

Relationship Between Health-Promoting Lifestyle and Body Mass Index in Male Nurses Based on Demographic Variables

American Journal of Men's Health
 November-December 1–10
 © The Author(s) 2020
 Article reuse guidelines:
sagepub.com/journals-permissions
 DOI: 10.1177/1557988320966519
journals.sagepub.com/home/jmh


Nahid Hossein Abbasi¹  and Maryam Aghamiri¹

Abstract

Behaviors such as an appropriate diet, physical activities, health responsiveness such as attending diagnoses and treatment recommendations, preventing from known health risks such as smoking, allocating time to rest and peace and managing stress are related to health-promoting lifestyles (HPLs). The objective of the current study was to determine the relationship between HPL and body mass index (BMI) of male nurses based on demographic variables. A descriptive correlation survey was conducted among 108 male nurses using the nonprobability sampling technique. Data were gathered through a questionnaire consisting of two parts: demographic characteristics and Pender's health promotion questionnaire. Data were analyzed by presenting measures, mean, standard deviation, independent *t*-test, Pearson's coefficient correlation, and one-way analysis of variance (ANOVA), using SPSS version 22. The mean score for male nurses' HPL was good (3.13). The highest mean was from spiritual growth (3.48) and the lowest was from physical activity (2.69). Approximately 24.07% participants were overweight and obese. The mean of HPL in normal-weight people was better than that of obese ones. Participants did not pay much attention to their family's health-promoting behaviors. They also were exposed to occupational hazards, including psychological (47.2%), ergonomic (21.7%), physical (20.8%), and biological hazards (10.4%). There was no significant relationship between age ($p = .14$), educational level ($p = .95$), marital status ($p = .32$), job experiences ($p = .17$), and HPL variables. As health providers, nurses should both provoke patients to attain their health and to strive to maintain and sustain their own health, especially for obesity prevention. From society's perspective, a nurse is one who knows more and acts better; therefore, paying attention to nurses' HPL is a professional and social expectation.

Keywords

health-promoting lifestyle, body mass index

Received June 18, 2020; revised August 29, 2020; accepted September 18, 2020

Health is the most fundamental criterion on which man's life is dependent, and it has always been an issue throughout history. Health, according to a definition by the World Health Organization (WHO), is physical, spiritual, mental, social, emotional, and occupational tranquility, and not just the absence of illness. This definition, moreover, has been reintroduced as "people's social and economic potency and dynamicity" (WHO, 2017). In this regard, health promotion is a concept that deals with studying biological, mental, and social factors surrounding people; it depicts multidimensional and complicated factors necessary for people to reach proper health (Edington et al., 2015).

Lifestyle is one of the most important determinants of health promotion that is influenced by cultural, economic, political and religious factors. Lifestyle includes

day-to-day behaviors and functions of individuals in job, activities, fun, and diet (Farhud, 2015). Based on the findings, more than half of the quality of life depends on people's lifestyle and behaviors (Ghorbani et al., 2012; Heidari et al., 2017). Behaviors such as appropriate diets, physical activities, and health responsiveness such as paying attention to disease symptoms and treatment recommendations, preventing known health risks

¹Department of Nursing and Midwifery, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran

Corresponding Author:

Nahid Hossein Abbasi, Department of Nursing and Midwifery, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran.
 Email: nahid.habbasi@gmail.com



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (<https://us.sagepub.com/en-us/nam/open-access-at-sage/>).

such as smoking, allocating time to rest and peace, and managing stress are variables related to health-promoting lifestyles (HPLs; Edelman & Connelly, 2018; Sines et al., 2015). An HPL can reduce financial burden by reducing the cost of health care, treatment, and family planning services (Dworkin et al., 2015).

Although the concept of HPL in men has become a priority in all countries, studies report that men's health behaviors bear multidimensional shortcomings in the course of social changes (Baker, 2016; Bardehle et al., 2017). Evidence suggests that women are healthier than men in terms of health care and health outcomes, and this health-related gender inequality has attracted little national and international attention. This is due to factors such as occupational risks and male behavior paradigms such as lifestyle (Baker, 2016; Dworkin et al., 2015; Pelman & Elterman, 2014). A number of studies have explored that men's health is more subject to social issues such as job problems than women's health. In fact, the presence of more men in society threatens their healthy lifestyle, which threatens the health of society (Cheshire et al., 2016). Studies in Iran reveal that due to male behavior paradigms, the rate of disease, side effects, and injuries among men for all ages is reported to be higher than women. Men's health is an issue that leads to the strengthening and promotion of the health of society's workforce and will lead to the development of society (Hatami et al., 2016; 4th Congress on Men's Health, Iran, 2020).

Many health problems such as overweight, obesity, and cardiovascular diseases in most developed and developing countries are related to the evolution in the lifestyle of people in that society (Borroso et al., 2018; WHO, 2017). In addition, studies present a close relationship between overweight, obesity, and behaviors-promoting lifestyle in people (Hoare et al., 2019; Zaman, 2015). Due to lifestyle changes in Iran, obesity, its side effects, and consequences foreshadow a worrying situation concerning health. Neglecting to pay attention to the appropriate weight causes a wide range of health-related problems (Abdi et al., 2019; Fathabadi et al., 2019; Navidian et al., 2010).

Obesity and its development throughout the globe have been three times greater since 1976 (WHO, 2017). Based on reports from developed countries such as Australia, more than 75% of adult men suffer from overweight and obesity (A picture of overweight and obesity in Australia, Australian Institute of Health and Welfare, 2017). The prevalence of obesity in Iran is estimated to be 21.7% in adults and 6.1% in children (Rahmani et al., 2015).

