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Original article

Obesity and Headache in Libyan Adults: Findings from a Descriptive Cross-Sectional Study in Gharyan City

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Abstract
Obesity and headache are conditions associated with a substantial personal and societal impact. This study aims to evaluate the association between body mass index (BMI) and Headache among adults in Gharyan City, Libya. This was a descriptive cross-sectional study, conducted at Gharyan city, Libya, during the period from December 2024 to March 2025. Two hundred (200) participants, including 94 males (47%) and 106 females (53%), were enrolled in this study. Data were collected by using a structured questionnaire. The participants were divided into four categories, based on BMI: underweight (<18.5), normal weight (18.5 to 24.9), overweight (25 to 29.9), and obese (>30). A total of 200 participants, both gender males and females, were enrolled in this study during the study period. The study indicates that high percentage of headache in age was 43 -56 years, and severe obesity BMI > 30 kg/m2 were observed of high percentage in females n=27 (25.47%) compared to males n=17 (18.08%), although the severe obesity and headache found in females n=37 (34.90%), rather than males n=30 (31.91%) Obesity and headache are both, slightly more common in females than males, we recommend that more studies among obesity and headache in large patients should be done, although small sample size and lack of long-term flow-up of patients, were the main limitations of our study and results suggested a need for monitoring by X-ray and MRI diagnosis of patients have obesity
Keywords. *Obesity. Headache, Gharyan City, Libya.*

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Introduction

Obesity is a global health issue, affecting over half a billion individuals, and is defined by the World Health Organization as having a body mass index (BMI) > 30 kg/m2. The prevalence of overweight and obesity has increased substantially in recent decades, and obesity is one of the main risk factors for diseases of various kinds and death worldwide [1,2]. Recent literature has consistently demonstrated an association between obesity and headache [3]. Body mass index (BMI) is calculated as weight in kilograms (kg) divided by the square of height in meters (m2) and is universally applied in the quantification of the degree of obesity. In adults, BMI is commonly presented as a numerical value to indicate overweight/obesity (a BMI ≥ 25.0 kg/m2 and < 29.9 kg/m2 for overweight; a BMI ≥ 30 kg/m2 for obesity) [4]. Nutritional disorders are diseases that occur when a person's dietary intake does not contain the right amount of nutrients for healthy functioning, or when a person cannot correctly absorb nutrients from food. Nutrition disorders can be caused by undernutrition, overnutrition (leading to obesity), or an incorrect balance of nutrients [5].

Overweight and obesity are defined as abnormal or excessive fat accumulation that may lead to health impairment. The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended. Globally, there has been an increased intake of energy-dense foods that are high in sugars and fat, and an increase in physical inactivity because of the increasingly sedentary nature of many forms of work, changing modes of transportation, and increasing urbanization [6]. Obesity is associated with multiple medical co-morbid conditions such as hyperlipidemia, cardiovascular disease, and depression [7, 8]. Obesity causes significant personal distress to the patients as well as increases their financial burden. It is estimated that approximately 9.6% of migraine patients are obese [8]. Recent data have also supported an association between obesity and pain disorders, such as headache, particularly migraine [9]. It is now known that weight reduction interventions have been successful in reducing the frequency of migraine episodes in the treated population [10]. Overweight and obesity are linked to more deaths worldwide than underweight. However, the relation of headache to obesity was probably first identified by Scher and colleagues in 2003 [11].

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Headache, especially migraine-like headache, is a common neurovascular disorder worldwide and is considered the most disabling neurological disease that adversely affects the quality of life of individuals who suffer from it [12]. Migraine is one of the common primary headaches and among the top ten causes of disability globally [13]. It is currently accepted that the occurrence of headache is intimately related to multiple genetic, environmental, lifestyle, socioeconomic, and nutritional factors [14,15,16]. The primary clinical manifestations of headache can be simply generalized according to the International Classification of Headache Disorders (ICHD-3), the third edition [17]. Headache and obesity are prevalent and disabling disorders that are influenced by a variety of physiological, psychological, and behavioral mechanisms, many of which are affected by weight loss [17].

It is not unusual for migraine patients to be obese. Recently, attention has focused on the potential relation between overweight and frequency and severity of headache attacks [14, 15], and some evidence for this relationship has been demonstrated [16,17]. Recurrent attacks of unilaterally or bilaterally located throbbing pain are accompanied by a series of concomitant autonomic symptoms, including nausea, vomiting, and photophobia. The Objective of this study was to evaluate the association between body mass index (BMI) and Headache among adults in Gharyan City, Libya.

