FREQUENCY AWARENESS AND MANAGEMENT OF OBESITY AMONG HEALTHCARE PROVIDERS

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ABSTRACT

Introduction*: Obesity is a growing public health problem all over the world. To create a healthy generation and for health promotion, obesity must be more emphasised among healthcare providers and policy makers. The aim of this study was to evaluate the frequency, awareness and self-management of obesity among healthcare providers. This study also evaluated whether socio-demographic factors influence obesity and obesity awareness and management among the participants.*

Material and methods*: The study was cross-sectional; the research was conducted with 493 healthcare providers. The study group ranged in age from 18-57 years. The survey questions were prepared using the World Health Organisation (WHO) STEP wise approach to noncommunicable disease risk factor surveillance.*

Results*: The frequency of obesity among healthcare providers was 14.9%. Obesity risks were 3.361 fold (95% CI, 1.996-5.727) higher in older age groups than younger. There was no significant relationship identified between obesity and gender. A relatively low educational level meant a 2.688-fold (95% CI, 1.590-4.546) increase in the risk of obesity. The obesity rate was significantly higher in married participants and significantly lower in childless participants. The frequency of obesity by occupation was 16% for doctors, 1% for nurses, 13% for permanent medical staff, and 22% for medical information technology staff. A higher rate of eating a regular balanced diet was observed in doctors. It was observed that cigarette smoking increased the risk of obesity 1.852-fold (95% CI, 1.282.2.973).*

Conclusion*: Although obesity awareness was low among all healthcare providers, the frequency of obesity was lower than the general population in this study group.*

Keywords*: awareness, education, health personnel, obesity.*

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Introduction

In the human body, excess energy is stored as fat in the adipose tissue to be used in case of an energy deficit[1]. Obesity is defined as excessive fat accumulation in the body as a result of getting more calories than consumed energy. The prevalence of obesity is on the increase in every country, both developing and developed[2]. According to the World Health Organisation's (WHO) data, more than half of the world's population is overweight and obese[2]. Furthermore, the prevalence of obesity in Turkey has been reported as 32% in 2014[3].

It is well-known that obesity reduces life expectancy, decreases the quality of life and increases the risk of premature death[2,4,5]. In several studies it has been demonstrated that obese individuals have more physical and mental health problems, such as cardiovascular diseases, diabetes mellitus, kidney disease, breathing problems, osteoarthritis, malignancy, clinical depression, and anxiety, than people of a healthy weight[6-8].

In addition to healthy diets WHO suggest that regular physical activity to prevent and manage the current epidemic of obesity[2]. It has also been proved that aerobic and resistance training reduced

fat mass in overweight subjects[9,10]. Obesity threatens public health more than communicable diseases in the present world and more death occurs among obese people than people of normal weight[2]. The economic dimension of obesity is devastating because of reduced personal economic productivity due to impaired health and the treatment cost of the diseases caused by obesity[11]. Healthcare providers, especially in primary care, have a great role in the control and management of obesity and improving health outcomes. All healthcare staff have a responsibility to prevent this growing public health problem[12].

Health professionals are expected to exemplify appropriate health practices in their personal life as role models and for their own health. Moreover, it has been clearly shown that health professionals' weight status affects their attitudes towards weight management of the patient[12]. The aim of this study was to evaluate the frequency, awareness and self-management of obesity among healthcare providers. This study also tested whether the socio-demographic factors influence obesity and obesity awareness and management in participants.

Material and methods

This cross-sectional research, which was conducted from October 2016 to February 2017, examined 502 healthcare workers in the Research and Application Hospital of the Kafkas University School of Medicine. The hospital, which has 265 active in-patient beds, opened in 2011 in Kars Province of the North Eastern Anatolia Region of Turkey and is still developing. Kars population was 289.786 in the 2016 census[13]. The study was approved by the Kafkas University Medical Faculty Ethics Committee (protocol number: 050-99/110), and verbal informed consent was obtained from all participants. Data were collected through face-to-face interviews. The total number of healthcare workers were 502 (the universe of study).

