Associations of Underweight, Overweight and Obesity with Self-care History in the Youth

Mostafa Sadeghi[1], Mohammadreza Farzadmehr[2], Morteza Abbasi[2], Yalda Khodadadi[3], Atefeh Sadeghi[4], Najmeh Sepahie[5], Alireza Nodehi[6*]

1. Department of Biostatistics & Epidemiology, Faculty of Health, Tabriz University of Medical Science, Tabriz, Iran
2. Behvars Training Center, Torbat Heydarieh University of Medical Sciences, Torbat Heydarieh, Iran
3. Gorgan Health-Care Center, Golestan University of Medical Sciences, Gorgan, Iran
4. 9-Dey Hospital, Torbat Heydarieh University of Medical Sciences, Torbat Heydarieh, Iran.
5. Department of Midwifery, School of Nursing and Midwifery, Mashhad University of Medical Science, Mashhad, Iran
6. Aqqala Health-Care Center, Golestan University of Medical Sciences, Gorgan, Iran

A R T I C L E I N F O	A B S T R A C T
Article type: Research Paper *Article History:* Received: 15 Jan 2019 Accepted: 16 Feb 2019 Published: 10 Mar 2019 *Keywords:* Underweight Overweight Obesity Self-care Youth	**Introduction:** The adverse effects of underweight, overweight, and obesity on health could increase the risk of chronic, non-communicable diseases and disability among the youth. Self-care plays a pivotal role in lifestyle management. The present study aimed to evaluate the associations of underweight, overweight, and obesity with self-care history in the youth. **Methods:** This descriptive, cross-sectional study was conducted on 1,140 young participants aged 18-29 years in Aqqala city, located in the north of Iran. Data were collected using the self-care measuring scale, which is commonly applied by the Iranian Ministry of Health. A case-control study had been designed in which the participants with normal weight were considered as controls, and the underweight, overweight, and obese subjects were considered as the case groups to evaluate the associations with self-care history. **Results:** The prevalence of obesity, overweight, normal weight, and underweight among the youth was estimated at 8.8%, 23.6%, 58.4%, and 9.2%, respectively. The frequency of self-care history based on the self-care measuring scale was considered to be inadequate, moderate, and favorable in 2.4%, 69.3%, and 28.3% of the participants, respectively. A significant association was observed between underweight and self-care history (OR: 4.46; 95%CI: 1.54-12.20; P<0.001). In addition, factors such as gender (P=0.001), education level (P=0.002), marital status (P=0.001), and self-care history (P=0.038) had significant correlations with the weight classifications in the participants. **Conclusion:** According to the results, the underweight individuals had an inadequate self-care history and were at a higher risk of diseases. Therefore, they required proper planning for self-care.

Introduction

Within the past century, most nutrition research and food programs in developing countries have been focused on poverty and malnutrition. Currently, there has been further research regarding overweight and obesity in these communities (1). In the past three decades, the prevalence of excess body weight (obesity and overweight) has increased rapidly in high-, middle-, and low-income countries (2-4).

Body mass index (BMI; kg/m²) has been used extensively as a body fat index owing to its simplicity in clinical settings, epidemiological studies, and most of the researches examining body fat gain (5). Based on the BMI, body weight is classified as underweight (≤18.5kg/m²),

* *Corresponding author:* Alireza Nodehi, Aqqala Health-Care Center, Golestan University of Medical Sciences, Gorgan, Iran. Tel: 00981734529248; Email: Alireza.nodehi57@gmail.com

normal (18.5–24.9kg/m²), overweight (25–29.9kg/m²), and obese (≥30kg/m²).

The overweight and obesity epidemic in the United States is alarming due to the imposed burden on health, quality of life, and economy. According to the Centers for Disease Control and Prevention (CDC), 35.9% of adults are obese, and 33.3% are overweight (7). The prevalence of obesity and overweight has increased in most developed countries, as well as the neighboring countries of the Persian Gulf, especially Iran (8). According to the statistics reported by the World Health Organization (WHO), the prevalence of obesity is 19.4%in Iran. Obesity has been reported to be more prevalent among women (26.4%) compared to men (12.4%). Furthermore, the WHO has announced that two-thirds of the deaths caused by non-communicable diseases and obesity is a major risk factor for cardiovascular diseases and cancers (9). Obesity is a major risk factor for various diseases, including type II diabetes mellitus, hypertension, cardiovascular diseases, stroke, osteoarthritis, and cancer (10).

Underweight in adolescents and the youth is considered to be a great health concern in different communities, especially developing countries (11). Underweight, overweight, and obese individuals are at a higher risk of health complications. In addition, underweight individuals are at a higher risk of mortality compared to those with an average BMI (12).

