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Research Article

PREVALENCE OF OBESITY AMONG THE ELDERLY POPULATION AND ITS ASSOCIATION WITH CHRONIC DISEASES OBESITY IN TAIF, SAUDI ARABIA

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Abstract:

Introduction: Malnutrition and obesity are principal health problems globally, as they cause a series of critical complications and have an effect on the quality of life. **Methodology:** This was a cross-sectional study conducted in Taif, Saudi Arabia. The study aimed to assess the prevalence of obesity among the elderly population and its association with various chronic diseases, using BMI as a screening tool. The sample was obtained from primary healthcare center visitors. **Results:** A total of 341 participants were included in this study; over half of them (57.1%) were females and with a mean age of 67.1±9.5. The prevalence of obesity was (45.6%). We found a significant association between cardiovascular diseases ($P=0.043$), thyroid diseases ($P=0.001$), chronic ear diseases ($P=0.026$) and respiratory diseases ($P=0.013$) among the elderly population and obesity. **Conclusion:** Our study reported a relatively high prevalence of obesity among the elderly population. We found a significant association between obesity and the elderly participants with cardiovascular diseases, thyroid diseases, chronic ear infections and respiratory diseases.

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INTRODUCTION:

Obesity is a public health problem in developed and developing countries. Many studies have reported a trending increase in the prevalence of obesity throughout the world; this increase was observed among both men and women, affecting all age groups and all educational levels [1]. The World Health Organization (WHO) has reported that obesity prevalence has duplicated since 1980 [2]. Some authors have discussed that nearly one-third of the life expectancy profits over time is assignable to public health achievements, including the simultaneous increase in obesity prevalence. Obesity has been associated with higher rates of disability and overall poor health among older adults [2, 3].

According to the world population prospects reported by the department of economic and social affairs of the United Nations, the world's population was 7.7 billion in mid-2019. For the first time in history, individuals aged 65 years or more outnumbered children aging under five years in 2018. Regarding the life expectancy at birth for the world's population, it reached 72.6 years in 2019, a development of more than eight years in 1990. In 2050, further development in survival is expected to result in an average global life expectancy of nearly 77.1 years [4]. In Saudi Arabia, and around the period from 2016-2030, the country is aiming to enhance life expectancy at birth by six years, from 74 to 80, with an average gain of 0.43 years annually [5].

Global health problems for the elderly comprise nutritional issues, chronic non-communicable diseases such as cardiovascular diseases and stroke. Nutritional problems, particularly under-nutrition, are one of the most prevalent public health problems among the elderly population causing higher mortality rates and economic losses in developing countries [6].

Obesity and malnutrition are both predominant health conditions throughout the world, as they cause a series of critical complications and markedly affect the quality of life. As overweight and obesity are considered as abnormal excessive fat accumulation that becomes a critical risk to health, the body mass index (BMI) is a simple index of weight-for-height that is prevalent to be used to categorize underweight, overweight and obesity in adults. It is determined as the weight in kilograms divided by the square of height in meters (kg/m^2). An individual with a BMI of ≥ 25 is regarded by WHO as overweight, while obesity is determined as scoring a BMI of ≥ 30 [7].

Obesity and overweight are both influential risk factors for cardiovascular diseases and type 2 diabetes mellitus (T2DM) and are principal contributors to premature death. These metabolic disorders are significantly increasing among adults in the Middle East. Data collected from adults aged ≥ 15 from 16 countries, including Saudi Arabia, has revealed a 74-86% prevalence of obesity among men and 69-77% among women [8, 9].

The prevalence of obesity among the elderly has dramatically increased in the last years [10], as aging is normally associated with a progressive rise in fat mass, which peaks nearly at 65 years in men and later in women [11]. Increasing body mass index (BMI) along with aging is mainly due to a decrease in the basal metabolic rate, increase in body fat and the limitation of movement ability [12].

In Saudi Arabia, the population is going through a transition phase where regular and traditional food is replaced with fast food, which is rich in fat, sugar and salt [13]. With age, total body fat increases and due to the higher MI or waist circumference, the presence of malnutrition could be masked [14]. This study mainly aims to estimate the prevalence of obesity among the elderly population in Saudi Arabia and its association with various chronic diseases.

METHODOLOGY:

This was a cross-sectional study conducted in Saudi Arabia during the period from 1 June 2020 to 30 September 2020.

Study area and setting

The study will be carried out at primary health care centers belonging to the Ministry of Health (MOH), Al-Taif city, KSA.

Study population

All individuals attending primary healthcare throughout the period of the study were eligible for inclusion in the study, provided they fulfill the selection criteria.

Inclusion criteria

- Age older than 55 years
- Both genders
- Able to read and write independently
- Saudi

Exclusion criteria

- Illiterate
- Not willing to participate in the study

Sample size: We distributed the questionnaire among the targeted population during the study period, and

all complete forms of eligible subjects were included, reaching a total of 259 participants.