The most extensive definition of obesity is body mass index (BMI), in which weight (kg) is divided by the squared height (m). Based on the definition by WHO, a BMI of 30 and above indicates obesity (WHO, 2017). Obesity leads to a wide range of chronic systemic

diseases and an increase in risk for surgery (Borroso et al., 2018; Kyrou et al., 2018). In line with this, studies identify that abdominal weight gain and obesity in men leads to a reduction of testosterone level and sperm numbers, erection disorders, and increased risk of kidney stones and prostate cancer (Zhang et al., 2018). Based on a comprehensive study throughout the world, 14% of early deaths are related to obesity issues (Global Burden of Diseases [GBD] obesity collaborators, 2017).

It is clear that not enjoying a healthy lifestyle and suffering from obesity will bring forth irreparable consequences in the future. As a key member of the health team, nurses, especially males, should actively participate in health planning and promote HPLs, for the prevention of obesity and its consequences (Braga et al., 2018; Kable et al., 2015). In addition to meeting the care needs of clients, nurses should pay attention to their health needs (Kelly, 2017; Salmond & Echevarria, 2018; Zapka et al., 2009).

However, it seems that nurses do not pay much attention to their HPLs due to professional concerns. Evidence shows that nurses always play a role in caring for patients, health-promoting efforts are not considered a priority by them across the world, and they are mainly obsessed with patients' health promotion. Nurses' health affects not only various aspects of their life but also the health promotion of patients, families, and societies (Braga et al., 2018; Maurer & Smith, 2013). As a result, since male nurses' lifestyles have changed, similar to other people, their BMIs too have changed (Kelly & Wills, 2018; Zapka et al., 2009). Obesity in nurses may be a challenge because of the barriers they face in leading a healthy lifestyle (Kurnat-Thoma et al., 2017). Since HPLs among male nurses should be optimal to offer better and appropriate health services to patients, the following points should be addressed accordingly: the male nurses' HPLs and their BMI and whether there is a relationship between the above variables and male nurses' demographic features in specific BMI.

Methodology

The present study is a descriptive correlation to determine the relationship between HPL and BMI and some demographic features of male nurses in the city of Ahwaz, Iran. The population involves all male nurses who worked in Ahwaz's educational, health, and clinical centers during the time this study was conducted. To determine the sample volume, the Cochran formula with 95% confidence interval and 0.5% error was employed. Finally, 108 samples were included in the study through simple non-probability sampling.

The questionnaire had two parts. The first part was about male nurses' demographic characteristics such as

Table 1. Mean of HPL Variables and Its Scores.

HPL	Frequency	Minimum	Maximum	Mean	SD	<i>p</i>	Level
Health responsibility	105	1.00	4.78	3.03	.69	.56	Middle
Physical activity	107	1.00	5.00	2.69	.80	.00	Weak
Nutrition	103	1.00	4.56	3.13	.64	.03	Good
Spiritual growth	102	1.88	5.00	3.48	.61	.00	Good
Stress management	101	1.38	4.88	2.97	.66	.07	Weak
Interpersonal relationships	109	1.89	4.89	3.39	.65	.00	Good
HPL	108	2.19	4.22	3.13	.45	.00	Good

Note. HPL = health-promoting lifestyle.

age, marital status, educational level, job experiences, contact with occupational hazards (physical, mental, ergonomic and physical), smoking, BMI, and paying attention to family health. The second part included Pender's health promotion model. The questionnaire included 52 questions. After reading each question, participants had to choose an option based on the Likert scale. The questions were categorized into six variables: health responsiveness (12 questions), physical activity (seven questions), nutrition (nine questions), spiritual growth (11 questions), stress management (eight questions), and interpersonal relationships (five questions). Each question consisted of four choices: *never* (1 point), *sometimes* (2 points), *usually* (3 points), and *always* (4 points). The overall lifestyle score range is between 52 and 208, and the score that a participant achieves is measured relative to the total average (130 points or mean = 3). A score below average (less than 130 or mean < 3) indicates an unfavorable (weak) lifestyle, and a score above average (more than 130 or mean > 3) reports a desirable (good) lifestyle (Pender, 2008).

The HPL questionnaire has been widely used as a meaningful tool for assessing HPL and is considered to offer reliability and validity, both domestically and internationally (Mohammadi Zeidi et al., 2012; Rathnayake et al., 2020; Taheri et al., 2016).

In addition, the Cronbach's α coefficient for the HPL questionnaire was calculated as .90 in this study, which has appropriate internal reliability.

To determine BMI, the height of the participants was measured by a tape measure in meters while their back, shoulders, hips, and back of legs touched the wall. In addition, weight was measured by a standard scale in kilograms. Finally, BMI was calculated by dividing weight (kg) by the squared height (m).

Data Analysis

After data collection and encoding the questionnaires, data were analyzed at the descriptive and inferential levels using SPSS software version 22. At the descriptive

level, mean and standard deviation were used. At the inferential statistic level, independent *t*-test, Pearson's coefficient correlation, and one-way analysis of variance (ANOVA) were used.

Results

According to the data analysis of the demographic questionnaires of male nurses in Ahvaz, 62 (55.4%) were single, 93 (83.8%) were bachelor graduates, and 56 (58.3%) were employed in governmental hospitals. The age group with the highest number of participants was 26–35 years and that with the lowest number was above 55 years (mean = 28.71, *SD* = 6.68). Participants were also exposed to occupational hazards such as psychological (stress and fatigue), ergonomic (low back pain), physical (heat and noise pollution), and biological (diseases and allergies).