The sample size was not calculated and all of the workers included to survey. In the course of events, nine participants were removed from the survey because they did not complete the questionnaire form and the study was completed with 493 participants (154 doctors, 74 nurses, 202 permanent medical staff, and 63 medical information technology staff). All of the nine participants belonged to a permanent medical staff group (this group include medical secretary, medical officer, and medical management staff.). An 8-item questionnaire form consisting of open- and close-ended questions to assess the socio-demographic characteristics (age, gender, level of education, occupation, marital status, number of children, living arrangement, number of persons living with the respondent, work duration) and smoking habit. We divided the participants by age for the analysis into two groups: 32 or younger and 33 or older, according to mean age of the subjects. For the analysis, education levels were dichotomised as high school vs. university and above. Occupation was dichotomised for Omnibus and Hosmer-Lemeshow tests as doctor and nurse vs permanent medical staff and medical information technology staff. Living arrangements were dichotomised as one (living alone) versus two or more. Marital status was dichotomised as married and others. Number of children was dichotomised as none vs one or more, according to mean number of children. Work duration was dichotomised as six years and less vs seven years and more, according to mean work duration. Cigarette smoking was examined without questioning the amount or duration and dichotomised as “yes” or “no”. A 7-item questionnaire form to assess obesity awareness and management was used as a data collection tool.

The answers were dichotomised for the analysis as “yes” or “no”. The “yes” indicated “positive” results for obesity awareness and management. To evaluate that awareness regarding obesity, three simple question were directed to participants. The first one is, “Do you know/accept that obesity is the main reason for many health problems and health-threatening situations” (it is stated as “obesity perspective” in tables and text). The second question is, “Do you think that you have the optimal weight for your body” (it is stated as “body weight perception” in tables and text). The third question was about the existence of an overweight or obese person in the family of the participants. To examine obesity management, there were inquiries about “endeavour to lose weight”, “frequency of monitoring weight control” (four times in a month accepted as frequent monitoring for weight control and defined as “yes” and less than three in a month accepted as infrequent monitoring of weight control and defined as “no”), “having regular physical activity”, and “having regular-balanced diet”. The survey questions were prepared using the World Health Organisation (WHO) STEPwise approach to Surveillance of noncommunicable diseases[14].

Appropriately to the purpose of this research, no "book" knowledge question about obesity was used to assess obesity awareness and management. The bio-electrical impedance analysis (BIA) was used to examine the body composition of the participants. The Hospital Body Composition Analyzer was used for the BIA (The Jawon X-Scan Plus 2R)[15]. Of the measurements only body mass index (BMI) results were used in the current survey (because there were no participants of older age, which means there was no length decrease due to getting older and thus false results of BMI).

The BMI was classified according to the World Health Organization guidelines: Underweight (<18.5kg/m^2), normal weight (18.5-24.9 kg/m^2), preobese (overweight) (25-29.9 kg/m^2), obesity class I/moderate obesity (30-34.9 kg/m^2), and obesity class II/severe obesity (≥35 kg/m^2). For comparisons, BMI was classified as non-obese (≤ 29.9 kg/m^2) and obese (≥ 30.0 kg/m^2)[16].

Statistical analysis

We used SPSS 20.0 (University of Kafkas, IP number 194.27.41.6) software for data analysis. We employed descriptive statistics to examine percentage distributions, frequencies, arithmetic means, and standard deviations (SD). According to the type of variable (continuous or categorical), we described the participants' characteristics by means and SD or frequencies and percentages, respectively. To compare variables, we used Pearson's chi-squared and Fisher's exact tests. We used logistic regression analysis to identify independent variables affecting obesity. We adjusted data for age and gender. We employed the Hosmer-Lemeshow test for measures of the fit of the data for logistic regression analysis and the Omnibus test to determine the significance of model coefficients. We calculated the odds ratio (OR) values between the categorical variables for risk evaluation and determined the 95% confidence interval (CI) of the OR values. We set the threshold for statistical significance at $p < 0.05$.

