Original Article

Healthy Lifestyle Behaviors and Sleep Quality in Normal-Weight and Overweight/Obese Women: A Descriptive-Comparative Design

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Abstract

Background: The prevalence of obesity is increasing among women worldwide. Health-related issues for women of reproductive age influence their long-term health.

Aim: To compare healthy lifestyle behaviors and sleep quality between normal-weight and overweight/obese women.

Methods: A descriptive-comparative design was conducted. The target population consisted of women who applied to nine family health centers in a city center in Turkey. The sample consisted of 670 women. Personal Information Form, Healthy Lifestyle Behaviors Scale II, and Pittsburgh Sleep Quality Index were used to collect data.

Results: The sleep quality of overweight/obese women was found to be worse than normal-weight women. The healthy life behavior mean scores of overweight/obese women were lower than those of normal-weight women (p <0.05). Physical activity and stress management mean scores of overweight/obese women were significantly lower than those of normal-weight women, however, there was no difference in nutrition mean scores.

Conclusions: The present study concluded that normal-weight women displayed healthier lifestyle behaviors than overweight/obese women and had good sleep quality. Nurses could encourage overweight and obese women to improve healthy lifestyle behaviors such as increasing physical movement, adequate sleep, and stress management.

Key Words: body mass index, healthy lifestyle, obesity, overweight, sleep quality, women, nursing

Introduction

Obesity has become one of the most important public health problems worldwide. The World Health Organization reported that 39% of men and 40% of women age 18 years and over were overweight; and 11% of adult males and 15% of adult females were obese in 2016. The prevalence of obesity is increasing among women worldwide. Women are more likely to be overweight and obese due to excessive consumption of carbohydrates, trans fats and sugar, and low physical activity. Research evidence also shows that 25% of overweight women will become obese (Youngwanichsetha 2018).This rapid increase in obesity is due to lifestyle factors such as physical inactivity, unhealthy diet options, and eating patterns (McHill & Wright 2017). Evidence shows that even a ≥5% weight loss reduces the risk of non-communicable diseases such as cardiovascular disease, elevated systolic and diastolic blood pressure, abnormal high-density lipoprotein (HDL), high cholesterol, and cancer (Chang et al., 2019).

Health promotion behaviors are considered to be important factors in preventing non-communicable diseases, protecting well-being, and improving health (Ashgar & Krishnasamy, 2023; Mirghafourvand et al. 2014; Shaahmadi et al., 2019).Health promoting behaviors are categorized into six different dimensions: physical activity, nutrition, stress management, health responsibility, interpersonal relationships, and spiritual development (Pender, Murdaugh, and Parsons 2015). Due to the specificity of certain health-related issues for women of reproductive age, as well as the fact that the health of women of reproductive age influences their long-term health and that of their family members particularly their children, it is essential to promote healthy lifestyles in women (Mirghafourvand et al., 2014).

Sleep is a basic requirement for life and is a potentially modifiable behavioral risk factor for metabolic health (Ding et al., 2018). Sleep disorders affect neuro-hormones, leading to increased calorie intake, which can reduce physical activity. Chronic sleep deprivation also causes fatigue and decreased physical activity in individuals. Therefore, sleep duration and quality are associated with obesity (Darroudi et al., 2021; Salarinia et al., 2017). Evidence suggests that sleep disorders (e.g. insufficient sleep time, poor sleep quality, and insomnia) can contribute to obesity and type 2 diabetes mellitus (Darroudi et al., 2021; McHill & Wright 2017). Poor sleep quality was also independently associated with increased body mass index (BMI) and worse glycemic control (Lee, Ng, & Chin 2017; Yilmaz et al., 2021). Excessive weight causes sleep problems and sleep disturbances promote weight gain. There is an association between obesity and obstructive sleep apnea which is the most common sleep disorder (Garbarino et al., 2016).