Data collection tool

For data collection, a self-administered questionnaire was used. It was composed of two sections. Section 1 contains the participants' socio-demographic characteristics (age, gender, marital status, level of education, occupation, residency, and history of chronic diseases). The second section asks about the personal history of chronic diseases, as stated by participants, where the data collector discusses the questions.

Data collection technique

In the chosen primary healthcare centers, the researcher distributed the questionnaire to each participant and explained to them the essence of the study and confidentiality of the information provided to them. Consent was taken orally and in writing from each participant.

Statistical analysis

Data was entered and processed using the Statistical Package for Social Sciences (version 26). Descriptive analysis was performed to calculate frequencies and percentages. We used the Chi-square test for association analyses. To determine the prevalence of obesity among each chronic disease group, we presented obesity trends as a percentage of each corresponding category (frequency) from the original group.

Ethical consideration

The questionnaire included a short introduction to interpret the main objects of the study to the participants. Participants were informed that participation was completely voluntary. No names were recorded on the questionnaires. All questionnaires were kept private.

RESULTS:

Table (1) shows the socio-demographic characteristics of the participants. Out of 259

respondents, 57.1% were females with a mean age of 67.1 ± 9.5 . Approximately 45.6% of them were obese, 25.1% were overweight, and only 2.7% were underweight. Most of the participants (64.9%) were married, and 44.4% of them were illiterate, while only 18.5% had a university degree. A total of 68% of the participants were non-smokers, and 10% were smokers.

Table (2) presents the associations between chronic diseases among the elderly population and obesity. There has been a significant association between cardiovascular diseases among the elderly population ($P=0.043$), as 43.2% of them had hypertension, and 46.4% of the participants with hypertension were obese. 11.6% of them had thrombosis, and 60% of the participants were thrombosis were obese. All of the respondents who had valvular heart disease (0.8%) were obese. Over half of the participants (57.1%) who had arrhythmia (8.1%) were also obese. Thyroid diseases were also significantly associated with obesity ($P=0.001$), as 13.5% of the participants had hypothyroidism, and of the participants with hypothyroidism, 62.9% were obese. 5.8% of them had hyperthyroidism, and 80% of the participants who had hyperthyroidism were obese. While most of the population (80.7%) did not suffer from any thyroid diseases, and 40.2% of them were obese. There was a significant association between chronic ear diseases and obesity ($P=0.026$); over half of them (54.4%) did not suffer from any chronic ear diseases, and 53.2% of them were obese. 31.3% of the participants had hearing impairment, and 40.7% of them were obese. 10.8% of the participants had otitis media, and 28.6% of them were obese. Only 3.5% of the participants had an inner ear infection, and 22.2% were obese. Respiratory diseases were also significantly associated with obesity ($P=0.013$). Nearly three-quarters of the participants (77.6%) did not have any respiratory diseases, and (41.3%) of them were obese. 19.7% of the participants had bronchial asthma, and 64.7% were obese.

Table (1): Description of Socio-demographic characteristics of the participants (N=259)

Parameter	Frequency	Percent
Gender		
• Female	148	57.1%
• Male	111	42.9%
Age		
• From 55 - 68 Years old	144	55.6%
• From 69 - 83 Years old	102	39.4%
• From 84 - 99 Years old	13	5.0%
Mean±SD	67.1±9.5	
BMI		
• Underweight	7	2.7%
• Normal	69	26.6%
• Overweight	65	25.1%
• Obese	118	45.6%
Marital status		
• Widowed	80	30.9%
• Single	4	1.5%
• Married	168	64.9%
• Divorced	7	2.7%
Educational level		
• Illiterate	115	44.4%
• Primary	47	18.1%
• Intermediate	16	6.2%
• Secondary	33	12.7%
• University	48	18.5%
Smoking status		
• Non-smoker	176	68.0%
• Smoker	26	10.0%
• Previous smoker	57	22.0%

Table (2) shows the associations between chronic diseases among the malnourished population and obesity (N=259).

Cardiovascular diseases	• Hypertension	112	43.2%	46.4%	0.043
	• Thrombosis	30	11.6%	60.0%	
	• Valvular heart disease	2	0.8%	100.0%	
	• Arrhythmia	21	8.1%	57.1%	
	• Coronary insufficiency	25	9.7%	24.0%	
	• None	69	26.6%	40.6%	
Neurological diseases	• Hemiplegia and thrombosis	7	2.7%	28.6%	0.082
	• Dementia	2	0.8%	50.0%	
	• Alzheimer	10	3.9%	50.0%	

