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Knowledge, Beliefs and Behavior of Food Consumption among Students of Military University: The Application of Health Belief Model (HBM)

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Abstract

Aims: Chronic diseases resulting from unhealthy nutrition and lifestyle, causes more than 70 percent of deaths in developed and developing countries. This study aims to assess the Knowledge, beliefs and behaviors of medical students in the military environment on the healthy dietary pattern based on health belief model (HBM).

Methods: In this cross-sectional study, the number were 242 students from three schools with age range from 18 to 32 years of military universities, which were selected by stratified random sampling. The questionnaire including the HBM constructs (Self efficacy, perceived benefits, perceived barriers and perceived threat), demographic variables, knowledge and behavior questions were used.

Results: The mean for students' Knowledge in three levels of in poor, moderate and good were determined respectively, 6.6 percent, 58.7 percent and 34.7 percent, the HBM constructs were 0.8 and 31 and 68.2 percent and performance level were14, 5.78 and 7.4 respectively.

Conclusion: Knowledge and practice in the study population was not desirable and education intervention by proper consideration of the factors affecting the pattern of food consumption practice is necessary.

Keywords: Health Belief Model, Knowledge, Food Consumption Pattern

Introduction

Teenage years and youth are periods in which people specially need nutritious food for growth [1, 2]. It is in this period when mental changes lead to the acceptance or rejection of certain nutritional habits [3]. In this period, people are responsible for their eating habits, attitudes and behaviors. In fact, nutritional attitudes play an important role in keeping a wide range of eating habits and behaviors [4]. Certain behavioral features, such as an improper nutrition pattern which is formed in teenage years, cause many problems, such as death, in adulthood since many of the hygienic or unhygienic practices that are established in youth appear as unchangeable behaviors in adulthood [5].

Chronic diseases resulted from improper nutrition and life style cause many deaths in most Mediterranean countries with 54% of the population under the age of 25 [26]. In fact, the relationship between bad diets or life styles and chronic diseases such as cancer, cardiovascular diseases and diabetes is well known. Improvements in financial status and well-being, indulgence in consuming salt, fat and sugar, increased smoking and reduction in physical activity are among the factors effective on the

prevalence of non-communicable and weakening illnesses [7]. In Iran, too, chronic, especially cardiovascular, diseases are among the major causes of weakness and deaths. According to statistics published by the Ministry of Health, coronary diseases make for 40% of deaths in Iran [8]. It is predicted that with the increase of urbanization and mechanization of life, these illnesses will be more prevalent.

Stefańiska (2011) showed in a study of Bialystok Medical University students that there was not a good balance in their daily nutrition and specifically the levels of carbohydrates, fat and fiber were lower than recommended [9]. In another study of Karachi University students, Reza (2010) revealed that their awareness was acceptable while their physical activity and dietary modification were not enough [10].

Studies have been done on school and university students in Iran to assess their attitudes and behavior patterns in terms of food consumption. Mirmiran (2007) [11] and Azizi [12] shows, for example, that only a small percentage of Tehrani teenagers had a good nutritional behavior and in most cases there is no relationship between their nutrition

awareness and behavior.

The results of Tavakoli's study in a military organization (2006) show that diseases such as obesity, diabetes, high blood pressure, heart attacks, gastroenterological problems were increasing in the personnel. According to this study, which was done on 12000 people, 66.9% of the personnel suffered from obesity, 11.8% from high triglycerides, 7.91% high cholesterol, 7.3% high blood pressure and 8.11% from diabetes [13]. Another study (2007) carried out on 21000 personnel of a military organization showed that 34.9% of the population were obese, 13.8% had high cholesterol and 10.3% had contracted diabetes [14]. Saeedi et al's research on 372 military and civilian patients experiencing a heart attack during the years 1992-2002 showed that the average age of the militaries with a heart attack was 49.7 in 2002 while this age was 53.8 in 1992, which reveals a reduction of about 4 years, and that the age of heart attack was almost 11 years lower in the military [15]. In view of the programs run by various countries and the WHO to decrease the causes of non-communicable diseases, it is necessary to look into the problem and make necessary nutritional interventions in order to reform the life styles of people and control the dangerous causes of such illnesses. This is especially needed in the military personnel, who are supposed to accomplish hard military tasks and missions. The conceptual framework of this study is based on the health belief model. The HBM is a psychological model for determining subjects' behaviors by identifying the participants' beliefs and their impact on the subjects' behavior. The HBM consists of the following components:

