



PERCEPTIONS OF OBESE VISITORS REGARDING WEIGHT MANAGEMENT PRACTICES IN PRIMARY HEALTH CENTERS

Clinical Research

Haneen Alnweider*	R3 Family Medicine Resident, Saudi Board of Family Medicine, Ministry of Health, Saudi Arabia * Corresponding Author
Hayat Alotaibi	R3 Family Medicine Resident, Saudi Board of Family Medicine, Ministry of Health, Saudi Arabia
Areej Alqahtani	Family Medicine Consultant, SBFM - ABFM, Ministry of Health, Saudi Arabia
Maha Altawansy	MBBS, MSC, PhD in Public Health and Community Medicine

ABSTRACT

Objectives: To explore the perceptions of obese primary health center (PHC) visitors regarding the practice of weight management in primary healthcare settings.

Methodology: A self-administered questionnaire was administered to 387 overweight and obese visitors of PHCs in Dammam and Al Khobar in 2018.

Results: About two-thirds of PHC visitors were obese. Most PHC visitors (71.6%) reported that PHC programs did not support them in their weight management. Overall, obese PHC visitors did not report negative interactions with their physicians. Of the obese visitors, 46.8% to 65.1% were satisfied with the level of the healthcare provided, while 23.0% to 35.1% were dissatisfied. The study shows a significant relationship between self-perception and actual body weight ($p=0.000$).

Conclusion: The study suggests that obesity is not adequately managed in Saudi Arabia. Obese visitors had good impressions of weight management and a high level of satisfaction with the general care provided to them.

KEYWORDS

Weight management, Perception, Primary health care, Saudi Arabia.

INTRODUCTION

Being obese or overweight presents a major public health problem; overweight and obesity are defined as "abnormal or excessive fat accumulation that presents a risk to health." They are measured by body mass index (BMI), which is defined as "a person's weight in kilograms divided by a person's height in meters." A person with a BMI of 25-29.9 is overweight, while a BMI of 30 and above is obese. There are different stages of obesity (World Health Organization).

Obesity is caused by multifactorial risk factors and leads to many non-communicable diseases, including diabetes mellitus, dyslipidemia, hypertension, coronary heart disease, osteoarthritis, and several physical and mental disorders that usually worsen as the level of obesity increases (Al-Baghli et al., 2008; Ministry of Health, 2017). Saudi Arabia has one of the highest rates of obesity and overweight in the world (WHO, 2017), and the trend is increasing, expected to include 50% of the populations by 2030. A study showed that obese patients represented 28.7% of the population and overweight patients 30% (Memish et al., 2013).

The goal of weight management at primary health centers (PHCs) is to reduce the morbidity and mortality of overweight and obese patients and to decrease the related burden on the healthcare system, particularly the greater utilization of services by overweight and obese patients (Musich et al., 2016). As PHC physicians are the first to detect and treat common conditions, they play a central role in the systematic assessment and management of obesity (Alshammari, 2014; Tan, Zwar, Dennis & Vagholkar, 2006). In addition, by considering the perspective of the individuals visiting healthcare facilities, especially PHCs, real input can be gained about patients' experiences at PHCs, which will ultimately affect the outcome of treatment and the quality of care (Wee et al., 2002).

The importance of measuring patient perceptions is to reflect on patients' ideas and expectations about their medical conditions and about the services provided for these conditions. In addition, such an understanding will deepen and extend the relationship between patients and their healthcare providers, which is the factor that most influences weight loss (Fan, Burman, McDonell, & Fihn, 2005; LaVela SL & Gallan, 2014). In the United States, a study was conducted in 2000 on "Obese women's perceptions of their physicians' weight management attitudes and practices." The study found that obese patients were being treated disrespectfully (Wadden et al., 2000).

In Canada, a 2017 qualitative study measured patient perceptions of

the role of PHCs in obesity management. This study demonstrated that, besides a greater availability of resources, clinicians expected to initiate individualized discussion about weight management, depending on patients' medical conditions, socioeconomic status, and educational background. This practice led to better coordination and follow-up (Torti et al., 2017). In 2006, another qualitative survey done in the United Kingdom explored the experiences and perceptions of 28 patients after being diagnosed as obese. Improving the quality of care in PHCs to more adequately address the complexities of obesity management was recommended (Brown, Thompson, Tod, & Jones, 2006).

Need for the Study

To the best knowledge of the researchers, no local studies have assessed the perception of overweight and obese visitors regarding the practice of weight management at PHCs in the Eastern Province of the KSA. By targeting obese PHC visitors, rather than visitors with other health issues, the researchers focused on the practices of weight management as they believed that many obese and overweight patients were underdiagnosed and mismanaged.

The researchers were able to reflect on the ability of primary care physicians to manage obesity through education, prevention, and treatment. In addition, an emphasis was placed on weight management practices, utilizing guidelines, assessing comorbid conditions and risk factors, encouraging patients to lose weight, and observable decrease in obesity.

Aims

To evaluate obese PHC visitors' perceptions of weight management in the primary healthcare settings, and to discover the preferable methods for the management of obesity.

METHODS

Study Design

A cross-sectional design was used.

Participants and Setting

The focus of this study was overweight and obese visitors in PHCs in two cities in the Eastern Province of Saudi Arabia, Dammam and Alkhobar, during 2017 and 2018.