Women, who constitute about half the population of a society, are the primary home care providers in most families. Therefore, practicing healthy living behaviors will affect not only their health, but also the health of their families and society (Enjab et al., 2014). In the literature, there are studies investigating healthy lifestyle behaviors (Enjab et al., 2018; Shaahmadi et al., 2019; Woynarowska-Sołdan 2018) and sleep quality (Li et al., 2021; Park et al., 2018; Salarina et al., 2017) in overweight and obese women. Moreover, being overweight/obese, and poor sleep quality were found predictors of health-promoting behaviors among menopausal women (Abdelaziz et al., 2022).However, a gap exists in the literature regarding whether there is a relationship between the healthy lifestyle behaviors and sleep quality in overweight and obese women compared to normal-weight women. Implementing healthy lifestyle behaviors of women and improving sleep quality can contribute to achieving weight control, thereby improving both family and community health. It is anticipated that the study results would contribute to designing intervention plans to create motivation toward a healthy lifestyle and improve sleep quality.

This study was conducted to compare healthy lifestyle behaviors and sleep quality between normal-weight and overweight/obese women. The research hypothesis was that there may be a difference between overweight / obese and normal-weight women regarding healthy lifestyle behaviors and sleep quality.

Methods

Study design and participants: A descriptive-comparative design was performed to examine differences in sleep quality and health promotion behaviors in two groups that occur naturally in a setting. The target population was composed of women who applied to nine family health centers in a Turkish city center (N = 704). All women were invited to participate in the study. Of these women, 34 were excluded from the study because their body mass index was <18.50. The final sample consisted of 670 women. Women were divided into two groups as normal-weight (n = 356) and overweight / obese (n= 314) according to their body mass index values.

Inclusion criteria were: 1) over 18 years old, 2) BMI ≥18.5, 3) at least 2 years have passed since the last pregnancy, and 4) agree to participate in the study. Exclusion criteria were: 1) visual-hearing impairment, 2) pregnancy, 3) physical or mental illness, and 4) BMI <18.50.

Data collection tools: For data collection, personal information form, Healthy Lifestyle Behaviors Scale II and Pittsburgh Sleep Quality Index were used. The personal information form based on literature(Kim et al. 2017; Mirghafourvand et al., 2015; Salarinia, et al., 2015) consisted of 12 closed-ended sociodemographic questions of women such as age, education level, marital status, employment status, income level, presence of chronic disease, drug use, smoking and alcohol use, and height and weight measurements.

The Healthy Lifestyle Behaviors Scale was first developed in 1987.The scale was revised in 1996 and named the Healthy Lifestyle Behaviors Scale II (Walker & Hill-Polerecky 1996).The validity and reliability of the scale in Turkey was performed by Bahar et al., (2008) and Cronbach's alpha value was found .92. The scale consists of 52 items and has six subgroups. Sub-groups of the scale are health responsibility, physical activity, nutrition, spiritual development, interpersonal relationships, and stress management. Items in the scale are scored as (1) never, (2) sometimes, (3) frequently, and (4) regularly. A minimum score of 52 and a maximum of 208 points can be obtained from the scale. Higher scores indicate greater participation in Healthy Lifestyle Behaviors (HPBs) (Bahar et al., 2008).Cronbach alpha coefficient was 0.94 in this study.

Pittsburgh Sleep Quality Index (PUKI) was developed by Buysse et al.(1989) to evaluate sleep quality in psychiatric practices and clinical research. The Turkish validity and reliability were conducted by Agarun, Kara & Anlar (1996). The Cronbach alpha reliability coefficient was found to be .80. Pittsburgh Sleep Quality Index evaluates sleep quality in the past month. In the index, 19 of the 24 questions are self-report questions. Five questions answered by the spouse or a roommate are used for clinical information only and are not included in scoring. The scale has seven sub-scales evaluating subjective sleep quality, sleep latency, sleep duration, habitual sleep efficacy, sleep disorders, use of sleeping pills, and loss of daytime functionality. The sum of the seven component points gives the total PUKI score. The scale total score ranges from 0 to 21. A high total score indicates poor sleep quality. The total PSQI score greater than five indicates that the sleep quality of the individual is insufficient with 89.6% sensitivity and 86.5% specificity, and indicates that there is serious deterioration in at least two areas or moderate deterioration in at least three areas mentioned above (Agarun, Kara & Anlar,1996).

Body Mass Index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults. It is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m^2). A BMI between 25.0-29.9 is overweight, a BMI greater than or equal to 30 is obesity, and a BMI between 18.5-24.9 is normal-weight (World Health Organization, 2019).