Participants' average height was 173.44 cm (*SD* = 68.6), their average weight was 57.72 kg (*SD* = 9.3), and their BMI was 22.9 (*SD* = 3.46). Accordingly, the BMI of most participants (between 18.5 and 25) was normal (74.04%); 24.07% were overweight and obese (between 25.9 and 30) and 19% were thin (BMI under 18.5). There was a meaningful relationship between nurses' age and BMI: most obese participants were between 36 and 45 years (*p* = .013).

To study the relationship between demographic variables and HPL, an ANOVA was employed. Results show that there was no significant relationship between age (*p* = .14), marital status (*p* = .32), educational level (*p* = .95), job experience (*p* = .17), hospital type (*p* = .43), and HPL variable in participants.

As shown in Table 1, the mean of health responsibility, physical activity, nutrition, spiritual growth, stress management, and interpersonal relationships was, respectively, 3.03 (medium), 2.69 (weak), 3.13 (good), 3.48 (good), 2.97 (medium), and 3.39 (good). However, the average HPL in male nurses was 3.13 (good).

As shown in Table 2, the average HPL in normal participants was above normal: 3.20 (good). Moreover,

Table 2. Mean of HPL at the Three BMI Levels.

Level of BMI	Frequency	Mean of HPL	SD
Thin	2	2.74	.38
Normal weight	80	3.20	.41
Overweight and obese	26	2.97	.50
Total	108	3.14	0.44

Note. BMI = body mass index; HPL = health-promoting lifestyle.

Table 3. The Relationship Between Different HPL Variables and BMI.

HPL	BMI	
	<i>r</i>	<i>p</i>
Health responsibility	.081	.41
Physical activity	.12	.19
Nutrition	.16	.1
Spiritual growth	.05	.59
Stress management	.1	.3
Interpersonal relationships	.15	.12

Note. BMI = body mass index; HPL = health-promoting lifestyle.

the average HPL in thin and overweight/obese people was lower than average—2.74 and 2.97 (medium), respectively.

As shown in Table 3, considering the relationship between the participants' HPL variables and BMI, there was a relationship between nutrition, interpersonal relationships, physical activity, stress management, health responsibility, and spiritual growth from the highest to the lowest variables, but this relationship was not significant.

An ANOVA was employed to determine the relationship between age and occupational hazards. As shown in the results in Table 4, there was a significant relationship between participants' age and occupational hazards ($p = .021$).

As shown in Table 5, the participants exposed to psychological occupational hazards were almost 3 years (3.82 years) younger than those exposed to occupational hazards; however, this age difference was not significant. Moreover, the participants who were exposed to psychological occupational hazards were almost 3 years (3.66 years) younger than those exposed to ergonomic occupational hazards, and this age difference was significant.

In this regard, participants exposed to biological occupational hazards were almost 5 (5.22) years younger than those exposed to physical occupational hazards. Finally, those exposed to ergonomic occupational hazards were almost 5 (5.06) years older than those exposed to physical occupational hazards.

Discussion

Results of this study show that the mean of the HPL in male nurses was at a good level. Besides, the average of HPL variables from the highest to the lowest, was spiritual growth, interpersonal relationship, nutrition, responsiveness to health, stress management, and physical activity respectively.

Consistent with the above findings, in Montazeri et al.'s (2017) study, HPL among university students was medium; the highest score was found in spiritual growth and the lowest score was in physical activity. Based on the findings of Heidari et al.'s (2017) study, nurses' HPL was medium. Moreover, physical activity and stress management scored the lowest, and spiritual growth and interpersonal relationship scored the highest. In a study by Tol et al. (2013), spiritual growth and health responsibility scored the highest, while physical activity scored the lowest.

In the present study, there was a relationship between the mean of HPL and its variables ($p = .00$). Based on the findings of the present study, there was no relationship between male nurses' HPL and age, educational level, job experiences, hospital type, and marital status. Unlike the above findings, in most studies conducted in this regard, there was a significant relationship between HPL and variables such as age, job experiences, marital status, and educational level (Heidari et al., 2017; Rastegar Yadaki et al., 2015; Taheri, 2018).

Evidence shows that HPL differs between single and married people. Single participants are more exposed to the risks of illnesses and the associated consequences than married ones (Hatami et al., 2016). The findings of one study identified that the mean of HPL was higher in married people than single ones (Hosseinnejad and Klantarzadeh, 2014). Despite this evidence, and considering that there were more single participants than married ones in the present study, nurses' HPL was good. In other words, single male nurses' performance in this study and HPL productivity was at an appropriate level.

In the present study, there was no significant relationship between paying attention to family health and male nurses' HPL ($p = .92$). Further, the study reported that men not only do not pay much attention to self-health promoting behaviors but are also reluctant about the health of their spouses and families, and though they know advantages of health-promoting behaviors, their performance to doing above behaviors is weak for some reasons (Ganle and Dery, 2015).

The prevalence of overweight and obesity was 24.07% in the present study. Based on the Pearson test, there was a relationship between scopes related to nurses' HPL and their BMI. Along with this study,

Table 4. Relationship Between Participants' Age and Exposure to Occupational Hazards.

Exposed to occupational hazards	Frequency	Percentage	Mean	SD
Psychological	51	47.2	27.90	4.35
Biological	11	10.4	31.73	9.41
Ergonomic	24	21.7	31.57	9.54
Physical	22	20.8	26.50	4.79
Total	106	100.0	28.80	6.71

Table 5. Age difference in Participants Based on Exposure to Occupational Hazards by LSD Test.