Sampling Size and Technique

The sample size was calculated using Raosoft, assuming a margin of error of 5%, 95% CI, and response distribution of 50%. There were 387

overweight and obese visitors. Multi-stage sampling technique was used to select the sample. This was done in three stages:

- Stage 1: Two cities in the Eastern Province, Dammam and Alkhobar, were selected by a cluster sampling technique.
- Stage 2: PHCs from Dammam and Alkhobar were selected according to the proportion of centers in Alkhobar and Dammam (40%, 60%), a ratio of 5:18 respectively. A systematic sampling technique was used to select PHCs.
- Stage 3: PHC visitors were classified into three groups according to their BMI: normal weight, overweight, and obese. The overweight and obese visitors were selected to be included in the study.

Inclusion Criteria

The following were the inclusion criteria: age > 18 years, BMI $\geq$ 25, of either gender, Saudi or non-Saudi

Exclusion Criteria

The following people were excluded: Pregnant women, children and adolescents, and acutely ill patients.

Pilot Study

A pilot study was conducted with 30 participants, with the study instrument distributed in two primary health centers, one each in Dammam and Alkhobar. The pilot study tested the reliability of the study (Dammam: 0.982, Alkhobar: 0.997), established the estimated time needed to fill out the questionnaire, and assessed the data management procedure. The health centers in the pilot study were excluded from the actual study. According to the pilot study results, modifications were made to the questionnaire.

Data Collection

BMI was calculated at the time of PHC visit. The participants who met the inclusion criteria filled out a structured questionnaire.

Instrument

The self-administered questionnaire was designed based on a literature review. The questionnaire was translated into Arabic for participants, then the information was retranslated into English for analysis. The measure's reliability and validity was assessed in the period from May 22 to August 6, 2017. The items included

1. obese PHC visitors' traits and health status, including: age, BMI, and sociodemographic data.
2. obese PHC visitors' health status: Smoking or non-smoking, alcohol consumption, chronic conditions, and any history of surgical intervention to lose weight (Restrictive, Malabsorptive, Combined, or None).
3. weight management: Physicians' gender and scientific degree.
4. recommendations of physician versus recommendations of obese PHC visitors.
5. two-question screen for depression (low mood and loss of interest) with the following possible answer choices: not at all, several days, more than half of the days in the past two weeks, or nearly every day (Maurer, 2012).
6. obese PHC visitors' perceptions of their physicians' weight management attitudes and practices (obese PHC visitors' level of satisfaction with the care provided by the physician and any negative interactions) (Wadden et al., 2000).

Coding and Scoring

Participants were screened for depression using PHQ-2; it consists of 2 questions, each scored on a scale of 0-3 (0 = not at all, 1 = several days, 2 = more than half the days, or 3 = nearly every day).

Obese PHC visitors' satisfaction with care provided to manage their weight, was rated on a seven-point Likert scale: 7 = very satisfied, 6 = moderately satisfied, 5 = slightly satisfied, 4 = neutral or neither satisfied nor dissatisfied, 3 = slightly dissatisfied, 2 = moderately dissatisfied, or 1 = very dissatisfied. After analysis, this was altered to a three-point Likert scale: 1 = dissatisfied, 2 = neutral, or 3 = satisfied. Reliability coefficients ranged from $r = 0.62$ to $r = 0.79$.

Negative, weight-related interactions with physicians was measured by selecting 1 of 5 responses (1 = always, 2 = usually, 3 = sometimes, 4 = rarely, or 5 = never. Reliability coefficients ranged from 0.54 to 0.74.

Data Management

All the collected data were checked and coded before it was entered

into a computer. Data entry and analysis were done using the Statistical Package for the Social Sciences (SPSS) statistical program version 22.

Data Analysis

Descriptive statistics were used to describe all demographic data and related factors. Association between variables were tested using ANOVA, t-test, and chi-squared test. A p -value less than 0.05 was considered statistically significant.

Validity and Reliability

The questionnaire was validated by three consultants. Two consultants were family medicine consultants and the third was a public health consultant.

Ethical Considerations

The study was approved by the institutional review board (IRB) for research and a local committee of our institution prior to implementation of the study. All information from the questionnaire has been kept confidential. By answering the questionnaire, informed consent was provided.

RESULTS

PHC Obese Visitors' Traits

Figure 1 shows that about 2/3 of the PHC visitors are obese.

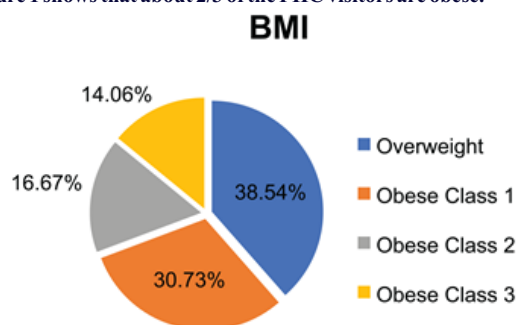


Table 1 shows that the mean weight of the obese PHC visitors was 89.48 and the mean height 167.50. Most of the obese PHC visitors were highly educated (46.5%). More than half (63%) felt they were overweight, 83.9% were motivated to lose weight, 80.7% tried a number of attempts: 33.9% 1-2 times, 26 % 3-4 times, and 21.1% tried 5 times or more. Using the PHQ-2 to screen for depression resulted in a 58.7% positive diagnosis for depression.

