0554 (0.15)
Missed n (%)	1 (1.7%)	0 (0.0%)	--

Table 4: Body mass index distribution between different age groups of the participating physicians

	Age < 35 n = 56	Age 36-45 n = 25	Age > 46 n = 10	chi-square (P-value)
Under-weight	0 (0.0%)	0 (0.0%)	0 (0.0%)	--
Normal weight	25 (44.6%)	11 (44.0%)	1 (10.0%)	The chi-square statistic is 4.3138 (p-value is 0.37)
	The chi-square statistic is 4.3799 (p-value is 0.11)			
Over-weight	23 (41.1%)	10 (40.0%)	5 (50.0%)	
	The chi-square statistic is 0.3219 (p-value is 0.85)			
Obese	8 (14.3%)	4 (16.0%)	3 (30.0%)	
	The chi-square statistic is 1.5278 (p-value is 0.47)			
Missed	0 (0.0%)	0 (0.0%)	1 (10.0%)	--

Table 5 exhibits levels of agreement/disagreement of participants believes and attitudes towards obesity management. More than 91% of the participants considered obesity as a chronic disease. Although, 96.7% recognized obesity as a risk factor associated with serious comorbidities and it should be treated to prevent further complications, only 9.9% believed that it is not difficult to treat obesity. Although the majority of the participants (84.6%) agreed on the importance of training for physicians to manage and treat obese patients, only one third of them received such training sessions. Moreover, more than two third of participants believe that it is not only the specialized physicians, but all general physicians are responsible for providing their patients with proper educational counselling about the health-related risks associated with overweight and obesity. Peculiarly, most participants (80.2%) frankly express their agreement for the impact of physician own weight and lifestyle on the initiative for obesity prevention. On the other hand, some of participating physicians (45.1%) clearly declared that patients themselves are responsible for reducing own weights and they could be represented as an obstacle which hinders or limits the effectiveness of management of their obesity. Table 5 reveals a general consistency among participating physicians about a number of barriers that they are facing with obese individuals during their overweight management. These barriers include 1) lack of food calorie labelling, 2) time constrains and workload, 3) lack of Arabic resources and 4) lack of support group. The most important perceived barrier to effective management of obesity was the lack of support group (74.7%). Additionally, more than half of the participants (52.7%) reported that their practice sites are not ready to manage obese patients.

Table 5: Levels of agreement/disagreement regarding believes and attitudes of participants towards obesity management

Statements	Agree n (%)	Neutral n (%)	Disagree n (%)
Physician believe			
1. Obesity is a chronic disease	83 (91.2%)	5 (5.5%)	3 (3.3%)
2. Obesity is associated with serious comorbidities and it should be treated to prevent further complications	88 (96.7%)	2 (2.2%)	1 (1.1%)
3. Obesity is difficult to treat (n = 90)	55 (60.4%)	26 (28.6%)	9 (9.9%)
Physician Factors			
4. It is important to be well trained regarding obesity and its treatment before dealing with obese patients	77 (84.6%)	11 (12.1%)	3 (3.3%)
5. I am well trained to treat and manage obese patients	30 (33%)	49 (53.8%)	12 (13.2%)
6. Only specialized physicians with training in obesity management are responsible for treating obese patients.	29 (31.9%)	32 (35.2%)	30 (33.0%)
7. General physicians are responsible for educating patients about health-related risks associated with being overweight/obese	72 (79.1%)	16 (17.6%)	3 (3.3%)
8. The physician's weight and lifestyle	68 (74.7%)	21 (23.1%)	2 (2.2%)

can impact obesity prevention initiative			
9. Most obese patients have more important medical problems that need attention	73 (80.2%)	12 (13.2%)	6 (6.6%)
Patients Factors			
10. People respond negatively when discussing their weight with them (n = 90)	37 (40.7%)	37 (40.7%)	16 (17.6%)
11. Most obese people are less focused on losing weight and deny their lifestyle (n = 90)	47 (51.6%)	28 (30.8%)	15 (16.5%)
12. Most obese patients do not comply with strategies aimed at changing their lifestyles.	54 (59.3%)	31 (34.1%)	6 (6.6%)
13. It is the patients' responsibility to reduce weight themselves (n = 90)	41 (45.1%)	31 (34.1%)	18 (19.8%)
14. Obese patients are not very cooperative when discussing weight issues with them	33 (36.3%)	36 (39.6%)	22 (24.2%)
15. Most obese patients consider their weight a medical problem	39 (42.9%)	41 (45.1%)	11 (12.1%)
Site/Practice barriers			
16. Lack of food labelling and caloric information prevent people from making healthier food choices	55 (60.4%)	28 (30.8%)	8 (8.8%)
17. Time constrains and workload prevent me from focusing on treating obesity	60 (65.9%)	24 (26.4%)	7 (7.7%)
18. Lack of resources in Arabic prevents obese patients from getting help	49 (53.8%)	36 (39.6%)	6 (6.6%)
19. Lack of support group is a barrier (n = 89)	68 (74.7%)	20 (22%)	1 (1.1%)
20. My practice site is not prepared to manage obese patients	48 (52.7%)	30 (33%)	13 (14.3%)