Results

The analysis was conducted with 493 cases. According to body mass index, 14.9% of the subjects were obese and 48.3% were overweight of the healthcare providers. The study group members were aged between 18 and 57 years (31.33 ±8.35), and 47.1% were women. Percentage of the participants with university education level and above was 53.1%. There were no subjects with educational level of less than high school. The frequency of occupation in the study group was 31.0% doctor, 15.5% nurse, 41.6% permanent medical staff, and 13.8% medical information technology staff. Fifty-two percent of the subjects were married. The rate of living alone was 13.6% in the study group. Fifty-three percent of the participants have no child. The mean number of children at subjects' home was 0.84 (min:0, max:5, SD:1.06). The percentage of participants whose living alone was 13.6%. The mean number of persons living with the respondents was 3.27 (min:1, max:7, SD:1.45). The study group ranged in work duration from 1-30 years (mean,5.87 ± 5.62 years). In sixty-four percent of the subjects, the duration of the work was less than six years. The percentage of cigarette smokers was 26.2%. The mean BMI of the participants was 24±4.13 (min: 16, max: 40). Only one person has 40 kg/m2 of BMI. The percentage of BMI over 35 kg/m2 was 1.8%. Table 1 has the percentages and frequencies of the socio-demographic characteristics (Table 1).

We found a significant relationship between obesity and the age groups. In older age groups the obesity rate was statistically significantly higher. There was no significant relationship identified between obesity and gender. We found a significant relationship between educational level and obesity. In participants who had a university education and higher, the obesity rate was statistically significantly low. A significant relationship was found between obesity and marital status. The obesity rate was significantly higher among married participants. Significant relationships were also detected between obesity and number of children. The obesity rate was low in childless participants. We did not identify any significant relationship between obesity and living arrangement.

A statistically significant difference was found between obesity and the work duration of the subjects. The obesity rate was higher in participants with seven years and more work duration. The frequency of obesity was significantly higher among smokers. The last column of table 1 contains participants' socio-demographic characteristics and their relationship with obesity (Table 1).

The frequency of obesity according to occupation was 16% in doctors, 1% in nurses, 13% in permanent medical staff, and 22% in medical informa-

tion technology staff. A lower obesity rate in nurses and a higher obesity rate in medical information technology staff were observed. The percentage of the participants who know/accept that obesity is the main reason for many health problems was 67.3. Sixty-three of the participants were obese and overweight and thirty-five percent of the participants consider that they have the optimal weight for their body.

Characteristic (n=493)		n	%	min	max	mean	SD	p (BMI)
Age	≤32	285	57.8	18	57	31.33	8.35	**<0.0001**
	≥33	208	42.2					
Gender	Female	232	47.1			0.218		
	Male	261	52.9					
Education Level	University&↑	262	53.1					**0.019**
	High school	231	46.9					
Occupation	Doctor	153	31.0					0.630
	Nurse	74	15.5					0.201
	PMS*	205	41.6					0.177
	MITS**	68	13.8					0.059
Marital Status	Married	257	52.1					**<0.0001**
	Other	236	47.9					
Number of Children	None	262	53.1	0	5	0.84	1.06	**0.016**
	One&↑	230	46.7					
Living Arrangement	Alone	67	13.6	1	7	3.27	1.45	0.095
	Two&↑	426	86.4					
Work Duration	≤6	316	64.1	1	30	5.87	5.62	0.024
	≥7	176	35.7					
Cigarette Smoking	Yes	129	26.2					0.021
	No	364	71.2					
BMI	≥30	73	14.9	16	40	24.85	4.13	<0.0001
	≤29	417	85.1					

n: frequency %:percentage SD: Standard Deviation, p:level of significance (<0.05), Data are shown as mean± SD, BMI Scores: ≥30 "obese", ≤29: "non-obese" The mean BMI: 24.85±4.13(min:16, max:40), *PMS: Permanent Medical Staff, **MITS: Medical Information Technology Staff.

Table 1: Socio-demographic characteristics of the participants and their relationship with Body Mass Index (BMI) Scores.