Table 1 Demographic data and obese PHC visitors' traits: N = 387

	N	%
Age, mean $\pm$ SD	36.87 $\pm$ 11.58	
Weight, mean $\pm$ SD	89.48 $\pm$ 19.80	
Height, mean $\pm$ SD	167.50 $\pm$ 79.92	
Screening test for depression (PHQ-2) %		
Positive	227	58.7%
Negative	160	41.3%
Gender %		
Male	173	44.7%
Female	214	55.3%
Nationality %		
Saudi	313	80.9%
Non-Saudi	74	19.1%
Marital Status %		
Not Married	76	19.6%
Married	291	75.2%
Divorced	16	4.1%
Widow/Widower	4	1.0%
Educational Level %		
Higher Education	20	5.2%
University	160	41.3%
Secondary	138	35.7%
Intermediate	41	10.6%
Primary	18	4.7%
Not Educated	10	2.6%
Employment %		
Employed	199	51.4%
Unemployed/Housewife	188	48.6%

Monthly Income %		
< 5,000 SAR	155	44.9%
5,000-10,000 SAR	128	37.1%
10,000 SAR or more	62	18.0%
How do you feel about yourself? %		
Underweight	7	1.9%
Ideal weight	66	17.5%
Overweight	239	63.2%
Obese	66	17.5%
How do feel about your physical activity? %		
Low	108	28.4%
Medium	215	56.6%
High	57	15.0%
Are you motivated to lose weight? %		
No	61	16.1%
Yes	317	83.9%
Have you tried to lose weight? %		
No	73	19.3%
Yes	306	80.7%
Number of weight loss attempts? %		
Zero	73	19.0%
1-2	130	33.9%
3-4	100	26.0%
5 or more	81	21.1%
Disease %		
Diabetes	68	17.6%
Hypertension	79	20.4%
Dyslipidemia	19	4.9%
Endocrine disease	14	3.6%
Repertory disease	23	5.9%
Rheumatology	17	4.4%
Depression and anxiety	18	4.7%
Insomnia	27	7.0%
Eating disorders	10	2.6%
Kidney disease	1	.3%
Gynecological PCO	7	1.8%
Other	18	4.7%
Surgical intervention	6	1.6%
Smoking	74	19.9%
Alcohol	5	1.3%

Weight Management Practices

Table 2: Most of the obese PHC visitors (71.6%) reported that the resources of PHCs and healthcare programs did not support them in weight management. In addition, about half reported that physicians did not discuss their weight or weight control with them or even inform them that they were overweight/obese.

Table 2 Issues related to healthcare services and weight management practices

Physician Characteristic	N	%
Your physician's gender %		
Male	186	50.7%
Female	181	49.3%
Your physician's specialty %		
Family Medicine	51	14.0%
General Practitioner	175	47.9%
I don't know	102	27.9%
Other	37	10.1%
Weight Management Practice	N	%
Are primary healthcare programs and/or resources supporting you in weight management? %		
No	270	71.6%
Yes	107	28.4%
Has your doctor told you that you are obese or overweight? %		
No	215	56.4%
Yes	166	43.6%
Number of primary health center visits during the last year? %		
Zero	82	21.8%
1-2	119	31.6%
3-4	85	22.6%
5 and more	90	23.9%

How often does your doctor discuss weight control with you? %		
Zero	205	53.4%
1-2	117	30.5%
3-4	9.1	9.1%
5 and more	7	7.0%

In Table 3, overall, obese PHC visitors did not report negative interactions with their physicians. About 76% did not report that the doctors said a critical or insulting thing to them about their weight. Approximately 67% of the obese PHC visitors reported that the physicians never criticized them for not trying harder when obese PHC visitors lost weight and regained it. They felt that they could speak freely with their doctors, and they also felt that their doctors believed them, understood their difficulties with being overweight, and treated them as they would average-weight people without discrimination.

Table 3 Obese PHC visitors' reports of negative interactions regarding weight management

Variable	N	%
"When I lost weight and regained it, doctors criticized me for not trying harder."		
Never	257	67.5%
Rarely	48	12.6%
Sometimes	38	10.0%
Usually	17	4.5%
Always	21	5.5%
"Doctors have said critical or insulting things to me about my weight."		
Never	292	76.8%
Rarely	40	10.5%
Sometimes	25	6.6%
Usually	10	2.6%
Always	13	3.4%
"Doctors have tried to scare me into losing weight by warning me about health risks associated with being overweight."		
Never	241	63.6%
Rarely	26	6.9%
Sometimes	44	11.6%
Usually	37	9.8%
Always	31	8.2%
"I feel I cannot speak freely with doctors about my weight."		
Never	259	68.2%
Rarely	36	9.5%
Sometimes	35	9.2%
Usually	24	6.3%
Always	26	6.8%
"I feel that doctors don't believe me when I tell them that I don't eat that much."		
Never	251	66.4%
Rarely	33	8.7%
Sometimes	42	11.1%
Usually	28	7.4%
Always	24	6.3%
"I feel the doctors don't treat overweight people as nicely as they do average-weight people."		
Never	271	71.3%
Rarely	39	10.3%
Sometimes	33	8.7%
Usually	19	5.0%
Always	18	4.7%
"Doctors have told me that I need to lose weight without my asking them."		
Never	244	64.0%
Rarely	33	8.7%
Sometimes	37	9.7%
Usually	29	7.6%
Always	38	10.0%
"I feel that most doctors don't understand how difficult it is to be overweight."		
Never	254	66.7%
Rarely	35	9.2%
Sometimes	36	9.4%
Usually	29	7.6%
Always	27	7.1%