1. threat (perceived sensitivity and severity)
2. perceived benefits
3. perceived barriers
4. efficacy

This model has been widely used in explaining and predicting hygienic behavior, including behavior related to nutrition [17, 18]. Therefore, the present research aimed at studying the knowledge, beliefs, and behaviors of the students of a military medical university in terms their nutritional behavior in 2012.

Methodology

This is a cross-sectional study on 242 subjects, all military medical students, aged 18-32, who were selected through a stratified random sampling method. Using the prevalence formula and presuming Z=1.96, P=0.5 and d=0.07, the sample size was determined to be 196 students. Considering a possible 10% reduction, the sample size was increased to 216 students, and at the end 242 questionnaire were analyzed [19]. Data were collected from the subjects after they confirmed their conscious consent to do so. The questionnaire included demographic features (age, marital status, field of study, faculty and level of study), 11 knowledge questions, 28 questions regarding HBM constructs (5 efficacy, 8 perceived benefits, 10 perceived barriers and 5 perceived threat questions) as well as 20 performance questions. IN order to determine the validity of the questionnaire content, it was studied by 10 specialists of hygiene education, social medicine, nutrition, nursing and epidemiology, whose critical opinions were taken into consideration for improving the questionnaire content. Also, in order to determine the reliability and internal consistence of the questionnaire, it was filled out by another 30 students of a similar situation to that of the subjects, and the Cronbach's alpha coefficients were calculated for the different parts of the questionnaire, which turned out to be 0.718-0.79, a statistically acceptable value (Table 1).

Table 1) Cronbach's Alphas of the Questionnaire for Knowledge, HBM Constructs and Performance

Cronbach's alpha for 30 subjects	
Knowledge	0.79
Perceived benefits	0.72
Perceived barriers	0.786
Perceived threat	0.783
Efficacy	0.728
Performance	0.718

The questionnaire was filled out by Ph.D., Bachelor's and Associate Degree students of the Iran's Armed Forces University of Medical Sciences, which consists of three faculties: medicine, para-clinical studies and nursing. The subjects completed the questionnaire independently and the whole population was checked. The HBM constructs were put in the attitude section and included efficacy,

perceived benefits, perceived barriers, perceived threat (combining the severity and sensitivity), but the cues to action construct was not considered and interpreted in the study.

The scores of different parts of the questionnaire were calculated so that the scores of knowledge, HBM constructs and performance were classified into three levels: weak (less than 50%), average (51%-75%) and good (76%-100%). The data were analyzed using the SPSS version 15. A T-Test, ANOVA and other complementary tests, such as the Duncan test, were used to determine the correlation between the variables. The significance level was considered to be $P<0.05$ in this study.

Results

This study was carried out on 242 students, aged 18-32, of medical sciences, including medicine, dentistry, radiology, operating theater skills, health information and technology, medical emergencies and laboratory sciences of the faculties of medicine, paraclinical studies and nursing. These students were studying for an associate degree, Bachelor's degree or a Ph.D. The statistical description of the students is given in Table 2.

As regards the assessment of the students' awareness of the HBM constructs (efficacy and perceived benefits, barriers and threat), Table 3 shows that there is a significant difference between the values for these variables.

Figure 1 depicts the different levels (poor, moderate and desirable) of the students' knowledge, HBM constructs and nutrition performance. The results reveal that more than half of the students had a moderate knowledge while more than one third of them had a desirable knowledge. For more than half of the students, the efficacy and perceived barriers were at a desirable level while the perceived threat was mostly moderate. Most of the students had a desirable amount of perceived benefits and a moderate performance.