In health care, self-care is defined as the deliberate, self-initiated human monitoring activities to control the health status (13). Self-care is part of daily life and could be extended to children, family, neighbors, friends, and local communities. As a pillar of health and social care, the concept of self-care indicates that an essential element of the modern healthcare system is under proper supervision (14).According to statistics, 65-85% of healthcare is performed by the individual and their family without the involvement of expertise based on traditional, non-medical approaches (15). In a study conducted in Iran, the majority of the subjects were reported to be interested in self-care despite their lack of knowledge and effective performance regarding self-care (16).

In several cases, the improved quality of life of patients with weight problems has been the result of clinical outcomes. Capable patients feel that they can positively influence their disease outcomes, especially in the cases with chronic diseases. In this regard, self-care training could remarkably enhance their quality of life.

The present study aimed to evaluate the associations of underweight, overweight, and obesity with self-care history in the youth.

Material and methods
Participants, Setting, and Sampling

This descriptive, cross-sectional study was conducted on 1,140 participants aged 18-29 years in Aqqala city, located in the north of Iran, in 2015. The sample size was estimated at 972 subjects based on the research objectives and odds ratio (OR) of 1.53 between obesity and marital status (18) (α=0.05; P_2=0.5) using the G power software. Considering the sample loss of 15%, the final sample size was determined to be 1,140 participants. The inclusion criteria of the study were residence in the selected study area, age of 18-29 years, and willingness to participate. The subjects were selected via cluster sampling, and their socioeconomic status was also considered in sampling. Initially, each urban and rural healthcare center was considered as a cluster. Afterwards, the numbers of the household records were collected using systematic random methods. Finally, a young individual was selected via simple random sampling from each household. Data were collected by trained interviewers.

Research Measures

Data were collected using the self-care measuring scale, which is an instrument commonly utilized by the Iranian Ministry of Health and consists of two sections. The first section included demographic data (e.g., age, gender, marital status, and education level), and the second section consisted of 73 items to measure the self-care scale in four dimensions of physical health (11items), mental and behavioral health (18items), communication health (21 items), and social health (23 items). These items were scored based on a four-point Likert scale (Never=1, Often=2, Usual=3, Always=4). The total score of the self-care scale was calculated out of 292 based on the obtained scores in the mentioned dimensions and

classified into three self-care categories of inadequate, moderate, and favorable self-care (Table 1).

Table 1. Results of Self-care Scale Analysis

Score	Status	Interpretation
98-162	Inadequate	At risk; requiring proper self-care planning
163-227	Moderate	Still healthy; requiring the reconsideration of thoughts and behaviors
228-292	Favorable	Acceptable; favorable overall health status and self-care level

Anthropometric Measurements

The self-care scale had two items regarding height and weight to measure the BMI of the participants. The anthropometric measurements were performed at the healthcare center using various methods. Body weight was measured to the nearest 0.1 kilogram (Weight Medisana), and height was measured to the nearest 0.5 centimeter using a wall-hanging height for an adult (Saka 206) with light clothing and without shoes.

After data collection, the frequency of underweight, overweight, and obesity was determined in each age group. The results of each measurement were expressed as the mean value of two consecutive measurements. A case-control study was designed to survey the relevance of the measured values to self-care history based on the BMI of the subjects. The subjects with normal weight were considered as controls, and the other weigh groups (underweight, overweight, and obese) were considered as the case groups. Each case group was assessed independently and compared with the control group on three self-care levels.

- Control group (normal weigh): BMI=18.5-24.9 kg/m^2; n=660 (57.9%)
- Case group one (underweight):BMI≤18.5 kg/m^2; n=112 (9.8%)
- Case group two (overweight): BMI=25-29.9 kg/m^2; n=270 (23.7%)
- Case group three (obese): BMI≥30 kg/m^2; n=98 (8.6%)

Ethical Considerations

The study protocol was approved by the regional Ethics Committee of Tabriz University of Medical Sciences (ethical registration number: IR.TBZMED.REC.2015.646). Verbal informed consent was obtained from all the participants prior to the study.

Statistical Analysis

Data analysis was performed in STATA software version 13, and the obtained data were expressed as mean and standard deviation to assess the quantitative and qualitative variables, respectively. Chi-square was used to assess the correlations between the self-care history and BMI, and the OR of two variables was calculated. In all the statistical analyses, the significance level was considered at 0.05.