Data collection: Data was collected face-to-face in each family health centers. Women were evaluated in terms of inclusion and exclusion criteria by the researcher. Women who met the inclusion criteria were given information about the process of the research. Weight and height measurements of women who agreed to participate in the study were performed by one of the researchers. Tape measure on the wall was used for measuring the height of women. Participants stood flat without shoes, with their back, shoulders, and back of the head touching the wall. With the help of a ruler, the measurement value was determined by marking the wall over the head. Women were weighed with underwear, a single layer of clothing, and without shoes. The digital scale had a sensitivity of 0.01 kilograms. After the weight and height measurements of the participants were obtained, their BMI was calculated. Then, instruments were given women to complete the instruments under the observation of the researchers.

Data analysis: Data analysis was performed using IBM SPSS (Statistical Package for the Social Sciences, Chicago, Illinois)25.0 for Windows. Descriptive variables were presented as frequencies, percentages, mean, and standard deviation. The normality distribution of the data was evaluated skewness and kurtosis values ±2. Chi-square test was used to compare categorical data. Independent sample t-test was used in two

groups which had continuous variables. The results of the analysis were evaluated within the 95% confidence interval and a two-sided p value < 0.05 was considered significant for all analyses.

Ethical Procedures: The study protocol was approved by the ethics committee of Zonguldak Bulent Ecevit University (31.01.2018 / 298). In order to conduct the study at family health centers, a written approval was obtained from Zonguldak Provincial Directorate of Health. Verbal consent was taken from the men who approved to participate in the study. All women were informed about the study and their verbal and written informed consents in which they have been assured that their identities and responses will be anonymous and that participants' data will be kept confidential as possible were obtained.

Results

The sociodemographic characteristics of the women were shown in Table 1. There was a significant difference between normal-weight and overweight/obese women regarding characteristics such as age, marital status, education level, working status, income level, presence of chronic disease, regular medication use, and family history of obesity.

The total mean score of the Healthy Lifestyle Behavior Scale was found to be 129.83 (*SD*= 23.82) in the overweight/obese women, 133.48 (*SD*= 23.32) in women with normal-weight, and the difference between the groups was statistically significant (*p*<0.05). The mean of physical activity subscale score was 16.58 (*SD*= 5.42) in overweight/obese women, 15.02 (SD= 5.44) in normal-weight women, and the difference between the groups was statistically significant. (*p*<0.05). Stress management mean scores were found to be 21.06 (*SD*= 4.47) and 20.31 (*SD*= 4.46) in overweight / obese and normal-weight women, respectively (*p*<0.05). The mean sleep quality scores were found to be 5.26 (*SD*= 2.93) and 6.16 (*SD*= 2.85) in overweight / obese and normal-weight women, respectively. (*p*<0.05). There was no significant difference between overweight / obese and normal-weight women regarding health responsibility, nutrition, interpersonal relations, and spiritual development mean scores (*p*>0.05) (Table 2).

Table 1: Comparison of descriptive characteristics of normal weight and overweight/obese women

Descriptive characteristics	Normal weight (n = 356) n (%)	Overweight/Obese (n = 314) n (%)	Statistical analysis
Age groups			
18-24 years	91 (25.6)	25 (8.0)	χ2= 63.016
25-45 years	207 (58.1)	166 (52.8)	**p < 0.001**
45 years and over	58 (16.3)	123 (39.2)	
Marital status			
Married	178 (50.0)	244 (77.7)	χ2= 54.938
Single	178 (50.0)	70 (22.3)	**p < 0.001**
Education level			
Primary school degree	58 (16.3)	123 (39.2)	χ2= 57.424
Secondary/high school degree	119 (33.4)	109 (34.7)	**p < 0.001**
Baccalaureate or graduate degree	179 (50.3)	82 (26.1)	
Working status			
Working	143 (40.2)	100 (31.8)	χ2= 4.998
Not working	213 (59.8)	214 (68.2)	**p = 0.025**
Income level			
Less than expense	93 (26.2)	80 (25.5)	χ2= 0.886
Equal to expense	187 (52.5)	175 (55.7)	p = 0.642