Perspective attitude and believes of the participating physicians toward obesity in their patients are displayed in table 6. The majority of physicians (more than 50%) believe that the main reasons for gaining weight are one or more of the following factors: over consumption of junk food, family history /genetic factors, sedentary life style, too much sugar intake, and lack of motivation to maintain healthy weight. Most of the participating physicians recognized several health complications of obesity. The vast majority of participating physicians do not recommend herbal or over the counter remedies to patients to lose weight. However, they occasionally discuss weight reduction with their overweight/obese patients and most of the time referred them to a nutritionist or a dietitian.

Table 6: Perspective attitudes and believes of the participating physicians toward obesity in their patients

Variables n (%)	FM n = 32	IM n = 59	Total n = 91
Main reasons for gaining weight			
Over consumption of junk food	29 (90.6%)	54 (91.5%)	83 (91.2%)
Family history /genetic factors	28 (87.5%)	32 (54.2%)	60 (65.9%)
Sedentary life style	32 (100.0%)	57 (96.6%)	89 (97.8%)
Too much sugar intake	22 (68.8%)	33 (55.9%)	55 (60.4%)
Metabolic/hormonal disorders	16 (50.0%)	24 (40.7%)	40 (44.0%)
Difficult to afford healthy food	16 (50.0%)	22 (37.3%)	38 (41.8%)
Lack of motivation to maintain healthy weight.	27 (84.4%)	47 (79.7%)	74 (81.3%)
Complications of obesity			
Cardiac problems	32 (100.0%)	58 (98.3%)	90 (98.9%)
Endocrine abnormalities	31 (96.9%)	49 (83.1%)	80 (87.9%)
Social issues	31 (96.9%)	52 (88.1%)	83 (91.2%)
Depression and anxiety	30 (93.8%)	48 (81.4%)	78 (85.7%)
Guidelines followed in treating obese patients			
AHA/ACC/TOS	6 (18.8%)	22 (37.3%)	28 (30.8%)
NICE Guidelines	16 (50.0%)	13 (22.0%)	29 (31.9%)
Up-to-date Guidelines	19 (59.4%)	31 (52.5%)	50 (54.9%)
Other Guidelines	1 (3.1%)	3 (5.1%)	4 (4.4%)
Do you discuss weight reduction with your overweight/obese patients?			
Yes	23 (71.9%)	28 (47.5%)	51 (56.0%)
No	6 (18.8%)	11 (18.6%)	17 (18.7%)
Sometimes	3 (9.4%)	20 (33.9%)	23 (25.3%)
How do you diagnose obesity?			
Weight only	4 (12.5%)	10 (16.9%)	14 (15.4%)
BMI	28 (87.5%)	55 (93.2%)	83 (91.2%)
Appearance	3 (9.4%)	12 (20.3%)	15 (16.5%)
Waist circumference	6 (18.8%)	18 (30.5%)	24 (26.4%)
Do you usually apply these strategies to treat your obese patients?			
Exercise and physical activity	29 (93.5%)	57 (96.6%)	86 (95.6%)
Recommend eating healthy diet	29 (93.5%)	52 (88.1%)	81 (90.0%)
Treat with anti-obesity drugs	8 (25.8%)	15 (25.4%)	23 (25.6%)
Provide written information	12 (38.7%)	18 (30.5%)	30 (33.3%)
Refer to behavioral therapy	8 (25.8%)	18 (30.5%)	26 (28.9%)
Missing data	1 (3.1%)		1 (1.1%)
Do you normally refer your obese patients to a nutritionist/ dietitian?			
Yes	19 (63.3%)	22 (37.9%)	41 (46.6%)
No	6 (20.0%)	18 (31.0%)	24 (27.3%)
Sometimes	5 (16.7%)	18 (31.0%)	23 (26.1%)
Missing data	2 (6.3%)	1 (1.7%)	3 (3.3%)