Results

Socio-demographic characteristics

In total, 1,140 participants (407 males; 36.58%) with the mean age of 24.75±3.05 years (age range: 18-29 years) were enrolled in the study. The education level in the majority of the subjects was high school diploma and below diploma, while 203 subjects (17.81%) had academic education. In addition, the majority of the participants (74.56%) were residents of rural areas, and 825 subjects (72.37%) were married.

Status of BMI and Independent Variables

Table 2 shows the independent variables, including gender, marital status, education level, place of residence, employment status, smoking habits, and self-care history, in the case groups based on the results of Chi-square. Significant correlations were observed between gender (P=0.001), marital status (P=0.001), education level (P=0.002), and self-care history (P=0.038) and body weight in the case groups.

Table 2. Socio-demographic Variables Correlated with Body Mass Index (BMI)

Variable		Underweight N (%)	Normal Weight N (%)	Overweight N (%)	Obese N (%)	P-value
				BMI		
Gender	Male	43(10.6)	263(64.6)	80(19.7)	21(5.1)	0.001*
	Female	69(9.4)	397 (54.2)	190(25.9)	77(10.5)	
Marital Status	Single	54(17.1)	201(63.8)	39(12.4)	21(6.7)	0.001*
	Married	58(7.1)	459(55.6)	231(28)	77(9.3)	
Education Level	Below Diploma	54(9.1)	317(53.2)	160(26.8)	65(10.9)	
	High School Diploma	47(13.8)	213(62.5)	59(17.3)	22(6.4)	0.002*
	Above Diploma	11(5.4)	130(64.1)	51(25.1)	11(5.4)	
Place of Residence	Urban	21(7.2)	169(58.3)	79(27.3)	21(7.2)	0.482
	Rural	91(10.2)	491(57.8)	191(22.4)	77(9.6)	
Employment Status	Employed	24(7.8)	181(58.8)	80(25.9)	23(7.5)	0.067
	Unemployed	88(10.6)	479(57.6)	190(22.8)	75(9)	
Smoking Habits	Smoker	15(15.3)	55(56.1)	23(23.5)	5(5.1)	0.321
	Non-smoker	97(9.3)	605(58.1)	247(23.7)	93(8.9)	
Self-care History	Inadequate	19(51.5)	12(32.3)	3(8.1)	3(18.1)	
	Moderate	79(9.9)	466(58.3)	185(23.2)	69(8.6)	0.038*
	Favorable	14(4.6)	182(59.9)	82(26.9)	26(8.6)	

Note.*Gender, marital status, education level, and self-care history had significant correlations with case groups based on Chi-square.

Status of BMI and Self-care History

The prevalence of obesity was estimated at 8.8%, 23.6%, 58.4%, and 9.2% in the obese, overweight, normal, and underweight subjects. The self-care history based on the self-care scale was determined to be inadequate, moderate, and favorable in 2.4%, 69.3%, and 28.3% of the participants.

Table 3 shows the analysis of the association between underweight and self-care history. Considering that self-care differences were observed between the underweight and normal subjects, a significant difference was only observed in the case of inadequate self-care history (OR: 4.46, 95%CI: 1.54-12.20; P<0.001).

Table 3. Odds Ratio (OR) of Factors Associated with Underweight and Self-care History

Self-care History		With Self-care N (%)	Without Self-care N (%)	OR (95% CI)	P-value
Inadequate	Normal	12 (1.8)	648 (98.2)	1.00 (reference)	
	Underweight	19 (16.9)	93 (83.1)	4.46 (1.535-12.196)	0.001*
Moderate	Normal	466 (70.6)	194 (29.4)	1.00 (reference)	
	Underweight	79 (70.5)	33 (29.5)	0.811 (0.512-1.304)	0.355
Favorable	Normal	182 (27.6)	478 (72.4)	1.00 (Reference)	
	Underweight	14 (12.5)	98 (87.5)	0.963 (0.580-1.562)	0.875

Note.*A significant correlation observed in underweight group based on OR

Table 4 shows the analysis of the association between overweight and self-care history. A difference was observed in self-care history between the overweight and normal subjects, while no significant difference was denoted between overweight and self-care history (P>0.05).

Table 4. OR of Factors Associated with Overweight and Self-care History

Self-care History		With Self-care N (%)	Without Self-care N (%)	OR (95% CI)	P-value
Inadequate	Normal	12 (1.8)	648 (98.2)	1.00 (reference)	
	Underweight	3 (1.1)	267 (9.9)	0.407 (0.044-1.852)	0.227
Moderate	Normal	466 (70.6)	194 (29.4)	1.00 (reference)	
	Underweight	185 (68.5)	85 (31.5)	0.965 (0.699-1.337)	0.823
Favorable	Normal	182 (27.6)	478 (72.4)	1.00 (Reference)	
	Underweight	82 (30.4)	188 (69.6)	1.093 (0.785-1.515)	0.577

Table 5 shows the analysis of the association between obesity and self-care history. A

difference was observed in self-care history between the obese and normal subjects, while

no significant difference was denoted between obesity and self-care history (P>0.05).