According to the self-declaration of the subjects, the percentage of overweight or obese persons in their own family was 28.8. The percentage of participants which endeavour to lose weight was 26.6%. Thirty-six percent of the participants declared they frequently monitored weight control. The frequency of regular physical activity was 41.4% in participants. The rate of regular balanced diet was 59.6% in the study group. The highest rate of regular balanced diet was observed among doctors (68%). Obesity perspective was higher in nurses than other healthcare providers. The frequency of obesity awareness and management according to age, gender and occupation are presented in table 2. (Table 2).

When the relationship between socio-demographic characteristics and obesity awareness and management was examined, it was seen that relatively younger age groups have significantly higher rates of all the dimensions of awareness management, except "regular physical activity" and "regular balanced diet". The female gender has a statistically significant relationship with the "endeavour to lose weight". A statistically significant relationship was found between the medical information technology staff and all dimensions of obesity management. Doctors only reported that they had significantly higher rates of "regular balance diet". We found a significant relationship between obesity awareness and non-smoking. We did not identify any significant relationship between obesity and frequency of monitoring weight control in this study group. The obesity rate was significantly low in physically active participants. There was no significant relationship identified between obesity and self-reported regular balanced diet. The relationship between socio-demographic characteristics and obesity awareness and management are broadly presented in table 3 (Table 3).

The Omnibus test showed that the model coefficients were statistically significant ($p<0.05$). The Hosmer Lemeshow test showed a data goodness of fit for the logistic regression analysis ($p>0.05$) (Table 4). In the logistic regression analysis results, a significant relationship was observed between obesity and the characteristics of age groups, marital status, education level, work duration and smoking (Table 5). The exponentials of the other independent variables were not significant according to the logistic regression analysis. The obesity risks were 3.361 fold (95% CI, 1.996-5.727) higher in older age groups than younger ones. It was seen that a relatively low educational level increased the risk of obesity 2.688-fold (95% CI, 1.590-4.546). The risk of obesity with marital status was 2.816-fold (95% CI,

1.705-4.651) higher in married participants. The obesity risks were 1.737 fold (95% CI, 1.051-2.873) higher in participants who have work duration longer than seven years. It was observed that cigarette smoking increased the risk of obesity 1.852-fold (95% CI, 1.282.2.973) (Tables 5).

	Occupation					
Awareness & Management n=493, 100%	**Age** ≤32 ≥33	**Gender** Female Male	**Doctor** n=153 %	**Nurse** n=74 %	**PMS*** n=205 %	**MITS**** n=68 %
Obesity n=73, 14.9%	n=24 n=49 33% 67%	n=31 n=42 42% 58%	2416	8 1	26 13	15 22
Obesity Perspective n=332, 67%	n=202 n=130 61%39%	n=153 n=179 46% 54%	109 71	54 73	133 65	44 65
Body Weight Perception n=172, 35%	n=82 n=90 48% 52%	n=73 n=99 42% 58%	52 34	22 30	71 35	27 40
Obese Relatives of the Participants n=142, 29%	n=69 n=73 49% 51%	n=62 n=80 44% 56%	36 24	21 28	62 30	23 34
Endeavourto Lost Weight n=131, 27%	n=50n=81 38% 52%	n=51 n=80 39% 61%	38 25	19 26	48 23	29 43
Frequency of Weight Control n=176, 36%	n=107 n=69 61% 39%	n=79 n=97 45% 55%	59 39	28 38	62 30	27 40
Regular Physical Activity n=204, 41%	n=11 n=91 55% 45%	n=90 n=114 44% 56%	48 31	29 39	90 44	54 37
Regular - Balanced Diet n=294, 60%	n=17 n=121 59% 41%	n=143 n=151 49% 51%	104 68	45 61	112 55	33 49
n (frequency) and % (percentage)shows only positive "yes" results of obesity regarding awareness and management, *PMS: Permanent Medical Staff, **MITS: Medical Information Technology Staff						

Table 2: The frequency of obesity awareness and management according to age, gender and occupation.