Group 1	Group 2	Age Difference	p
Psychological occupational hazards	Biological occupational hazards	-3.82	.08
	Ergonomic occupational hazards	-3.66*	.02
	Physical occupational hazards	1.4	.4
Biological occupational hazards	Psychological occupational hazards	3.82	.08
	Ergonomic occupational hazards	0.16	.94
	Physical occupational hazards	5.22*	.03
Ergonomic occupational hazards	Psychological occupational hazards	3.66*	.02
	Biological occupational hazards	-0.16	.92
	Physical occupational hazards	5.06*	.01
Physical occupational hazards	Psychological occupational hazards	-1.4	.01
	Biological occupational hazards	-5.22*	.03
	Ergonomic occupational hazards	-5.06*	.01

Note. LSD = least significant difference.

another study has identified that nurses' HPL is related to their overweight and obesity, sick leave, and efficiency reduction (Robroek et al., 2011).

Based on the findings of the present study, the most excessive weight people were young, between 36 and 45 years ($p = .013$). However, based on a study in Iran, the prevalence of obesity was 49% in men, and the highest prevalence of obesity was in the age range of 50 years (middle-aged group; Aghaalienejad et al., 2014). It seems as if there is also a growing trend of obesity among young nurses.

The findings of the present study identified that the male nurses' means of nutrition was at a good level, related to their BMI, and consistent with the findings of many studies (Jorvand et al., 2016; Ness et al., 2018; Samadi et al., 2015). Though, there was no relationship between BMI and nutrition in a study by Wilkie et al. (2018). According to Farhud (2015), nutrition is one of the effective factors in weight gain and obesity, and proper nutrition and a healthy diet will lead to a healthy lifestyle in people. It seems that changes in lifestyle and nutrition models lead to weight gain in people (Ghorbani et al., 2012; Zalewska & Maciorkowska, 2019). Appropriate nutrition and a healthy diet may lead to a healthy lifestyle. In other words, following a healthy diet pattern could play a vital role in preventing and controlling epidemic obesity (Mu et al., 2017).

The results of this study reported that the mean of interpersonal relationships was at a good level and was related to nurses' BMI. All human beings need to be in touch with other people since man is a social animal whose life and dynamicity depends on a healthy and appropriate relationship with his environment, and effective and interactive relationships with other men (Jensen & Johansen, 2015). An interpersonal relationship is a part of patients' treatment, and the power of communicating with patients is one of the professional necessities of nurses (Watson, 2007). The evidence clarifies that nurses' health affects the quality of communicating with patients. Effective communication by nurses leads to positive clinical outcomes, patient satisfaction, and nurses' happiness (Bramhall, 2014; Shamian & Benton., 2013).

According to our findings, it can be said that people with excessive weight are vulnerable with regard to their interpersonal and social relationships, since they face challenges in their interactions with family and society and may feel isolated. Such unpleasant experiences could create challenges in their social and interpersonal interactions. In fact, excessive weight can unpleasantly affect a person's capability of not experiencing an active and dynamic life (Esnaashari & Daryapour, 2017; Hoare et al., 2019; Matharu et al., 2015).

The findings of the present study indicated that the mean of stress management even at a weak level was

related to male nurses' BMI. Stress is a person's physical and psychological response to environmental conditions and is considered a part of every man's daily experiences. Among effective factors in obesity, stress seems to be a higher significant factor (Chaudhury & Swaleha, 2018).

Consistent with the above finding, other studies also reported a significant relationship between stress and obesity in a way that stress and depression are dangerous starting points for nutrition disorders (Farahmand et al., 2019; Hokm Abadi et al., 2014; Koski & Naukkarinen, 2017). In other words, stressful conditions lead to disordered diet, lack of physical activity, and sleep and excitement disorders, each of which can independently lead to obesity in male nurses.

Although technological advances have positive outcomes, their negative impact due to inactivity in the modern era should not be forgotten. Increasing energy levels and physical activities can affect metabolism and causes to obesity (WHO, 2017, 2020). Having a weak mean physical activity in men is another scope related to BMI and it is consistent with numerous studies. In a study by Tabrizi et al., a significant difference between the level of physical activity and obesity was reported (2018). Based on the study of Dalvandi et al., those having an appropriate lifestyle met a better diet program and physical activity (2017). Due to the almost 25% prevalence of overweight, obesity, and the weak condition of physical activity of male nurses in this study, it can be inferred that the lack of physical activity plays a key role in the prevalence of obesity in such people.

Spiritual growth is another key dimension of nurses' HPL, which can bring people a sense of purpose, meaning in life, hope, and peace of mind (Sadat Hoseini et al., 2017). Based on the findings of the present study, male nurses' means of spiritual growth was at a good level and related to their BMI. Along with this, based on the findings of a study by Sayyadi et al., nurses' spiritual health was reported to be medium and was related to their self-sufficiency (Sayyadi et al., 2019).

Health responsibility is another scope whose mean was at a medium level and had a relationship with nurses' BMI. Consistent with this study, a study by Wei et al. reported that nursing students were less responsive to their own health (2012). Health responsibility or the desire to promote health is one of the most important dimensions of a healthy life, in which one is sensitive and pays attention to health recommendations and chooses a lifestyle to sustain and promote its healthy level and to prevent diseases. In fact, choosing a healthy lifestyle is an approach to promote society's health and to enable people to be functional, and it has always been presented by the WHO as a value and major goal (Maurer & Smith, 2013). Based on the evidence, encouraging nurses proves helpful in self-responsiveness toward

health to perform safe and effective nursing duties, having optimal positive consequences for patients, increasing patients' capacity to face health changes, being reflexive and capable to cope with occupational requests in nurses, decreasing illnesses and absence, developing and persistence in the nursing profession, and finally helping toward enhancing society's health (Bramhall, 2014; Salmund & Echevarria, 2018).