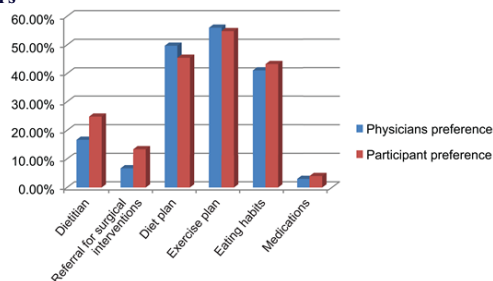
Table 4 measures obese PHC visitors' satisfaction of the weight management practices of their physicians. The percentage of satisfied obese PHC visitors ranges from 46.8% to 65.1%, and the percentage of dissatisfied visitors ranges from 23.0% to 35.1%. The remaining visitors held neutral opinions.

Table 4 Obese PHC visitors' satisfaction with weight management practices

Variable	N	%
"Your doctor's degree of medical expertise concerning your weight"		
Satisfied	239	61.8%
Neutral	48	12.4%
Dissatisfied	100	25.8%
"The overall care your doctor provided you to manage your weight"		
Satisfied	231	59.7%
Neutral	53	13.7%
Dissatisfied	103	26.6%
"The degree to which your doctor explains things about your weight"		
Satisfied	213	55.0%
Neutral	48	12.4%
Dissatisfied	126	32.6%
"How your doctor talks with you about your weight"		
Satisfied	252	65.1%
Neutral	46	11.9%
Dissatisfied	89	23.0%
"The degree to which your doctor listens to you when you discuss your weight"		
Satisfied	241	62.3%
Neutral	50	12.9%
Dissatisfied	96	24.8%
"How well your doctor understands your feelings about your weight"		
Satisfied	231	59.7%
Neutral	50	12.9%
Dissatisfied	106	27.4%
"The amount of time your doctor spends discussing your weight"		
Satisfied	227	58.7%
Neutral	52	13.4%
Dissatisfied	108	27.9%
"How much do you look to your doctor to help you with weight control"		
Satisfied	181	46.8%
Neutral	70	18.1%
Dissatisfied	136	35.1%

In Figure 2, both physicians and visitors recommended diet plans, exercise plans, and eating habits for the management of overweight and obesity. Obese PHC visitors preferred to be referred for surgical intervention more often than physicians preferred.

Figure 2. Methods recommended by physicians versus PHC visitors



The obese PHC visitors' satisfaction was not significantly correlated with depression (Table 5). Good physician practices (Table 6), while significant with some items showed malpractice (time spend for discussion, understanding of feelings, help with weight control) with P-value (0.008, 0.03, 0.007) respectively.

Table 5 Relation of obese PHC visitors' satisfaction of care and depression

Obese PHC visitors' satisfaction of care and depression	
80	International Journal of Scientific Research

Satisfaction with:	Positive depression		Negative depression		Chi-Square p value
	N	%	N	%	
"Your doctor's degree of medical expertise concerning your weight"	143	59.8%	96	40.2%	0.516
"The overall care your doctor provide you to manage your weight"	135	58.4%	96	41.6%	0.142
"The degree to which your doctor explains things about your weight"	125	58.7%	88	41.3%	0.814
"How your doctor talks with you about your weight"	149	59.1%	103	40.9%	0.256
"The degree to which your doctor listens to you when you discuss your weight"	141	58.5%	100	41.5%	0.664
"How well your doctor understands your feelings about your weight"	135	58.4%	96	41.6%	0.870
"The amount of time your doctor spends discussing your weight"	134	59.0%	93	41.0%	0.981
"How much do you look to your doctor to help you with weight control"	103	56.9%	78	41.3%	0.559

*Statistically significant at $p < 0.05$

Table 6 Relation of obese PHC visitors' satisfaction and physicians' malpractice

Obese PHC Visitors Satisfaction of Care and Physician Practice					
Satisfaction with:	Physician Malpractice		Physician Good Practice		Chi-Square p value
	N	%	N	%	
"Your doctor's degree of medical expertise concerning your weight"	207	86.6%	32	13.4%	0.077
"The overall care your doctor provides you to manage your weight"	201	87.0%	30	13.0%	0.073
"The degree to which your doctor explains things about your weight"	186	87.3%	27	12.7%	0.442
"How your doctor talks with you about your weight"	219	86.9%	33	13.1%	0.132
"The degree to which your doctor listens to you when you discuss your weight"	208	86.3%	33	13.7%	0.061
"How well your doctor understands your feelings about your weight"	198	85.7%	33	14.3%	0.030*
"The amount of time your doctor spends discussing your weight"	193	85.0%	34	15.0%	0.008*
"How much do you look to your doctor to help you with weight control"	152	84.0%	29	16.0%	0.007*

Table 7 shows the statistical significance (P-value 0.000) between self-perception and BMI when visitors considered themselves to be overweight, of an ideal weight, or underweight.