Table 3. Obesity awareness - management and their relationship with socio-demographic characteristics

Characteristic	Obesity Regarding Awareness			Obesity Regarding Management			
	Q:1 OP	Q:2 BWP	Q:3 ORSH	Q:4 ELW	Q:5 FWC	Q:6 RPA	Q:7 RBD
	p	p	p	p	p	p	p
Age 32- 33	**0.032**	**0.006**	**0.001**	**<0.0001**	**0.183**	0.206	0.318
Gender Female- Male	0.299	0.195	0.079	**0.019**	0.266	0.157	0.233
Education Level University-H.Sc.	0.355	**0.002**	**0.018**	**0.034**	**0.093**	**<0.0001**	0.246
Doctor	0.958	0.976	0.730	0.791	0.291	0.530	**0.027**
Nurse	0.162	0.526	0.191	0.488	0.345	0.389	0.464
PMS	0.244	0.310	0.501	0.108	**0.032**	0.193	0.188
MITS	0.356	0.199	0.222	**0.001**	**0.001**	**0.014**	**0.031**
Marital Status Married - Single	0.456	**<0.0001**	**<0.0001**	**<0.0001**	0.270	0.173	**0.036**
Number of C None- One&↑	0.500	0.180	**0.013**	**0.002**	0.167	0.248	0.091
Living Arrang. Single-Two &↑	0.353	**0.021**	0.088	**0.012**	**<0.0001**	0.478	**<0.0001**
Work Duration ≤6-≥7 years	**0.015**	0.286	0.058	**0.006**	0.142	0.121	0.204
Smoking Yes-No	**0.035**	**<0.0001**	**<0.0001**	**0.048**	0.171	**<0.0001**	**0.001**
Obesity ≥30-<29	**0.038**	**<0.0001**	**<0.0001**	**<0.0001**	0.533	**<0.0001**	0.207

Question 1: Obesity Perspective (OP), Question 2: Body Weight Perception (BWP), Question 3: Obese Relatives at Subject's Home (ORSH), Question 4: Endeavour Lost Weight (ELW), Question 5: Frequency of Weight Control (FWC), Question 6: Regular Physical Activity (RPA), Question 7: Regular Balanced Diet (RBD).

Discussion

In the current study, the frequency of obesity was found to be relatively low among healthcare providers (14.9%). However, the rate of overweight was higher in the participants (48.3%). It was seen that 2/3 of the participants were obese and overweight in total. According to different studies from all over the world, rates of obesity range from 15% to 27% in the healthcare workers[17-19]. The authors of a Turkish study reported the frequency of abdominal obesity as 13.8% in healthcare workers[20]. Thirty-five percent of the participants consider that they have the optimal weight for their body. According to this result it seems that body weight perception of the subject is right.

In our study the lower obesity rate was in nurses and the higher obesity rate was in medical information technology staff. Furthermore, obesity perspective was higher in nurses than other healthcare providers. However, no obesity risk was found with occupation. Obesity risk has been found to be higher in participants who are relatively older, married, relatively less educated and smokers. The current study findings show a low percentage of obesity awareness and management among all healthcare providers; even in doctors, the frequency of obesity was found to be half less than the country's general population (32%). These results considered that the study group has better management for obesity than they have reported. This is the first study carried out in this region of Turkey.

The Kars province is placed in the North-Eastern Region of Turkey, a relatively undeveloped part of the country. This city is in the Caucasus region, a place known for its harsh weather and living conditions and a long winter. In the Kars Province, 56.95% of the population lives in rural areas; nationwide, the average percentage of the population living in rural areas is 22.72%[13]. The diet habits of the local people are mostly based on pastry and animal product. Although there was no published study that shows the prevalence of obesity in this city, the observed obesity rate is high. The healthcare workers are mostly from the local population, except for doctors in the study hospital. For this reason, the current study was also targeted towards drawing attention to obesity and increasing the awareness about obesity in hospital workers.

Despite the growing public health problem of obesity, it is important to emphasise that obesity is prevented if weight management is adequately addressed among healthcare workers. All health promoting strategies should be aimed at educating people about a healthy lifestyle. People can learn that self-efficacy about their health via healthcare

workers and healthcare providers see their self-efficacy to capable overcome obesity epidemic via increasing knowledge and awareness about obesity[21].