Do you normally refer your obese patients to a surgeon if they meet the appropriate criteria?			
Yes	19 (61.3%)	24 (41.4%)	43 (48.3%)
No	8 (25.8%)	25 (43.1%)	33 (37.1%)
Sometimes	4 (12.9%)	9 (15.5%)	13 (14.6%)
Missing data	1 (3.1%)	1 (1.7%)	2 (2.2%)
Do you assess the adherence of your patients to obesity management therapy?			
Yes	14 (45.2%)	17 (28.8%)	31 (34.4%)
No	7 (22.6%)	23 (39.0%)	30 (33.3%)
Sometimes	10 (32.3%)	19 (32.2%)	29 (32.2%)
Missing data	1 (3.1%)		1 (1.1%)
Do you recommend herbal/ over the counter remedies to your patients to lose weight?			
Yes	1 (3.2%)	1 (1.7%)	2 (2.2%)
No	28 (90.3%)	54 (91.5%)	82 (91.1%)
Sometimes	2 (6.5%)	4 (6.8%)	6 (6.7%)
Missing data	1 (3.1%)		1 (1.1%)

Table 7 shows the percentage of participants, who correctly answered a number of questions assessing their knowledge regarding management of obesity. A total of 68.8% and 61.05% of FM and IM physicians, respectively, knew that anti-obesity drugs can be effective if BMI is equal to or more than 30 kg/m². And 42.9% of the participants recognized orlistat–lorcaserin as the first-line drugs for managing obesity in adults. Moreover, 75.0% of FM and 61.0% of IM physicians knew that bariatric surgery could be an acceptable choice in patient with BMI more than 40kg/m² if diet, exercise, and drugs failed. However, they were generally reluctant to refer eligible obese patients to surgeons. On the other hand, about half of participating physicians (47.4%) displayed substantial knowledge deficits (percentages of wrong answers) of the therapeutic approaches for the treatment of obesity. The largest deficit among all physicians was 87.9%, which was about “the drug of choice to treat obesity with comorbidities e.g. hypertension, diabetes mellitus”, with a significant higher deficiency among the internal medicine physicians (p-value = 0.005), only 5.1% of them have answered that question correctly. Moreover, about 50% of internal medicine physicians did not have appropriate conception about the psychiatric risks associated with the use of phentermine plus extended-release topiramate as anti-obesity drugs.

Table 7: Participating physicians' knowledge of obesity management.

Question (Answer)	Total n = 91		FM n = 32		IM n = 59		P- value #
	n	%	n	%	n	%	
Anti-obesity drugs can be effective if BMI is ... (≥ 30 kg/m ²)	58	63.7%	22	68.8%	36	61.0%	0.46
The first line drug for managing obesity in adults is ... (Orlistat – lorcaserin)	39	42.9%	17	53.1%	22	37.3%	0.14
The drug of choice to treat obesity with comorbidities e.g. hypertension, diabetes mellitus ... (Lorcaserin)	11	12.1%	8	25.0%	3	5.1%	0.005 **

Bariatric surgery should be a choice if diet, exercise, and drugs failed in patient with BMI ... (>40 kg/m ²)	60	65.9%	24	75.0%	36	61.0%	0.18
The reasonable choice of drug to reduce weight in patient with diabetes mellitus type II is ... (Metformin)	80	87.9%	30	93.8%	50	84.7%	0.21
The criteria for discontinue a drug therapy in obesity treatment is ... (patient does not lose 5% of the body weight after 12 weeks of treatment)	33	36.3%	15	46.9%	18	30.5%	0.12
Monitoring neuropsychiatric side effects, suicidal thought, depression, serum creatinine is necessary if the following drug is prescribed ... (Phenteramine-extended release topiramate)	54	59.3%	24	75.0%	30	50.8%	0.025 *
Overall average	47.9	52.6%	20.0	62.5%	27.9	47.2%	0.63

Statistical comparisons between FM and IM were performed using chi-square statistical analysis for p-values calculation. Where, * P < 0.05 and ** p < 0.001.

Table 8 displays statistical analyses of the level of knowledge among participants according to their various characteristic features. A significant greater percentage of FM physicians (62.5 ± 22.6%) answered questions that assessed level of knowledge of than IM physicians (47.2 ± 25.7%), with p-value of 0.0045. However, no significant difference was found amongst other participants variables.