Table 7: Relationship between BMI and self-perception:

Self-Perception		BMI		
Category	N	Mean $\pm$ SD	F	ANOVAP- value

Underweight	7	32.8 ± 5.0	22.601	0.000*
Ideal weight	66	29.2 ± 5.0		
Over weight	248	32.7 ± 7.0		
Obese	66	39.2 ± 8.8		

*Statistically significant at $p < 0.05$

a Statistical difference with overweight

b Statistical difference with feeling underweight, ideal weight and overweight

In Table 8, no significant relationship was found between visitors' BMI and depression ($p = 0.9$)

Table 8: Relationship between BMI and depression:

Depression Screening		BMI		
Category	N	Mean ± SD	F	t-test p value
Positive for Depression	227	33.7 ± 7.0	0.013	0.909
Negative for Depression	160	32.5 ± 7.8		

DISCUSSION

Obese PHC visitors' traits

This study shows that two-thirds of PHC visitors were obese (61.46%) whereas 38.54% were overweight, which is not correlated with national and international statistics. Thirty percent of the population in the KSA is obese, according to the Saudi Guideline for the Management of Obesity 2; and 39.8% of the US population is obese (Centers for Disease Control and Prevention, 2015-2016). This could be explained because we only targeted individuals who were overweight and obese.

As in many systematic reviews, there was a coincidence of chronic disease and obesity. Twenty percent of obese PHC visitors were hypertensive, 17% were diabetic, and 19% were smokers, which is less than the percentage of the diseases worldwide (Dare, Mackay, & Pell, 2017; Martin-Rodriguez, Guillen-Grima, Marti, & Brugos-Larumbe, 2015; Schienkiewitz, Mensink, & Scheidt-Nave, 2012). This may be explained by the relative youth of study participants, which a study by Must et al. (1999) estimated at a mean age of 36.

In this study, 1.6% of obese PHC visitors had received a surgical intervention to lose weight, which is very low compared to the number of bariatric surgeries performed in the Middle East in recent years (Welbourn et al., 2018). Possible explanations for this low percentage are that surgical intervention was not discussed as an option or that patients were worried about cost and complications of surgery.

Motivation for weight loss and number of attempts

This study shows a high motivation to lose weight (83.9%), in comparison with the Befort study (Befort, Allen Greiner, Hall, Pulvers, & Nollen, 2006), and a significantly higher number of attempts to lose weight (80.7%) than in one study conducted in the Middle East (26.8%) (Santos, Sniehotta, Marques, Carraça, & Teixeira, 2017) and one international study (36.5%) (Jay, Gillespie, Schlair, Sherman, & Kalet, 2010). This could be attributed to an increased number of attempts as time goes on as is demonstrated in the systematic review (Santos et al., 2017). Despite this high number of attempts, obese PHC visitors failed to achieve control over their weight, which could be due to inappropriate methods or an inadequate duration allotted for weight loss (Befort et al., 2006).

Obese PHC visitors' perceptions regarding weight management Weight management practices in PHCs

The current study shows that most of the obese PHC visitors felt that primary health care programs and services did not support them in the management of their weight. More than half of obese PHC visitors never discussed their weight or were never told they were overweight. This is similar to international studies (Galuska, Will, Serdula, & Ford, 1999; Torti et al., 2017). This may indicate a lack of knowledge of, time, or adequate training in effective weight counseling (Alshammari, 2014; Huang et al., 2004; Ruelaz et al., 2007; Tham & Young, 2008).

Reports of negative interactions

This study shows that most of the obese PHC visitors reported that physicians never criticized them for not trying harder when they lost weight and later regained it. This is consistent with the Wadden study (Wadden et al., 2000), and this can clearly be explained by the lack of discussion about weight management during consultation.

Satisfaction with weight management

Most of the overweight and obese PHC visitors were satisfied with the general care provided to them. This contradicts the Wee study (Wee et al., 2002), which showed that obese patients reported lower levels of satisfaction, compared to normal-weight patients, with most aspects of care during their most recent visit. This could be attributed to the participants of this study not participating in weight management programs but visiting for another clinical issue (Robbins et al., 1993). However, some national studies demonstrated a high level of satisfaction with the services provided in the Kingdom of Saudi Arabia (Almoajel, Fetohi, & Alshamrani, 2014; Mohamed et al., 2015).

Relationship between obese PHC visitors' satisfaction and physician practices

In general, participant satisfaction cannot be linked link to the good practices of physicians if the specific concern of a patient is not addressed during consultation (Robbins et al., 1993). In the present study, most of the participants expressed a high level of satisfaction, though half of them had not been diagnosed as obese. A possible explanation is that the level of satisfaction with the medical care provided was linked to the main reason for their medical visit. This is demonstrated in a study that measured the influence of physician behavior on patient satisfaction (Robbins et al., 1993).