Table 5. OR of Factors Associated with Obesity and Self-care History

Self-care History		With Self-care N (%)	Without Self-care N (%)	OR (95% CI)	*P-value*
Inadequate	Normal	12 (1.8)	648 (98.2)	1.00 (reference)	
	Obese	3 (3.1)	95 (96.9)	1.673 (0.297-6.354)	0.426
Moderate	Normal	466 (70.6)	194 (29.4)	1.00 (reference)	
	Obese	69 (70.4)	29 (29.6)	0.961 (0.594-1.582)	0.867
Favorable	Normal	182 (27.6)	478 (72.4)	1.00 (Reference)	
	Obese	26 (26.5)	72 (73.5)	0.981 (0.585-1.606)	0.937

Discussion

The present study aimed to assess the associations between underweight, overweight, and obesity with self-care history among the youth. The findings showed a significant correlation between underweight and self-care history (OR: 4.46, 95%CI: 1.53-12.20; P<0.001). Therefore, it could be inferred that the subjects with inadequate self-care history were more likely to be classified as the group with the BMI of less than 18.5 kg/m^2 (underweight). On the other hand, no significant differences were observed between obesity and overweight with self-care history.

In the current research, significant correlations were denoted between gender, marital status, education level, and self-care history in the case groups, while no significant differences were observed between the place of residence, employment status, and smoking habits in the case groups.

In the present study, the prevalence of obesity, overweight, normal weight, and underweight was estimated at 8.8%, 23.6%, 58.4%, and 9.2%, respectively. Most of the review studies conducted in Iran in this regard have investigated the prevalence of obesity in various age groups. In the present study, we aimed to evaluate the associations of underweight, overweight, and obesity with self-care history independently.

According to the study by Barzin et al., a significant number of young males aged 8-25 years in the urban population were overweight (32.2%) and obese (9.5%). Although this rate is remarkably lower compared to the American or Arab youth in the eastern Mediterranean region, it is similar to the rate reported in European youth of the same age group (17). This finding is also similar to the prevalence rate of obesity and overweight estimated in the present study.

Another research in this regard was conducted by Eftekhar et al. to review cognitive information, public health satisfaction, self-care preventive factors, and self-care information resources in a population aged more than 15 years. In the mentioned study, the researchers concluded that 82% of the subjects were satisfied with their health status within the past six months, 55% claimed to have no knowledge of self-care, 82% were interested in self-care, and 86% claimed that they were active in self-care. Therefore, it could be inferred that the majority of the individuals who are interested in self-care claim to have no knowledge of self-care, which in turn results in their improper performance in this regard (16). In the present study, 97.6% of the participants had an acceptable self-care history, and the difference (11.6%) could be due to the fact that our research was conducted on the youth living in rural areas.

The findings of the current research are in congruence with the results obtained by Serahati et al., which demonstrated a significant correlation between age and gender with various weight groups (obesity) (18).On the other hand, Vosoughi et al. have reported that the rate of self-care was moderate (61.4%), and the relatively low rate of self-care qualities in the present study could be attributed to the illiteracy of the sample population. Furthermore, factors such as age, gender, and marital status were considered to be the predictive factors for self-care (19).

According to the results of a quantitative study performed by Amiri et al., the main barriers against lifestyle improvement were not only satisfaction with the body, self-positive impression, and no sense of threat from obesity in adolescents and youth, but they also imagined that obesity could strongly prevent diseases

(20). Such a mindset could be considered an important cause of no correlation between overweight, obesity, and self-care history.

Limitations of the Study

The foremost limitation of the study was that the number of the male and female respondents who completed the questionnaire was not equal since men were not at home at the time of completing the questionnaire, which in turn led to gender imbalance. Another limitation was the high rate of illiteracy and lack of knowledge regarding self-care behaviors among the studied youth. In addition, we used the common tool utilized by the Iranian Ministry of Health for data collection, and the instrument could not be modified based on the age group of the participants.

Conclusion

According to the results, there was a significant association between underweight and self-care in the youth, while no significant differences were observed between obesity, overweight, and self-care history. Moreover, significant correlations were observed between gender, marital status, education level, and self-care history in the case groups. The underweight subjects had an inadequate self-care history and were at a higher risk of diseases; therefore, they were in need of proper planning for self-care.