Based on the findings of the present study, the order of prevalence of exposure to occupational hazards in male nurses is psychological, ergonomic, physical, and biological hazards. However, in another study, the prevalence of occupational hazards for nurses was reported to be biological, chemical, physical, and ergonomic (Aghakhani et al., 2017). The results of another study indicated ergonomic hazards were the most prevalent occupational hazard and chemical hazards were the least important source of occupational hazards in nurses (Ghahremani et al., 2018). In this regard, based on the findings of the study, most working nurses complain about a variety of occupational hazards, which are physical, psychological, and social. These risks affect their health (Hebashy Elewa & Hassan Aly El Banan, 2016).

Based on the findings of the present study, nurses exposed to psychological hazards such as stress rank it as the leading risk. Stress in nurses can negatively affect their care behaviors and the quality of health and clinical services they offer to patients (Sarafis et al., 2016).

De Keyrel (2018) reported that the biggest problem in the nursing profession is physical, psychological, and emotional fatigue, which generates stress. Stress among nurses leads to job dissatisfaction, burnout, and a negative effect on patient care.

Analyzing the above findings, it can be said that psychological hazards such as stress resulting from heavy responsibility toward their patients or from night shifts were among the most important occupational risks for male nurses in this study.

Based on the findings of the present study, exposure to occupational hazards is significantly related to people's age ($p = .021$). It was consistent with the findings by a study by Sabra and Morsy (2016).

Conclusion

Due to the pivotal role of male nurses in developing health-promoting behaviors in society, it is a necessity to pay closer attention to strategic approaches for coping with risk factors (occupational hazards). Nursing managers should provide opportunities to promote appropriate conditions and atmosphere to facilitate healthy habits (physical activity and stress management) in nurses. Such endeavors can help improve HPLs and capabilities among nurses. Healthy lifestyle behaviors by male nurses can help in combatting

workplace stress, promoting personal well-being, and help them provide better counseling to their patients.

From society's perspective, a nurse is the one who knows more and acts better; therefore, paying attention to their HPL is a professional and social expectation.

Limitation

This study was part of a project about HPL in male nurses, and it sought to recruit a diverse sample of male nurses. It seems that most participants were bachelor graduates and newly employed. Therefore, the prospects of male nurses with higher educational status and higher work experience have not been studied. The status of divorced men has not been covered in this study. Due to the small number of male nurses in Iran, the small sample size was another limitation of this study. However, the findings of this study can be a valuable foundation for the health of male nurses.

Ethical Consideration

Ethical issues (including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors. Regulation of the Declaration of Helsinki was followed throughout the study. The informed consent form is located on the appendix

Appendix

Informed consent form

Dear Participant

The aim of present study is to investigate the relationship between health-promoting lifestyle and body mass index in male nurses in Ahvaz. All your answers are kept confidential and only accessible to researchers. Participation in this study is voluntary and whenever you feel that you cannot cooperate for any reason, you can cancel without worrying about any undesirable consequences. Based on the above explanations, it is expected that the present study will not have negative consequences. Your honest answer will increase nursing knowledge about the health of male nurses and accrue a new insight into it.

Participant's signature

Acknowledgments

The authors wish to thank the Ahvaz Branch, Islamic Azad University for the financial support. The authors would like to thank all the editors and reviewers for comments in the development and improvement of this paper. This study was part of a

project approved by the Ahvaz Branch of Islamic Azad University (The Ethics Committee license (No.IR.IAU.Ahvaz.REC. 1398.006). The authors would like to thank the research deputy for their support.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Nahid Hossein Abbasi  <https://orcid.org/0000-0001-9450-2711>

References

- A picture of overweight and obesity in Australia. (2017). Australian Institute of Health and Welfare. www.aihw.gov.au
- Abdi, S., Ahmadian, H., & Lotfollah, S. (2019). Investigating the effect of life style change- based training on the improvement in self-esteem and decrease BMI among obese women. *Rooyesh-e-Ravanshenasi Journal*, 7(11), 1–16. <http://frooyesh.ir/article-1-744-en.html>
- Aghaalinejad, H., Gharakhanlou, R., Farzad, & Bayati, M. (2014). Norma of anthropometric, body composition measures and prevalence of overweight and obesity in urban population of Iran. *Shahrekord University of Medical Sciences Journal*, 15(6), 18–27.
- Aghakhani, N., Cheraghi, R., Alinejad, V., & Baghaei, R. (2017). Prevalence and factors of occupational accidents in nurses of education and treatment centers of Uramia University of medical sciences Uromia. *Journal of Urmia Nursing and Midwifery Faculty*, 15(4), 270–280. <http://unmf.umsu.ac.ir/article-1-3048-fa.html>
- Baker, P. (2016). Men's health: A global problem requiring global solutions. *Trend In Urology & Men's Health*, 11–14. www.trendsinnmenshealth.com
- Bardehle, D., Dinges, M., & White, A. (2017). What is men's health? A definition. *Journal of Men's Health*, 13(2), 40–52. 4th Congress on men's health, Iran. (2020). www.Medicalref.ir
- Borroso, M., Goday, A., Ramos, R., Marín-Ibañez, A., Guembe, M. J., Rigo, F., Tormo-Díaz, M. J., Moreno-Iribas, C., Cabré, J. J., Segura, A., Baena-Díez, J. M., de la Cámara, A. G., Lapetra, J., Quesada, M., Medrano, M. J., Berjón, J., Frontera, G., Gavrilá, D., Barricarte, A., . . . Marrugat, J. (2018). Interaction between cardiovascular risk factors and body mass index and 10-year incidence of cardiovascular disease, cancer death, and overall mortality. *Preventive Medicine*, 107, 31–39. doi:10.1016/j.ypmed.2017.11.013.
- Braga, V., Augusta, S., Jesus, M., Tavares, R. E., da Silva, M. H., & Barbosa Merigh, M. A. (2018). Nursing interventions