Methods

This was a descriptive cross-sectional study, conducted at Gharyan city, Western Libya, during the period from December 2024 to March 2025. Two hundred (200) participants were enrolled in this study. The participants included 94 males (47%) and 106 females (53%). Data were collected by using a structured questionnaire. The participants were divided into four categories, based on BMI: underweight (<18.5), normal weight (18.5 to 24.9), overweight (25 to 29.9), and obese (>30). All body measurements were taken using standard anthropometric protocols. Weight was recorded in kg using a calibrated digital scale. Height in meters was obtained from a fixed audiometer. BMI was calculated as weight divided by the square of height.

Statistical Analysis

Data were analyzed using Microsoft Office Excel and the statistical package of Social Science (SPSS) version 25. Descriptive statistics data were applied to describe all the categorical variables by a medical statistician, including frequency and percentage. The level of the p-value ≤ 0.05 was considered statistically significant.

Ethical consideration

Verbal informed consent was also taken from all participants before collecting the data, and the information was used anonymously.

Results

Table 1 shows the distribution of the participants according to BMI and Gender. A total of 31 individuals (30.8%) belong to the underweight category, and 61 individuals (52.45%) belong to the normal category. 63 individuals (63.2%) belong to obesity, and 44 individuals (43.6%) belong to severe obesity.

Table 1. Distribution of the participants according to BMI and Gender.

BMI	Cases	Male (no)	(%)	Female (no)	(%)
<18.5	Underweight	13	13.82	18	16.98
18.5-24.9	Normal	33	35.10	29	27.35
25-29.5	Obesity	31	32.97	32	30.18
>30	Severe obesity	17	18.08	27	25.47
Total		94	100%	106	100%

Table 2 shows the high number of participants according to their age between 43 – 56 years have a headache in both genders, followed by age more than 70 years in both genders are represent 37 (37.7%), then age 57-70 years in both genders are represent 31 (30.8%), then age 29 -42 years in both genders are represent 26 (25.96%) and age 14- 28 years in both genders are represent 20 (19.83%) respectively.

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Table 2. Distribution of headaches according to Age and Gender.

Age	Males (no)	Headache %	Female (no)	Headache %
14 - 28	8	8.51	12	11.32
29 - 42	12	12.76	14	13.20
43 - 56	18	19.14	20	18.86
57 -70	13	13.82	18	16.98
70>	17	18.85	20	18.86
Total	68	72.34%	84	79.24%

(Table 3); shows that Obesity cases of body mass index and headache among females were 20.75%, males 19.14%, followed by severe obesity among females, which were 34.90%, and males, 31.91%.

Table 3. Distribution of the cases with high BMI and headache among both genders (Male and Female).

Cases (BMI)	Male - Headache (No)	%	Female –Headache (No)	%
Obesity	18	19.14%	22	20.75%
Severe Obesity	30	31.91%	37	34.90%
Total	48	51.06%	59	55.66%

Discussion

This study aims to evaluate the association between body mass index (BMI) and Headache among adults at Gharyan city, Libya, during the period from December 2024 to March 2025. The current study involved 200 participants, 106 females (53%) and 94 males (47%) who were classified according to BMI (<18.5 kg/m2, 18.5 – 25 kg/m2, 25 -30 kg/m2, and > 30 kg/m2). In this study, severe obesity BMI >30 found in females 37 (34.90%) versus males 30 (31.91%). However, a normal BMI obesity (18.5 – 25kg/m2) was observed in males 33 (35.10%) versus females 29 (27.35%), respectively, which was Similar to findings obtained by (Ida Fortini et al) [18]. In this study, obesity with headache was noted to be more pronounced in females, which may suggest that these individuals are more predisposed to headache. These findings agree with results obtained by (Bu X-X, et ta) [19].

In addition, our study revealed that the distribution of a Headache according to Age in both Gender, high percentage of headaches cases found of age between 43 -56 years in female n=20 (18.86%), and males n=18 (19.14%), followed by age > 70 years in females n=20 (18.86%) and males n=17 (18.34%), then in age between 57 – 70 years in females n=18 (16.98%), and males n=13 (13.82%). Then, in the age range 29 – 42 years in females n=14 (13.20%), and males n=12 (12.76%), lastly, in the age range 14 – 18 years in females n=12 (11.32%), and males n=8 (8.51%) respectively. Similarly, Peterlin's analysis [20] evaluated the prevalence of severe headaches in those with and without general obesity and the effect of age on both genders. They found that in females and males aged 20-55 years, headache was associated with obesity.

This was the first study which suggested and obviously demonstrated that older participants or those of post-reproductive age who have headache do not have an association with obesity, while those of reproductive age do, which also suggested that both headache and obesity are modulated by reproductive status [21] The finding that headache and obesity is associated with those of reproductive age by Peterlin et al. This association was also later supported by data from (Vo et al, and Robberstad et al) [21-23].