Psychological issues of obese PHC visitors

The participants were underdiagnosed for depression. The number of visitors who tested positive for depression during screening accounted for 58.7% of all visitors. Those who had been diagnosed with depression or anxiety before the screening accounted for only 4.7%. This is consistent with a study done by Michael Udedi in 2014 with an original depression detection rate of zero among patients and eventually 30% of patients in their department being diagnosed as depressed (Udedi, 2014). As this study and many other studies have already demonstrated, there is a poor recognition of depression in PHCs; this may be related to most GPs being poorly trained in recognizing atypical presentations of psychiatric illness and being majorly involved with treating acute and complicated cases in limited time rather than diagnose potential cases of depression (Craven & Bland, 2013; Egede, 2007; Naqvi, 2010). Additionally, depressive symptoms typically appear with weight changes, especially increases in BMI (Joury et al., 2014).

Regarding BMI and rates of depression, there was no significant relationship between obesity and positive screening for depression in the obese PHC visitors. This is dissimilar to Luppino and other studies (Laborde & Sáez-Santiago, 2013; Luppino et al., 2010), which showed that obese persons had a 55% increased risk of developing depression over time. However, the results of these studies cannot be relied upon because researchers used a screening tool rather than a diagnostic tool. Furthermore, the causal direction of the relationship is not clear.

The level of satisfaction with healthcare service is affected by the presence of depression symptoms. Many studies show the positive correlation between levels of dissatisfaction and severity of depressive symptoms (Bair et al., 2007; Bassett, Adelman, Gabbay, & Añel-Tiangco, 2012; Bui, Ostir, Kuo, Freeman, & Goodwin, 2005). However, this study revealed no significant relationship between positive screening for depression and levels of satisfaction with the medical care provided. This result may be related to the instrument used, which did not determine the severity of depressive symptoms. Additionally, according to Joury et al. (2014), most visitors to PHCs in Saudi Arabia had symptoms that ranged from mild mood disturbance to borderline clinical depression.

Obese PHC visitors' self-perception and BMI

There was a significant relationship between self-perception and actual weight. Most of the obese and overweight visitors underestimated their weight, similar to Musaiger, Bin Zaal, and D'souza (2012) which concluded that a high proportion of overweight and obese males and females considered themselves to be of average weight. This may relate to cultural norms, as in a national study, nearly one-third of the study population chose a "little overweight" as the ideal body image for females (Rasheed, 1998). As many studies show, ethnicity, gender, and age all affect perceptions of weight (Altabe, 1998; Chang & Christakis, 2003; de Mola, 2012; Hendley et al. 2011, Jones, Fris, & Danish, 2007; Rucker & Cash, 1992).

Methods for weight management recommended by physicians versus those recommended by obese PHC visitors

The obese PHC visitors preferred to be referred for surgical interventions, at double rate of physicians' preferences. Possibly, these participants were seeking an easy solution or to maximize the benefits of weight loss, as some studies indicate. This may also show the influence of social media and social pressures.

CONCLUSIONS

This study shows obesity is undermanaged and that other common chronic diseases are underdiagnosed in the PHCs in Saudi Arabia, even though obese visitors felt positively about weight management and expressed high levels of satisfaction with the general care provided to them.

Study Strengths

To the best of the researchers' knowledge, this is the first study done in the Kingdom of Saudi Arabia that measures the perception of overweight and obese patients regarding weight management in PHCs. In addition, this is the first study, worldwide, to measure the perception of both genders with different levels of education and socioeconomic status.

- The study focused on overweight and obese visitors only, which resulted in a high response rate.
- Pregnant women were excluded from the study to avoid BMI bias.

Study Limitations

This is a cross-sectional study; so it does not assess the temporal aspect of any issues or establish causative relations between variables.

Recommendations

- Further studies should identify the barriers to obesity management
- Encourage utilization of the Obesity Control Program guidelines released by the Ministry of Health, KSA, in 2016.
- Improve facilities that help manage obesity and encourage collaboration between other healthcare providers, such as dietitians and general surgery, with a clear plan to achieve maximum patient benefit.
- Collaborate with other sectors such as the Ministry of Education, the Ministry of Culture and Information, and the Ministry of Commerce and Investment.
- Understand the cultural ideas underlying self-perception in Saudi Arabia through qualitative research.

Funding:

None.

Conflict of interest

There are no conflicts of interest to declare.

Acknowledgment:

We would like to acknowledge the supervisor, Dr. Areej Alqahtani, for her hard work to complete this project. Special thanks to biostatisticians, Dr. Maha Altawansy. And for Editage for their support.