Acknowledgments

Conflict of interest

None declared.

References

1. Wang Y, Monteiro C, Popkin BM. Trends of obesity and underweight in older children and adolescents in the United States, Brazil, China, and Russia. Am J Clin Nutr. 2002; 75(6): 971-7.
2. Black RE, Victora CG, Walker SP, Bhutta ZA, Christian P, de Onis M, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. Lancet. 2013; 382(9890): 427–51.
3. Jaacks LM, Kavle J, Perry A, Nyaku A. Programming maternal and child overweight and obesity in the context of undernutrition: current evidence and key considerations for low- and middle-income countries. Public Health Nutr. 2017; 20: 1286–96.
4. Zhuo Q, Wang Z, Piao J, Ma G, Zhai F, He Y, et al. Geographic variation in the prevalence of overweight and economic status in Chinese adults. Br J Nutr. 2009; 102(3): 413-8.
5. Gaeini A, Samadi A, Khalesi M. Fat Mass Index (FMI) comparing to Body Mass Index (BMI) in the determination of obesity in preschool children. Razi Journal of Medical Sciences. 2014; 21(120): 53-60.
6. National Heart, Lung, and Blood Institute. Aim for a healthy weight BMI calculator. Available at: http://www.nhlbi.nih.gov/guidelines/obesity/BMI/bmicalc.htm. Accessed May 13, 2013.
7. Centers for Disease Control and Prevention. Health, United States, 2011. Table 69. Selected health conditions and risk factors. 2012. Available at: http://www.cdc.gov/nchs/fastats/overwt.htm. Accessed May 13, 2013.
8. Damirchi A, Maharani J. The prevalence of overweight, obesity and hypertension and risk factors associated with them adult men. Olympic Journal. 2010; 17(6).
9. World Health Organization. Non communicable Diseases (NCD) Country Profiles,2014. Available from: http://www.who.int/nmh/countries/2011/irn_en.pdf? au=1(Accessed: 10May,2015).
10. Trust for America's Health; Robert Wood Johnson Foundation. F as in Fat: How Obesity Threatens America's Future 2012. September 18, 2012. Available at: http://www.healthyamericans.org/report/100/. Accessed May 1, 2013.
11. Dong Y, Zou Z, Yang Z, Wang Z, Yang Y, Ma J, et al. Prevalence of excess body weight and underweight among 26 Chinese ethnic minority children and adolescents in 2014: a cross-sectional observational study. BMC Public Health. 2018; 18(1): 562.
12. Roh L, Braun J, Chiolero A, Bopp M, Rohrmann S, Faeh D. Mortality risk associated with underweight: a census-linked cohort of 31,578 individuals with up to 32 years of follow-up. BMC Public Health. 2014; 14: 371.
13. Segall A, Goldstein J. Exploring the correlates of self-provided health care behaviour. Soc Sci Med. 1989; 29(2): 153-61.
14. Kim H, Kollak I. Nursing theories: Conceptual and philosophical foundations. 2nd Edition. Springer Publishing Company; 2005. p. 309.

15. Bandura A. Self-efficacy mechanism in psychobiologic functioning. Self-efficacy: Thought control of action. 1992; 2.

16. Eftekhar H, Mohammad K, Tavafian SS, Mirkarimi K, Ramezanzadeh A. The perceived of Self-care among general people living in south of Tehran, Iran. Iranian Journal of Epidemiology. 2009; 5(1): 33-9.

17. Barzin M, Mirmiran P, Ramezankhani A, Hatami H, Azizi FE. Prevalence of obesity in young tehranian males (18-25y) entering military service (Shahrivar 1386). Iranian Journal of Endocrinology and Metabolism. 2009; 10(6): 605-13.

18. Serahati S, Hossinpanah F, Biglarian A, Barzin M, Bakhshi E. Factors associated with obesity in families living in Tehran: A cross-sectional study. Journal of Health Promotion Management. 2013; 2(3): 51-58.

19. Vosoughi N, Aboutalebi Gh, Karimollahi M. The Study of Self-Care Agency in Patients Undergoing Hemodialysis Referred to Boali Hospital of Ardabil in 2013. Scientific Journal of Hamadan Nursing & Midwifery Faculty. 2015; 23(2): 24-31.

20. Amiri P, Ghofranipour F, Ahmadi F, Homan H, Hosseinpanah F, Jalali Farahani S. personal Barriers to Life Style Modification in Overweight/Obese Adolescents: A Qualitative Study. Iranian Journal of Endocrinology and Metabolism. 2010; 11(5): 521-9.