Dependent variables	Independent variables	-2 Log-likelihood	Chi-Square χ^2	Omnibus p
Obesity (No:0,Yes:1)	Age	1093.246	98.061	**0.003**
	Gender			
	Education Level			
	Occupation*			
	Marital Status			
	Number of children			
	Living Arrangement			
	Work Duration			
	Cigarette Smoking			
	BMI			
Hosmer-Lemeshow χ^2 (Chi-Square)	**df****		**p**	
10.153	**8**		**0.138**	
***The occupation was dichotomised as doctor and nurse vs permanent medical staff and medical information technology staff,**df: degree of freedom**				

Table 4: The results of Omnibus and Hosmer-Lemeshow tests.

Socio-demographic characteristics	Exp (B)*	B	SD Standard Deviation	p	95% Confidence Interval	
					Minimum	Maximum
Constant	2.381	0.902	0.554	0.106	-	-
Age(≥33)*	**3.361**	0.852	0.38	**0.001**	**1.996**	**5.727**
Gender (Female)*	1.261	0.82	1.142	0.218	0.763	2.083
Education Level (University&↑)	**2.688**	-1.486	1.063	**0.001**	**1.59**	**4.546**
Occupation (Doctor &Nurse)	0.687	0.302	0.196	0.117	0.416	1.021
Marital Status (Married)	**2.816**	0.887	0.312	**0.011**	**1.205**	**4.651**
Number of children (one or more)	1.183	-0.364	0.217	0.086	0.513	2.042
Living Arrangement (two or more)	1.913	0.646	0.193	0.095	0.695	4.805
Work Duration (≥7)	**1.737**	0.412	0.171	**0.013**	**1.251**	**2.873**
Cigarette Smoking (Yes)	**1.852**	0.541	0.183	**0.007**	**1.182**	**2.973**
"Exponential Base, **The data were adjusted for age and gender, p<0.05.						

Table 5: Logistic regression analysis between the socio-demographic characteristics and obesity.

For this reason, healthy living habits and nutrition education in medical school is crucial[22]. Besides this curriculum, a life-long education program must be constituted among healthcare workers. It is essential to build sustainable strategies for a healthy lifestyle. Public health policies should be established to prevent and avoid overweight and obesity in every age group.

The policy makers in public health services should build sustainable strategies for a healthy environment for physical activity and non-processed (raw) food for a healthy diet[23].

A pleasing result of this study is the relatively low frequency of obesity among healthcare providers. But, in the current study group, the participants were of a younger age range. This situation could be the reason for the low prevalence of obesity. Furthermore, it has been found that the younger participants have a low obesity rate. However, the overweight rate was high. It shows that prevention must be taken before it is late. In a Hungarian study, the authors reported that relatively older doctors did not describe obesity as a pathologic condition[24]. Obesity is considered a top public health concern, due to the high level of morbidity and mortality in the United States[25]. In creating a healthy generation and promoting health, the healthcare providers and policy makers have a great role and responsibility. Improving health outcomes mainly depends on health professionals. To promote healthy living in society, healthcare workers have to be educated to practise appropriate health behaviours in their personal life[26].

In this context the healthcare workers have to receive a special training for weight management. In the current study we aimed to increase awareness about obesity in our hospital workers. This study was a small part of our training effort. As we have determined that more educated healthcare workers are less obese, we have been planning a series of training programs for healthcare workers in our hospital. We believe that this study will be utilised to facilitate the design of weight management education programs for healthcare workers across the country. Obesity can be addressed by changes in human behaviour. Besides policy makers, healthcare providers have an important role in the prevention and management of obesity. It is essential to build sustainable strategies for a healthy lifestyle. This could be possible with only education. Healthcare providers could reconstruct the essential chain between production and consumption via being a role-model.

Limitation and strength of the study

The current study examines the measurement of obesity awareness and management based on self-reporting of healthcare providers without using

any objective measure like an index which is evident for reliability and validity. This is one of the limitations of our study. Another limitation is that the sample of this study is limited to a hospital. Our research was not based on a nationwide sample of Turkey's healthcare providers. Therefore, the sample's national representation is poor and it could not be generalised to other healthcare providers of Turkey. The power of this study was that it included all of the hospital workers. In addition, this is the first study carried out in this part of the world.

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