More than expense	76 (21.3)	59 (18.8)	
Having any chronic disease			
Yes	63 (17.7)	120 (38.2)	χ2= 35.386
No	293 (82.3)	194 (61.8)	**p < 0.001**
Regular medication use			
Yes	114 (32.0)	167 (53.2)	χ2= 30.685
No	242 (68.0)	147 (46.8)	**p < 0.001**
Smoking			
Yes	154 (43.3)	139 (44.3)	χ2= 0.069
No	202 (56.7)	175 (55.7)	p = 0.793
Drinking alcohol			
Yes	48 (13.5)	29 (9.2)	χ2= 2.959
No	308 (86.5)	285 (90.8)	p = 0.085
Family history of obesity			
Yes	58 (16.3)	117 (37.3)	χ2= 38.016
No	298 (83.7)	197 (62.7)	**p < 0.001**

χ2= Chi-square test

Table 2: Comparison of healthy lifestyle behaviors and sleep quality of healthy and overweight/obese women

	Normal weight (n = 356) Mean (SD)	**Overweight/obese (n = 314) Mean (SD)**	**Statistical analysis**
Healthy Lifestyle Behaviors			
Health responsibility	21.24 (5.14)	21.10 (5.10)	t= 0.361 p= 0.718
Physical activity	16.58 (5.42)	15.02 (5.44)	t= 2.004 **p < 0.001**
Nutrition	21.98 (4.52)	22.13 (4.90)	t= 0.405 p= 0.685
Spiritual development	26.70 (5.24)	25.90 (5.35)	t= 1.957 p= 0.051
Interpersonal relations	25.92 (4.93)	25.38 (4.99)	t= 1.429 p= 0.154
Stress management	21.06 (4.47)	20.31 (4.46)	t= 2.153 **p= 0.032**
HLBs	133.48 (23.32)	129.83 (23.82)	t= 2.004 **p= 0.035**
Sleep quality	5.26 (2.93)	6.16 (2.85)	t= 4.002 **p < 0.001**

t= Independent t-test

Discussion

The current study sought to compare sleep quality and health promotion behaviors of women according to body mass index. Health promotion behaviors in the present study were at a moderate level, however, sleep quality was poor in overweight/obese women. Obesity affects quality of life, and also leads to imbalances in lifestyle and dietary habits, which have increasingly negative social consequences over time (Nho, 2017).

A variety of factors contribute to overweight and obesity, including metabolic and genetic abnormalities; however, in the overwhelming majority of cases they appear to be primarily linked to an unhealthy lifestyle

(Woynarowska-Sołdan et al., 2018). This current study found that the mean scores of healthy lifestyle behaviors of overweight/obese women were significantly lower than those of normal-weight women. Similarly, Enjezab et al., (2012) found that the majority of women were in the moderate level for health pattern behaviors and the lowest score was in physical activity. Woynarowska-Sołdan et al., (2018) found that positive health behaviors were more common in nurses whose BMI was normal than in nurses with BMI ≥ 25.0. Overweight and obesity increases the risk of cardiovascular diseases, diabetes, musculoskeletal diseases, cancer, and premature aging (Kim et al., 2017; Woynarowska-Sołdan et al., 2018; Youngwanichsetha, 2018). For this reason, it is important for the women to be healthy and apply health promotion behaviors to fulfill their maternal and social duties. Especially in overweight and obese women, it is necessary to encourage healthy lifestyle behaviors such as increasing physical movement, healthy nutrition, adequate and quality sleep, and stress management.

Health behaviors such as physical activity and healthy nutrition play a vital role in preventing different diseases and mortality (Ranjbar et al., 2015). Also, physical activity and diet are lifestyle behaviors that can be altered in maintaining and balancing energy balance for the treatment and prevention of obesity. Healthy eating behaviors such as consuming whole grain products, low-fat foods, and vegetable proteins help prevent excessive energy intake whereas increases in physical activity increase energy expenditure (Kim et al., 2017). In the current study, the mean of physical activity scores of overweight/obese women were lower than that of normal-weight women, but there was no difference in nutrition mean scores. This finding shows that physical activity is insufficient in overweight/obese women. Similarly, Shaahmadi et al., (2019) found that female physical activity scores were low and inactivity in these women causing excess weight and obesity. Physical activity and healthy dietary behaviors are two well-documented lifestyle factors influencing BMI (Kim et al., 2017). Therefore, it is thought that

increasing physical activity in women could be beneficial in weight control.