- with people with obesity in Primary Health Care: An integrative review. *Journal of School of Nursing*, 51(1), 1–10. doi.org/10.1590/s1980-220x2017019203293
- Bramhall, E. (2014). Effective communication skills in nursing practice. *Nursing Standard/RCN*, 29(14), 53–59. doi: 10.7748/ns.29.14.53.e9355.
- Chaudhury, S., & Swaleha, M. (2018). Stress and burnout in nursing profession. *Journal Nursing & Health Care*, 6(3), 1–2.
- Cheshire, A., Peters, D., & Ridge, D. (2016). How do we improve men's mental health via primary care? An evaluation of the Atlas Men's Well-being Pilot Programme for stressed/distressed men. *BMC Family Practice*, 17(13), 2–11.
- Dalvandi, A., Haj Hashim Khani, M. A., Hasandoost, F., & Javadi, M. (2017). Relationship between bmi, maternal health promoting lifestyle and demographic variables among Schoolchildren in Qazvin, 2014. *Journal of Pediatrics Nursing*, 4(2), 44–44. doi: 10.21859/jpen-04027.
- De Keyrel, A. (2018). The biggest causes of nurse burnout and what you can do. <https://www.mededwebs.com>
- Dworkin, S. L., Fleming, P. J., & Colvin, C. J. (2015). The promises and limitations of gender-transformative health programming with men: Critical reflections from the field. *Culture, Health & Sexuality*, 17(52), 5128–5143. doi.org/10.1080/13691058.2015.1035751.
- Edelman, L. C., & Connelly, E. (2018). *Health promotion throughout the life span - E-book*. Elsevier.
- Edington, D. W., Schultz, A. B., & Pitts, J. S. (2015). The future of health promotion in the 21st century: A focus on the working population. *American Journal of Lifestyle Medicine*, 10(4), 242–252. doi.org/10.1177/1559827615605789
- Esnaashari, N., & Daryapour, E. (2017). Evaluating body mass index (BMI) and its role in social anxiety of female adolescents in Yazd. *Journal of Productivity and Development*, 3(1), 7–12. doi: 10.4018/IJPMAT.
- Farahmand, H., Pourhosein, R., & Alsadat Hashemi Najafabadi, S. (2019). A review and meta-analysis of the relationship between stress and obesity. *Rooyesh-e-Ravanshenasi Journal*, 7(12), 163–182. <http://frooyesh.ir/article-1-1566-en.html>
- Farhud, D. (2015). Impact of lifestyle on health. *Iranian Journal of Public Health*, 44(11), 1442–1444. <http://ijph.tums.ac.ir>
- Fathabadi, J., Saeid, S., Farhad, J., & Talaneshan, A. (2019). The role of health-oriented lifestyle and health locus of control in predicting the risk of overweight. *Iranian Journal of Health Education and Health Promotion*, 5(4), 280–287. doi: 10.30699/acadpub.ijhehp.5.4.280.
- Ganle, J. K., & Dery, I. (2015). What men don't know can hurt women's health: A qualitative study of the barriers to and opportunities for men's involvement in maternal health-care in Ghana. *Reproductive Health*, 12(93), 2–13. doi: 10.1186/s12978-015-0083-y.
- Ghahremani, E., Parandeh, A., Vafadar, Z., & Ebadi, A. (2018). Survey of the occupational hazards and related factors in health care workers in military hospitals during 2016–2017. *Journal of Military Medicine*, 20(1), 56–64. militarymedj.ir
- Ghorbani, A., Ziaee, A., Sadeghi, T., & Asefzadeh, S. (2012). Comparison the living quality of obese women with normal weight women. *Journal of Mashhad University of Medical Sciences*, 55(3), 144–150. doi: 10.22038/MJMS.2012.425.
- Global Burden of Diseases [GBD] obesity collaborators. (2017). Health effects of overweight and obesity in 195 countries over 25 years. *The New England Journal of Medicine*, 377(1), 13. doi: 10.1056/NEJMoa1614362.
- Hatami, H., Razavi, S. M., Eftekhari Ardebili, H., & Maglesi, F. (2016). *Comprehensive public health book*. Arjemand.
- Hebashi Elewa, A., & Hassan Aly El Banan, S. (2016). Occupational hazards as perceived by nursing interns and protective measures. *Journal of Nursing and Health Science*, 5(6), 107–118. doi: 10.9790/1959-050601107118
- Heidari, M., Borjian, M. B., Borujeni, M. G., & Shirvani, M. (2017). Relationship of lifestyle with academic achievement in nursing students. *Journal of Clinical and Diagnostic Research*, 11(3), 1–3. doi: 10.7860/JCDR/2017/24536.9501.
- Hoare, E., Crooks, N., Hayward, J., Allender, S., & Strugnell, C. (2019). Associations between combined overweight and obesity, lifestyle behavioural risk and quality of life among Australian regional school children: Baseline findings of the Goulburn Valley health behaviours monitoring study. *Health and Quality of Life Outcomes*, 17(16), 2–10. <https://doi.org/10.1186/s12955-019-1086-0>
- Hokm Abadi, M., Bakhti, M., Nazemi, M. F., & Moshirian, F. (2014). Investigating the relation of body mass index, depression and age in Norabad Delfan. *Journal of Ilam University*, 22(1), 130–138. sjimu.medilam.ac.ir
- Hosseinejad, M., & Klantarzadeh, M. (2014). Study of lifestyle based on the Pender's health promotion model among students of Islamic Azad University. *Iranian Journal of Health Education and Health Promotion*, 1(4), 15–28. <http://journal.ihepsa.ir/article-1-98-en.html>
- Jensen, L. R., & Johansen, A. K. (2015). A public relation analysis. www.pure.au.dk
- Jorvand, R., Valizadeh, A., Karami, B., Shahvali, F., & Valizadeh, F. (2016). Effect of healthy nutrition education on the body mass index (BMI) of health volunteers in Ilam Province. *Health Education and Health Promotion*, 4(2), 25–34. <http://journals.modares.ac.ir/article->
- Kable, A., James, C., Snodgrass, S., Snodgrass, S., Plotnikoff, R., Guest, M., Ashby, S., Oldmeadow, C., & Collins, C. (2015). Nurse provision of healthy lifestyle advice to people who are overweight or obese. *Nursing and Health Sciences*, 17(4), 451–459. doi: 10.1111/nhs.12214
- Kelly, M. (2017). Should nurses be expected to role model healthy lifestyles to patients? A study found that opinions on the matter differ widely among participants talking from different viewpoints. *Nursing Times*, 113(10), 46–48.
- Kelly, M., & Wills, J. (2018). Systematic review: What works to address obesity in nurses? *Occupational Medicine*, 68(4), 228–238. doi.org/10.1093/occmed/kqy038.
- Koski, M., & Naukkarinen, H. (2017). The relationship between stress and severe obesity: A case control study. *Biomedicine Hub*, 2(1), 113. doi.org/10.1159/000458771-6302-en.html.
- Kurnat-Thoma, E., El-Banna, M., Oakcrum, M., & Tyroler, J. (2017). Nurses' health promoting lifestyle behaviors in a community hospital. *Applied Nursing Research*, 35, 77–81. doi.org/10.1016/j.apnr.2017.02.012.
- Kyrou, I., Randeve, H. S., Tsigos, C., Kaltsas, G., & Weickert, M. O. (2018). Clinical problems caused by obesity.