	• Shaking hands	2	0.8%	0.0%	
	• Parkinsonism	8	3.1%	0.0%	
	• None	230	88.8%	47.8%	
Musculoskeletal diseases	• Arthritis	77	29.7%	50.6%	0.058
	• Rheumatism	51	19.7%	35.3%	
	• None	71	27.4%	38.0%	
	• Osteoarthritis	2	0.8%	100.0%	
	• Osteoporosis	58	22.4%	55.2%	
Diabetes mellitus	• Yes	93	35.9%	50.5%	0.229
	• No	166	64.1%	42.8%	
Thyroid diseases	• Hyperthyroidism	15	5.8%	80.0%	0.001
	• None	209	80.7%	40.2%	
	• Hypothyroidism	35	13.5%	62.9%	
Ear diseases	• Otitis Media	28	10.8%	28.6%	0.026
	• Inner ear infection	9	3.5%	22.2%	
	• Hearing impairment	81	31.3%	40.7%	
	• None	141	54.4%	53.2%	
Respiratory diseases	• Chronic sinusitis	2	0.8%	0.0%	0.013
	• Chronic bronchitis	5	1.9%	40.0%	
	• Bronchial Asthma	51	19.7%	64.7%	
	• None	201	77.6%	41.3%	
Psychological disorders	• Depression	21	8.1%	52.4%	0.766
	• Compulsive obsession	10	3.9%	40.0%	
	• None	228	88.0%	45.2%	

DISCUSSION:

Elderly populations are persisting in significantly expanding around the world. As obesity is a critical public health problem in the world, causing serious complications and affecting the individuals' quality of life, especially in the industrialized and developing countries. This study was conducted among the elderly population in Saudi Arabia and reported a 45.6% prevalence of obesity, and 25.1% were overweight.

Contrariwise, Alzahrani et al. [14] conducted a cross-sectional study in Saudi Arabia among 152 geriatric individuals to assess the prevalence of malnutrition and associated factors and reported a high prevalence of obesity (83.3%). Al-Modeer et al. [15] conducted a retrospective descriptive study among 880 elderly participants in the southern region of Saudi Arabia and reported a very low prevalence of obesity (5.6%). This conflicting pattern of prevalence of obesity in Saudi Arabia probably indicates how body image is characterized in the Saudi Society and may reflect that overweight and obesity are regarded as a mark of affluence [16].

The present study demonstrated a significant association between cardiovascular diseases among the elderly population and obesity ($P=0.043$). 43.2% of them had hypertension, and 46.4% of the participants with hypertension were obese. 11.6% of them had thrombosis, and 60% of the participants who had Valvular heart disease (0.8%) were obese. Abolfotouh et al. [17] conducted a similar study among 810 elderly individuals in South-western Saudi Arabia and reported a 32.4% prevalence of obesity, as well as a significant association between obesity and hypertension.

It is also reported that central obesity is related to a special hemodynamic pattern characterized by elevated total peripheral resistance, low cardiac output, besides a vasoconstriction response to psychological stress, which causes cardiovascular health problems and hypertension [18]. Zapatero et al. [19] demonstrated that obesity is has a strong relationship with a significantly lower risk of death in hospitalized patients with heart failure. Whereas

malnutrition in these patients duplicates the risk of death within hospitalization.

Our study found that thyroid diseases among elderly participants were significantly associated with obesity ($P=0.001$), 13.5% of the participants had hypothyroidism, and of 62.9% the participants with hypothyroidism were obese. Alrowaili *et al.* [20] conducted a cross-sectional study in Arar, Saudi Arabia, and that the prevalence of obesity in their population was (39.2%) and there was a significant association between obesity and hypothyroidism ($P=0.001$), which was consistent with our findings. Tahara *et al.* [21] reported a case of a 68-year-old-male with no former thyroid disease, then developed transient primary hypothyroidism that was related to protein-calorie malnutrition (PCM).

As the thyroid hormones are responsible for regulating various metabolic pathways, patients with thyroid dysfunctions are usually exposed to alterations in body weight, thermogenesis, and lipolysis in adipose tissue. Hypothyroidism is commonly related to a modest weight gain, reduced thermogenesis and metabolic rate, while hyperthyroidism is associated with weight loss despite the increased appetite and high metabolic rate [22].

We also found a significant association between chronic ear diseases ($P=0.026$) and respiratory diseases ($P=0.013$) among the elderly population and obesity. The findings of Al-Shawi *et al.* [23] did not agree with our results. After they investigated the effects of obesity on Eustachian tube function, they found no between obese and non-obese individuals regarding the function of the Eustachian tube. Guerra *et al.* [24] reported that obesity or overweight are commonly observed with chronic bronchitis rather than emphysema, though this distinction is not a regular role [25]. The potential reasons for the nutritional disorders among this group of patients may be due to decreased respiratory muscle mass and muscle strength, reduced ventilatory response to hypoxia, poor wound healing, and declined cell-mediated immunity [26].

CONCLUSION:

This study reported a relatively high prevalence of obesity among the elderly population in Saudi Arabia. We found a significant association between obesity and the elderly participants with cardiovascular diseases, thyroid diseases, chronic ear infections and respiratory diseases. The lack of data and literature that investigates these associations

between specific chronic and obesity restricted our understanding of the reasons for these associations.

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