REFERENCES

1. Al-Baghli, N. A., Al-Ghamdi, A. J., Al-Turki, K. A., El-Zubair, A. G., Al-Ameer, M. M., & Al-Baghli, F. A. (2008). Overweight and obesity in the eastern province of Saudi Arabia. *Saudi Medical Journal*, 29(9), 1319-1325.
2. Almoajel, A., Fetohi, E., & Alshamrani, A. (2014). Patient satisfaction with primary health care in Jubail City, Saudi Arabia. *World Journal of Medical Sciences*, 11(2), 255-264.
3. Alshammari, Y. F. F. (2014). Attitudes and practices of primary care physicians in the management of overweight and obesity in eastern Saudi Arabia. *International Journal of Health Sciences*, 8(2), 151.
4. Altube, M. (1998). Ethnicity and body image: Quantitative and qualitative analysis. *International Journal of Eating Disorders*, 23(2), 153-159.
5. Bair, M. J., Kroenke, K., Sutherland, J. M., McCoy, K. D., Harris, H., & McHorney, C. A. (2007). Effects of depression and pain severity on satisfaction in medical outpatients: analysis of the Medical Outcomes Study. *Journal of Rehabilitation Research & Development*, 44(2), 143-152.
6. Bassett, J., Adelman, A., Gabbay, R., & Añel-Tiangco, R. M. (2012). Relationship between depression and treatment satisfaction among patients with type 2 diabetes. *Journal of Diabetes & Metabolism*, 3(7), 210.
7. Befort, C. A., Allen Greiner, K., Hall, S., Pulvers, K. M., Nollen, N. L., Charbonneau, A., ... & Ahluwalia, J. S. (2006). Weight-related perceptions among patients and physicians: how well do physicians judge patients' motivation to lose weight? *Journal of General Internal Medicine*, 21(10), 1086-1090.
8. Bui, Q. U. T., Ostir, G. V., Kuo, Y. F., Freeman, J., & Goodwin, J. S. (2005). Relationship of depression to patient satisfaction: findings from the barriers to breast cancer study. *Breast Cancer Research and Treatment*, 89(1), 23-28.
9. Brown, I., Thompson, J., Tod, A., & Jones, G. (2006). Primary care support for tackling obesity: a qualitative study of the perceptions of obese patients. *British Journal of General Practice*, 56(530), 666-672.
10. Centers for Disease Control and Prevention (n.d.). Adult obesity facts. Retrieved January 29, 2019, <https://www.cdc.gov/obesity/data/adult.html>
11. Chang, V. W., & Christakis, N. A. (2003). Self-perception of weight appropriateness in the United States. *American Journal of Preventive Medicine*, 24(4), 332-339.
12. Craven, M. A., & Bland, R. (2013). Depression in primary care: current and future challenges. *The Canadian Journal of Psychiatry*, 58(8), 442-448.
13. Dare, S., Mackay, D. F., & Pell, J. P. (2017). Correction: relationship between smoking and obesity: a cross-sectional study of 499,504 middle-aged adults in the UK general population. *PLoS One*, 12(2), e0172076.
14. de Mola, C. L., Pillay, T. D., Diez-Canseco, F., Gilman, R. H., Smeeth, L., & Miranda, J. J. (2012). Body mass index and self-perception of overweight and obesity in rural, urban and rural-to-urban migrants: PERU MIGRANT study. *PLoS One*, 7(11), e50252.
15. Egede, L. E. (2007). Failure to recognize depression in primary care: issues and challenges. *Journal of General Internal Medicine*, 22, 701-703.
16. Fan, V. S., Burman, M., McDonnell, M. B., & Fihn, S. D. (2005). Continuity of care and other determinants of patient satisfaction with primary care. *Journal of General Internal Medicine*, 20(3), 226-233.
17. Galuska, D. A., Will, J. C., Serdula, M. K., & Ford, E. S. (1999). Are health care professionals advising obese patients to lose weight? *JAMA*, 282(16), 1576-1578.
18. Hendley, Y., Zhao, L., Coverson, D. L., Din-Dzietham, R., Morris, A., Quyyumi, A. A., ... & Vaccarino, V. (2011). Differences in weight perception among blacks and whites. *Journal of Women's Health*, 20(12), 1805-1811.
19. Huang, J., Yu, H., Marin, E., Brock, S., Carden, D., & Davis, T. (2004). Physicians' weight loss counseling in two public hospital primary care clinics. *Academic Medicine*, 79(2), 156-161.
20. Jay, M., Gillespie, C., Schlair, S., Sherman, S., & Kalet, A. (2010). Physicians' use of the 5As in counseling obese patients: is the quality of counseling associated with patients' motivation and intention to lose weight? *BMC Health Services Research*, 10(1), 159.
21. Joury, A. U., AlAtmi, A. A., AlBabtain, S. A., Alsharif, M., AlBabtain, N. A., Mogbil, A. B., & AlRuwaili, M. A. (2014). Prevalence of depression and its association with socio-demographic characteristics among the general population. *International Journal of Modern and Alternative Medicine Research*, 2, 8-15.
22. Jones, L. R., Fries, E., & Danish, S. J. (2007). Gender and ethnic differences in body image and opposite sex figure preferences of rural adolescents. *Body image*, 4(1), 103-108.
23. Laborde, J. E., & Sáez-Santiago, E. (2013). Association between obesity and symptoms of depression of adults in Puerto Rico. *Puerto Rico health sciences journal*, 32(3), 132-137.
24. La Vela, S. L., & Gallan, A. (2014). Evaluation and measurement of patient experience. *Patient Experience Journal*, 1, 28-36.