- National Center for Biotechnology Information (NCBI). www.ncbi.nlm.nih.
- Matharu, K., Shapiro, J. F., Hammer, R. R., Kravitz, R. L., Wilson, M. D., & Fitzgerald, F. T. (2015). Reducing obesity prejudice in medical education. *Education for Health, 27*(3), 231–237. doi: 10.4103/1357-6283.152176.
- Maurer, F. A., & Smith, C. M. (2013). *Community/public health nursing practice*. Saunders.
- Mohammadi Zeidi, I., Pakpour Hajiagha, A., & Mohammadi Zeidi, B. (2012). Reliability and validity of persian version of the health-promoting lifestyle. *Journal Mazandaran University Medicine Science, 21*(1), 102–113. <http://jmums.mazums.ac.ir/article-1-955-en.html>
- Montazeri, N., Kianipour, N., Nazari, B., Ziapour, A., & Bakhshi, S. (2017). Health promoting behaviors among university students: A case-sectional study of Kermanshah University of Medical Sciences. *International Journal of Pediatrics, 5*(6), 5091–5099. doi: 10.22038/ijp.2017.8631.
- Mu, M., Xu, L. F., Hu, D., Wu, J., & Bai, M. J. (2017). Dietary patterns and overweight/obesity: A review article. *Iran Journal Public Health, 46*(7), 869–876. <http://ijph.tums.ac.ir>
- Navidian, A., Abedi, M. R., Baghban, I., Fatehizade, M., & Poursharifi, H. (2010). Effect of motivational interviewing on the weight self-efficacy lifestyle in men suffering from overweight and obesity. *Journal of Behavioral Sciences, 4*(2), 149–154. www.SID.ir
- Ness, S. J., Hickling, D. F., Bell, J. J., & Collins, P. F. (2018). The pressures of obesity: The relationship between obesity, malnutrition and pressure injuries in hospital inpatients. *Clinical Nutrition, 37*(5), 1569–1574. doi: 10.1016/j.clnu.2017.08.014.
- Pelman, R. S., & Elterman, D. S. (2014). Lifestyle and disease, male health and risks. *Revista Médica Clínica Las Condes, 25*(1), 25–29. [https://doi.org/10.1016/S0716-8640\(14\)70006-9](https://doi.org/10.1016/S0716-8640(14)70006-9)Getrightsandcontent
- Pender, N. J. (2008). *Health promotion in nursing practice*. Appleton & Lange.
- Rahmani, A., Sayehmiri, K., Asadollahi, K., Sarokhani, D., Islami, F., & Sarokhani, M. (2015). Investigation of the prevalence of obesity in Iran: A systematic review and meta-analysis study. *Acta Medical Iranica, 53*(10), 596–607. Acta.tums.ac.ir
- Rastegar Yadaki, M., Zendehtalab, M., Yavari, H., & Maslom, S. R. (2015). Health-promoting lifestyle and its related factors among health volunteers Mashhad in 2015. *Journal of Torbat Heydariyeh University of Medical Sciences JMS, 3*(3), 48–55. URL: <http://jms.thums.ac.ir/article-1-243-en.html>
- Rathnayake, N., Alwis, G., Lenora, J., & Lekamwasam, S. (2020). Applicability of health promoting lifestyle profile-II for postmenopausal women in Sri Lanka; a validation study. *Health and Quality of Life Outcomes, 18*(122), 1–6. <https://doi.org/10.1186/s12955-020-01371-7>
- Robroek, S. J. W., van den Berg, T. I. J., Plat, J. F., & Burdorf, A. (2011). The role of obesity and lifestyle behaviours in a productive workforce. *Journals, Occupational & Environment Medicine, 68*(2), 134–139. doi.org/10.1136/oem.2010.055962.
- Sabra, E. H., & Morsy, M. S. (2016). Occupational health hazards among nurses at Quena University Hospital. *Journal of Nursing and Health Science, 5*(3), 28–34. doi: 10.9790/1959-0503042834.
- Sadat Hoseini, A., Razaghi, N., Khosropanah, A. H., & Dehghan Nayeri, N. (2017). Concept analysis of spiritual health. *Journal of Religion and Health, 58*(1), 1025–1049. doi: 10.1007/s10943-017-0522-
- Salmond, S. W., & Echevarria, M. (2018). Healthcare transformation and changing roles for nursing. *Ortopedic Nursing, 36*(1), 12–25. doi: 10.1097/NOR.0000000000000308.
- Samadi, M., Zeinaly, F., Ghotbodini Mohammadi, S. H., Alipour, M., & Asadi Samani, H. (2015). The relationship between obesity and dietary patterns: Review on evidence. *Journal of Clinical Excellence, 4*(Special Issue), 72–89. [ce.mazums.ac.ir > article-1-219-fa](http://ce.mazums.ac.ir/article-1-219-fa)
- Sarafis, P., Rousaki, E., Tsounis, A., Malliarou, M., Lahana, L., Bamidis, P., Niakas, D., & Papastavrou, E. (2016). The impact of occupational stress on nurses' caring behaviors and their health related quality of life. *BMC Nursing, 15*(56), 2–9. doi: 10.1186/s12912-016-0178-y.
- Sayyadi, M., Sayyad, S., Vahabi, A., Vahabi, B., Nori, B., & Amani, M. (2019). Evaluation of spiritual health level and its related factors in the students of Sanandaj Universities. *Shenakht Journal of Psychology and Psychiatry, 6*(1), 1–10. doi: 10.29252/shenakht.6.1.1.
- Shamian, J., & Benton, D. C. (2013). Nurses: A force for change care effective/cost effective. *International Nurses Day*. www.ghdonline.org.
- Sines, D., Saunders, M., & Forbes, B. J. (2015). *Community health care nursing*. Wiley Blackwell.
- Tabrizi, J. S., Sadeghi Bazargani, H., Farabakhsh, M., Nikniaz, L., & Nikniaz, Z. (2018). Prevalence and associated factors of overweight or obesity and abdominal obesity Iranian population: A population-based study of Northwestern Iran. *Iranian Journal of Public Health, 47*(10), 1583–1592.
- Taheri, M. (2018). The study of life style and health behavior in university students based on pander health promotion model. *Journal of Sport Management and Motor Behavior, 14*(27), 229–242. doi: 10.22080/JSMB.2018.10430.2398.
- Taheri, T. P., Azadbakht, M., Garmaroudi, G. H., Sahaf, R., & Fekrizadeh, Z. (2016). Validity and reliability of health promoting lifestyle profile II in the Iranian elderly. *International Journal Preventive Medicine, 7*(1), 74. doi: 10.4103/2008-7802.182731.
- Tol, A., Tavassoli, E., Shariferad, G. H. R., & Shojaeizade, D. (2013). The relation between health promoting lifestyle and quality of life in undergraduate students at school of health, Isfahan University of Medical Sciences. *Journal Education Health Promotion, 2*(11), 1–23. doi: 10.4103/2277-9531.108006.
- Watson, J. (2007). Transpersonal caring and the caring moment defined. <http://www.ucdenver.edu>
- Wei, C. N., Harada, K., Ueda, K., Fukumoto, K., Keiko Minamoto, K., & Ueda, A. (2012). Assessment of health-promoting lifestyle profile in Japanese university students. *Environmental Health and Preventive Medicine, 17*(3), 222–227. doi: 10.1007/s12199-011-0244-8.