Health behaviors of an individual, such as stress management, are considered one of the important aspects of mental health (Ashgar & Krishnasamy, 2023; Enjezab et al., 2012). Chronic stress can be a risk factor that triggers, exacerbates, or causes weight gain (Kotwani & Mehta, 2019). In the present study, the mean stress management scores of overweight/obese women were significantly lower than normal-weight women. This finding indicates that overweight/obese women cannot cope with stress situations sufficiently. Similarly, Mouchacca, Abbott and Ball (2013) found that higher stress in women was associated with increased odds of having a higher BMI, and of being obese. Kotwani and Mehta (2019) demonstrated that a stress management intervention can contribute to greater weight loss in overweight and obese women. Cotter and Kelly (2018) found that perceived stressful experiences were associated with a higher BMI and waist circumference in a large sample of adult men and women. In the study of Mirghafourvand et al. (2014), a statistically significant relationship was found between stress management and BMI, and the lowest scores in stress management were achieved by obese women. Stress-induced chronic cortisol hypersecretion increases fat storage in the abdomen (Donoho et al., 2011, Speaker & Fleshner, 2012). Abdominal fat accumulation is associated with the development of cardiovascular disease, including coronary heart disease and ischemic stroke (Xenaki et al., 2018). Therefore, it is thought that stress management in overweight and obese women can play an important role in weight control.

Recently, interest in the role of sleep has increased in obesity and weight control, especially among women (Yilmaz et al., 2021).Body mass index was an independent determinant of nocturnal sleep duration; obesity and overweight may have negative consequences on sleep duration (Darroudi et al., 2021). In this study, the sleep quality of overweight/obese women was found to be worse than normal-weight women. Previous studies have demonstrated a relationship between poor sleep quality and obesity(Li et

al., 2021; Park et al., 2018; Salarina et al., 2017). Similarly, Salarina et al., (2017) revealed that women of reproductive age with overweight and obesity have poor sleep quality. Li et al., (2021) found that the risk of central obesity increased significantly with poor sleep quality. Park et al., (2018) found that there is a significant relationship between poor sleep quality and obesity in women. Sleep plays an important role in maintaining health, and sleep deprivation negatively affects metabolic and endocrine function (Salarina et al., 2017; Wang & Boros, 2019). Sleep quality is important in improving health. Research in the past decade has documented that sleep disturbance has a strong impact on the risk of diseases such as cardiovascular disease, cancer, and depression incidence (Wang & Boros, 2019). Also, poor sleep quality can change the appetite regulation mechanism, possibly leading to poor food selection and an increase in calorie intake (Krističevič, 2018). Factors that affect sleep quality can be controlled to achieve weight loss in women.

Conclusion: The present study concluded that normal-weight women displayed healthier lifestyle behaviors than overweight/obese women, and had good sleep quality. Physical activity and stress management behaviors were performed more frequently by normal-weight women compared to overweight/obese women. There was no significant difference was found regarding health responsibility, nutrition, spiritual development, and interpersonal relations. Factors that cause sleep problems in women should be investigated and sleep hygiene education should be provided. Prospective studies could be designed examining the causal relationship between healthy lifestyle behaviors and sleep in overweight and obese women for the future. Nurses could design awareness programs that highlight adopting healthy lifestyles, such as weight loss, physical activity, good nutrition to improve general wellbeing and reduce sleep problems. Nurses could organize physical activity programs for women, and social environments to support women's participation in physical activity. Nurses could teach effective coping methods to

women to develop their coping ability with stressful situations.

Limitations: There are several limitations. The present study was carried out only on women referred to the family health centers of one city, so generalization of the results should be performed with caution. A cross-sectional study cannot suggest the evident incidental risk for any health outcome and determine the temporal sequence of a relationship. Familial, environmental, cultural, and social factors may impact health promotion behaviors and sleep quality of the women.

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