Table 8: Statistical analyses of the level of knowledge of obesity management among participants according to their various characteristic features

Characteristics	Number of respondents	% Correct answers (% ± SD)	P-value #
Physician specialty			
Family Medicine	32	62.5 ± 22.6%	0.0045**
Internal Medicine	59	47.2 ± 25.7%	
Age distribution in years n (%)			0.8697
≤ 35 years	56	53.1 ± 26.3%	
36-45 years	25	53.1 ± 25.2%	
≥ 46 years	10	48.6 ± 19.5%	
Gender n (%)			0.2404
Male	58	50.2 ± 25.1%	
Female	33	56.7 ± 25.2%	
Professional degree n (%)			0.8772
Consultant	20	48.6 ± 24.4%	
Assistant consultant	5	54.3 ± 39.5%	
Resident	51	53.2 ± 24.7%	
	15	55.2 ± 26.6%	

Others (Staff physician)			
Years of Experience n (%)			
Still in training	27	52.4 ± 28.2%	0.9843
1-5 years	36	52.0 ± 26.2%	
6-10 years	14	55.1 ± 22.9%	
More than 10 years	14	52.0 ± 25.0%	

Statistical analyses for p-values calculation were performed using either by t-test or ordinary one-way ANOVA and multiple comparisons. Where, ** $p < 0.01$.

4.0 Discussion

The knowledge, attitude and practice (KAP) of FM and IM physicians towards management of obesity was assessed in the present study using a questionnaire-based survey, which explores the physicians' awareness and experiences in their clinical settings. The used survey also addressed the participants eating habits and physical activities to realize the relationship between the weight and lifestyle of the physicians and their attitude towards implementing obesity prevention and management strategies in their clinical practices.

Although most participating physicians claimed to consume a balanced diet, the results of the present study revealed high levels of obesity amongst FM and IM physicians. However, no significant difference was found between various BMI ranges or age groups of participants. The majority of the participants admitted having sedentary lifestyles with limited or no physical activities. The lack or deficient physical activity is a frequent recognized cause of obesity reported in numerous studies (Booth, Roberts, & Laye, 2012; Fogelholm, 2010; Koyuncuoğlu Güngör, 2014).

The vast majority of surveyed physicians recognized obesity as a deleterious chronic disease associated with serious illnesses and complications that could necessitate medical interventions. However, most of physicians believed that it is usually difficult to treated obesity in general public. Moreover, they clearly expressed the importance of referring obese patients to a nutritionist or a dietitian, however, they were hesitated to acknowledge weight loss medications or bariatric surgery in obese patients even if they meet the criteria for such interventions (Alshammari, 2014). This may perhaps reflect a personal attitude or a professional experience with obesity that could disruptively impact their enthusiasm to implement any obesity prevention management strategy. For example, more than half of the participating physicians explicitly assumed that most obese individuals are either not seriously concerned about losing weight or they are usually not cooperative in complying with the defined weight loss strategies to change their lifestyles in order to solve the problem of obesity, which was a barrier recognized by most participants. Other possible barriers for effective management of obesity were also reported by several studies including lack of awareness of obesity as a chronic malicious condition, shortage of primary health system, privation of dietician services, low socioeconomic status, lack of support group, time constraints and existence of comorbidities (Forman-Hoffman, Little, & Wahls, 2006; Klumbiene, Petkeviciene, Vaisvalavicius, & Miseviciene, 2006; Mauro, Taylor, Wharton, & Sharma, 2008; Ruelaz et al., 2007). Moreover, the present study also recognized an important obstacle among obese individuals, which is the lack of food calorie labelling or deficient

resources in the spoken mother tongue of the public that guide people to consume healthy foodstuff.

Several studies have conceded primary care physicians as role models for community to advocate for obesity prevention and acknowledged their responsibilities in increasing public awareness towards healthy eating and providing appropriate patients counselling for prevention and management of obesity (Al-Ghawi & Uauy, 2009; Koyuncuoğlu Güngör, 2014; Vine, Hargreaves, Briefel, & Orfield, 2013). Although, most of participants agreed that it is the responsibility of all primary care physicians to familiarize their patients about the health-related risks associated with overweight and obesity, the present study clearly reveals an unambiguous knowledge deficit among physicians in comprehending the current evidence-based guidelines for obesity management. Less than half of participants knew the first-line medications for managing obesity in adults. Unfortunately, a very modest proportion of physicians recognized the risks associated with the use of anti-obesity drugs or the drug of choice to treat obesity in patients with comorbidities, such as hypertension or diabetes mellitus. These adverse events are not uncommon, which might affect more than 10% of patients using phentermine plus extended-release topiramate for weight loss (Lonneman, Rey, & McKee, 2013). Other reported adverse effects of these anti-obesity drugs include constipation, paresthesia, insomnia, irritability, anxiety, headache, attention disturbances, depression, dry mouth, and dizziness (Allison et al., 2012). That could require careful monitoring of these deleterious effects.