- WHO. (2017). Building resilience: A key pillar of health 2020 and the sustainable development goals examples from the WHO small countries initiative. www.euro.who.int
- WHO. (2020). Global action plan on physical activity more active people for a healthier world. Blossom. www.WHO.int
- Wilkie, H. J., Standage, M., Gillison, F. B., Cumming, S. P., & Katzmarzyk, P. T. (2018). Correlates of intensity-specific physical activity in children aged 9–11 years: A multilevel analysis of UK data from the international study of childhood obesity, lifestyle and the environment. *BMJ*, *8*(2), 1–11. doi:10.1136/bmjopen-2017-018373.
- Zalewska, M., & Maciorkowska, E. (2019). Dietary habits and physical activity of 18-year-old adolescents in relation to overweight and obesity. *Iranian Journal Public Health*, *48*(5), 864–872. <http://ijph.tums.ac.ir>
- Zaman, G. S. (2015). Influence of lifestyle patterns on perceptions of obesity and overweight among expatriates in Abha city of Kingdom of Saudi Arabia. *Journal of Natural Science, Biology, and Medicine*, *6*(2), 329–334. doi: 10.4103/0976-9668.159995.
- Zapka, J. L., Stephenie, C., & Hale, J. (2009). Lifestyle behaviours and weight among hospital-based nurses. *Journal of Nursing Management*, *17*(7), 853–860. doi: 10.1111/j.1365-2834.2008.00923.
- Zhang, J., Yang, B., Cai, Z., Li, H., Han, T., & Wang, Y. (2018). The negative impact of higher body mass index on sperm quality and erectile function: A cross-sectional study among Chinese males of infertile couples. *American Journal of Men's Health*, *13*(1), 1–8. doi: 10.1177/1557988318822572.