25. Luppino, F. S., de Wit, L. M., Bouvy, P. F., Stijnen, T., Cuijpers, P., Penninx, B. W., & Zitman, F. G. (2010). Overweight, obesity, and depression: a systematic review and meta-analysis of longitudinal studies. *Archives of General Psychiatry*, 67(3), 220-229.
26. Naqvi, H. A. (2010). Primary care psychiatry in Pakistan: Issues and challenges. *JPMA-Journal of the Pakistan Medical Association*, 60(10), 794.
27. Martin-Rodriguez, E., Guillen-Grima, F., Martí, A., & Brugos-Larumbe, A. (2015). Comorbidity associated with obesity in a large population: The APNA study. *Obesity Research & Clinical Practice*, 9(5), 435-447.
28. Maurer, D. M. (2012). Screening for depression. *American Family Physician*, 85, 139-144.
29. Memish, Z. A., El Bcheraoui, C., Tuffaha, M., Robinson, M., Daoud, F., Jaber, S., ... & Al Rabeeah, A. A. (2014). Peer reviewed: Obesity and associated factors—Kingdom of Saudi Arabia, 2013. *Preventing Chronic Disease*, 11, E174.
30. Ministry of Health. (2017) Retrieved from: <https://www.moh.gov.sa/OCP/Documents/001.pdf>
31. Mohamed, E. Y., Sami, W., Alotaibi, A., Alfarag, A., Almutairi, A., & Alanzi, F. (2015). Patients' satisfaction with primary health care Centers' Services, Majmaah, kingdom of Saudi of Saudi Arabia. *International Journal of Health Sciences*, 9(2), 163.
32. Mugaier, A. O., Bin Zaal, A. A., & D'souza, R. (2012). Body weight perception among adolescents in Dubai, United Arab Emirates. *Nutricion Hospitalaria*, 27(6), 1966-1972.
33. Musich, S., MacLeod, S., Bhattarai, G. R., Wang, S. S., Hawkins, K., Bottone Jr, F. G., & Yeh, C. S. (2016). The impact of obesity on health care utilization and expenditures in a Medicare supplement population. *Gerontology and Geriatric Medicine*, 2, 2333721415622004.
34. Must, A., Spadano, J., Coakley, E. H., Field, A. E., Colditz, G., & Dietz, W. H. (1999). The disease burden associated with overweight and obesity. *JAMA*, 282(16), 1523-1529.
35. Rasheed, P. (1998). Perception of body weight and self-reported eating and exercise behaviour among obese and non-obese women in Saudi Arabia. *Public Health*, 112(6), 409-414.
36. Robbins, J. A., Bertakis, K. D., Helms, L. J., Azari, R., Callahan, E. J., & Creten, D. A. (1993). The influence of physician practice behaviors on patient satisfaction. *Family Medicine-Kansas City*, 25, 17-17.
37. Rucker III, C. E., & Cash, T. F. (1992). Body images, body size perceptions, and eating behaviors among African American and white college women. *International Journal of Eating Disorders*, 12(3), 291-299.
38. Ruelaz, A. R., Diefenbach, P., Simon, B., Lanto, A., Arterburn, D., & Shekelle, P. G. (2007). Perceived barriers to weight management in primary care—perspectives of patients and providers. *Journal of General Internal Medicine*, 22(4), 518-522.
39. Santos, I., Sniehotka, F. F., Marques, M. M., Carraça, E. V., & Teixeira, P. J. (2017). Prevalence of personal weight control attempts in adults: a systematic review and meta-analysis. *Obesity Reviews*, 18(1), 32-50.
40. Schienkiewitz, A., Mensink, G. B., & Scheidt-Nave, C. (2012). Comorbidity of overweight and obesity in a nationally representative sample of German adults aged 18-79 years. *BMC Public Health*, 12(1), 658.
41. Tan, D., Zwar, N. A., Dennis, S. M., & Vagholkar, S. (2006). Weight management in general practice: what do patients want? *Medical Journal of Australia*, 185(2), 73.
42. Tham, M., & Young, D. (2008). The role of the General Practitioner in weight management in primary care—a cross sectional study in General Practice. *BMC Family Practice*, 9(1), 66.
43. Torti, J., Luig, T., Borowitz, M., Johnson, J. A., Sharma, A. M., & Campbell-Scherer, D. L. (2017). The 5As team patient study: patient perspectives on the role of primary care in obesity management. *BMC family practice*, 18(1), 19.
44. Udedi, M. (2014). The prevalence of depression among patients and its detection by primary health care workers at Matawale Health Centre (Zomba). *Malawi Medical Journal*, 26(2), 34-37.
45. Wadden, T. A., Anderson, D. A., Foster, G. D., Bennett, A., Steinberg, C., & Sarwer, D. B. (2000). Obese women's perceptions of their physicians' weight management attitudes and practices. *Archives of Family Medicine*, 9(9), 854.
46. Wee, C. C., Phillips, R. S., Cook, E. F., Haas, J. S., Puopolo, A. L., Brennan, T. A., & Burstin, H. R. (2002). Influence of body weight on patients' satisfaction with ambulatory care. *Journal of General Internal Medicine*, 17(2), 155-159.
47. Welbourn, R., Pournaras, D. J., Dixon, J., Higa, K., Kinsman, R., Ottosson, J., ... & Zundel, N. (2018). Bariatric surgery worldwide: baseline demographic description and one-year outcomes from the Second IFSGO Global Registry Report 2013–2015. *Obesity surgery*, 28(2), 313-322.
48. World Health Organization. (n.d.). Obesity. Retrieved January 29, 2019, <http://www.who.int/topics/obesity/en/>