A significant lower level of knowledge was revealed in IM physicians compared to FM physicians. The reason for knowledge deficits among IM physicians, is not definitely fully comprehend but it could reflect deficient education or insufficient training. The noteworthy increased percentage of participating FM physicians who answered the assessment questions could reflect higher level of knowledge of obesity management as a result of their higher experience (i.e., professional degree) or longer practice years. These deficits were also reported in other studies assessing physicians' knowledge of obesity management in different primary health care settings regarding (Flocke, Clark, Schlessman, & Pomiecko, 2005; Huang et al., 2004; Kolasa & Rickett, 2010). Several studies had also distinguished inexperienced or unqualified physicians or dietitians in addition to inadequate clinical practice sites as hindering barriers to optimal management of obesity in patients (Almajwal, Williams, & Batterham, 2009; Rurik et al., 2013; Sebiany, 2013). However, most participants in present study showed a high level of interest in participating in appropriate training sessions to improve their competencies for obesity prevention and management approaches.

Currently, the pharmacotherapy options for treatment of obesity are rather limited. Several medications for treatment of obesity had been approved by the U.S. Food and Drug Administration (FDA) (U.S. Food and Drug Administration, 2018). However, many of which have been withdrawn from the market due to their deleterious adverse effects (Daneschvar, Aronson, & Smetana, 2016). Accordingly, the available anti-obesity drugs are only recommended for short-term use in extremely obese patients with BMI more than 30, or in overweight patients (BMI of 27 or above) concomitant with health-related risks (Apovian et al., 2015). Therefore, recognizing the prominent values of comprehensive patient lifestyle changes, such as caloric restriction, physical activity, and behaviour modifications are crucial to ensure long-term effective implementation of any obesity prevention management strategy and to reduce the health burden of obesity.

Last but not least, it is necessary to explore the influence of training sessions on improvement of the physician's knowledge and thus their negative attitude toward obesity management. Further investigation of the role of physicians and nutritionists/dietitians in the prevention and management obesity is also required. An important limitation of the present study is that it was done in relatively a small number of physicians from one tertiary healthcare centre; hence, it is pivotal to expand the sample size from different clinical sites and to include other specialties for further validation before drawing a definitive conclusion. Furthermore, this study could be also limited to the possibility of social desirability bias because of its design as a self-administered survey, which increase tendency of participants to over exaggerate or over-report "favourable performance" and/or understate any negative attitude or misconduct.

5.0 Conclusion and recommendation

The majority of participating physicians display great attitudes towards the importance of obesity management in patients to reduce the associated risk with other comorbidities. However, a substantial knowledge deficit to the drug treatment of obesity has been recognized among most participating physicians, particularly IM, which could be attributed to the insufficient professional experiences. A number of barriers to the optimal management of obesity were also identified. The most important obstacles recognized by physicians were lack of compliance of obese individuals to the required lifestyles changes and weight loss strategies in addition to insufficient and appropriate training of physicians to manage and treat obesity in patients. Efforts are required to provide adequate educational and training programs on the current obesity management guidelines to overcome these barriers and to improve knowledge of physicians for effective implementation of any obesity management approach.

Acknowledgement

Ethical approval for this study was obtained from Institutional Review Board at King Abdullah International Medical Research Centre, Riyadh, Saudi Arabia (Reference no. IRBC/16/040/R). A permission for enrolling participants was also granted from the corresponding physicians' department director at the NGHA hospital. No personal identifiers were asked or collected in the used questionnaire.

Authors would like to express their gratitude for the appreciated contribution of all participants. Thanks also go to Mr. Saleh Alomary, Mr. Faris Alasmari, and Mr. Mohammad Aljarallah for their help and support in data collection.

Declaration

Author(s) declare no conflict of interest to disclose.

Authors contribution

Author 1: Study design, data interpretation, manuscript editing,

Author 2: Study design, statistical analysis, data interpretation, manuscript preparation,

Author 3: Literature search, data collection,

Author 4: Literature search, data collection,

Author 5: Study design, literature search, data collection,

Author 6: Manuscript review,

Author 7: Manuscript review.

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