Conclusion

Both Obesity and headache are slightly common in females than in males. We recommend that more studies on obesity and headache in large patient populations should be done, although small sample size and lack of long-term follow-up of patients were the main limitations of our study, and results suggested a need for monitoring by X-ray and MRI diagnosis of obese patients who have a headache.

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Conflicts of Interest

The authors declare no conflicts of interest.

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References

1. Steiner TJ, Stovner LJ, Vos T, Jensen R, Katsarava Z. Migraine is first cause of disability in under 50s: will health politicians now take notice? J Headache Pain. 2018 Feb 21;19(1):17.
2. NCD Risk Factor Collaboration (NCD-RisC). Worldwide trends in body mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128.9 million children, adolescents, and adults. Lancet. 2017 Dec 16;390(10113):2627-2642.
3. Fakher MK, Hassan ZN. The Effect of Body Mass Index on Migraine Severity in Female Patients. *Thi-qar medical journal*. 202; *26*(2), 610-638.
4. Bu XX, Zhu LH, Wang ZM, Lu C, Chen H, Yu D. Association of obesity with headache among US children and adolescents: evidence from NHANES 1999–2004. Front Endocrinol (Lausanne). 2023; 13:(1072419):1-10.
5. Fakher MK. The effect of body mass index on migraine severity in female patients. Tikrit Qual Med J. 2023;26(2):610-639.
6. World Health Organization. Obesity and overweight [Internet]. Geneva: WHO; 2021 [cited 2021 Feb 1]. Available from: https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight
7. Bruce SG, Riediger ND, Zacharias JM, Young TK. Obesity and obesity-related comorbidities in a Canadian First Nation population. Chronic Dis Inj Can. 2010 Dec;31(1):27-32.
8. Bhoi SK, Kalita J, Misra UK. Metabolic syndrome and insulin resistance in migraine. J Headache Pain. 2012 Jun;13(4):321-326.
9. Evans RW, Williams MA, Rapoport AM, Peterlin BL. The association of obesity with episodic and chronic migraine. Headache. 2012 Apr;52(4):663-671.
10. Novack V, Fuchs L, Lantsberg L, Kama S, Lahoud U, Horev A, et al. Changes in headache frequency in premenopausal obese women with migraine after bariatric surgery: a case series. Cephalalgia. 2011 Oct;31(13):1336-1342.
11. Scher AI, Stewart WF, Ricci JA, Lipton RB. Factors associated with the onset and remission of chronic daily headache in a population-based study. Pain. 2003;106(1-2):81-89.
12. Vos T, Flaxman AD, Naghavi M, Lozano R, Michaud C, Ezzati M, et al. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet. 2012 Dec 15;380(9859):2163-2196.
13. Elser H, Morello-Frosch R, Jacobson A, Pressman A, Reimer R, et al. Air pollution, methane super-emitters, and oil and gas wells in northern California: the relationship with migraine headache prevalence and exacerbation. Environ Health. 2021; 20:45.
14. Aamodt AH, Stovner LJ, Hagen K, Bråthen G, Zwart JA. Headache prevalence related to smoking and alcohol use: the Head-HUNT study. Eur J Neurol. 2006; 13:1233-1238.
15. Molarius A, Tegelberg A, Ohrvik J. Socio-economic factors, lifestyle, and headache disorders – a population-based study in Sweden. Headache. 2008; 48:1426-1437.
16. Headache Classification Committee of the International Headache Society (IHS). The international classification of headache disorders, 3rd edition (beta version). Cephalalgia. 2013; 33:629-808.
17. Fortini I, Dror B, Junior F. Headache and obesity. Arq Neuropsiquiatr. 2022;80(5 Suppl 1):204-213.
18. Faruqi SJ, Shahbaz NN, Yahya M, Butt MA, Memon FH, Ali SG, Sana R. Prevalence of obesity in patients suffering from migraine. Int J Res Med Sci. 2019 Dec;7(12):4748-4752.
19. Peterlin BL, Rosso AL, Rapoport AM, Scher AI. Obesity and migraine: the effect of age, gender and adipose tissue distribution. Headache. 2010 Jan;50(1):52-62.
20. Vo M, Ainalem A, Qiu C, Peterlin BL, Aurora SK, Williams MA. Body mass index and adult weight gain among reproductive age women with migraine. Headache. 2011 Apr;51(4):559-569.
21. Robberstad L, Dyb G, Hagen K, Stovner LJ, Holmen TL, Zwart JA. An unfavorable lifestyle and recurrent headaches among adolescents: the HUNT study. Neurology. 2010 Aug 24;75(8):712-717.