Based on the results of the ANOVA test applied to the married and single students, as shown in Table 4, the level of students' knowledge and HBM constructs were not significant while the performance was ($P=0.001$), which reveals that there was a significant difference between married and single students in terms of their food consumption pattern.

Based on the ANOVA test results for different faculties, depicted in Table 5, the level of knowledge was significant while the HBM constructs and performance were not. The complementary Duncan test results revealed that there was a significant correlation between the knowledge of medicine, paraclinical and nursing students ($P=0.017$), but there was no significant difference in terms of HBM constructs and performance.

The ANOVA test results for different degrees (levels of education), presented in Table 6, point to a significant knowledge but insignificant HBM constructs and performance. This means that there was a significant difference between the knowledge of the students studying for different degree levels, The Duncan test results further reveled that there was a significant difference between the undergraduate and postgraduate students' knowledge ($P=0.04$). Also, as far as this test is concerned, there was a significant difference between the associate degree and Ph.D students in terms of their perceived benefits ($P=0.055$). No significant difference was found in other HBM constructs. Similarly, based on the Duncan test results, no significant difference was found in terms of performance.

Discussion

The aim of this research project was to study the knowledge, beliefs and behavior of a military medical university students regarding their food consumption. The results of the study suggest that the students' levels of knowledge, performance and perceived threat were moderate while the levels of the perceived barriers, benefits and efficacy were desirable for most students. These findings suggest that these students' beliefs regarding the food consumption patterns were desirable, but their performance and perceived threat were not as good as their beliefs. This might be due to the fact that the subjects were still too young to perceive the threat of chronic diseases, such as cardiac problems or cancer and are thus less careful about their consumption. There is a good agreement between the results of this study and those of the previous ones. In Daluryanzadeh et al.'s study (2011), the majority of the subjects had a moderate knowledge (59.5%), good attitude (55.2%) and moderate performance (55.5%), which goes with the results of the present research [20]. In Ali Mohammadi's research (2010) on the students of

Mashad University of Medical Sciences, 25.3% of the students turned out to have poor, 61.3% moderate and 13.4% desirable knowledge of their food consumption behavior [21]. Farivar's study on the population of a few financially deprived provinces showed that while most of the people had a good knowledge and attitude, they rarely consumed meat, ate too much sugar and their nutrition behavior did not follow recommended levels. These findings, too, were close to those of this study [22]. Similar results were achieved in the studies done by Xie et al. (1997) and Tan et al. (2009) in China [23, 24]. Trent's work (1992), entitled "Knowledge of active- duty navy personnel," studying 2983 subjects using a knowledge questionnaire with 40 True/False items, also revealed that the soldiers' mean score was 26.1 (65%), which was a moderate value while the older soldiers and the more educated ones had a high knowledge of nutrition [25]. In Peerkhan et al.'s research project (2010), which studied the knowledge, attitudes and performance of a population of sportsmen, most of them tuned out to have a good knowledge of their nutrition, which does not agree with our study in terms of its mean knowledge level value. This could be due to the sportsmen's special attention to their food consumption behavior to reach their sports championship goals [26]. Our results are also in agreement with those of Nourmohammadi's study on physicians and students of medicine in terms of knowledge and performance but not the HBM constructs [27]. Our findings also do not agree with those of Akhavan-Attar's work on girls in terms of their knowledge, attitudes and performance [28]. These disagreements might be due to the difference in the areas, subjects and times of the studies.The married students seemed to have a better nutrition pattern than that of the single students. The students of different degree levels and fields of study were also different in terms of their knowledge of food consumption, with the Ph.D. students and students of medicine enjoying a better knowledge of nutrition. It seems that more knowledge should be provided for the students at lower levels of education as well

Table 2) Number and Percentage of the Subjects in Terms of Faculty, Degree Level, Filed of Study and Marital status

		Number	Percentage
Degree level	Medical Doctorate	82	33.9
	Bachelor's degree	136	56.2
	Associate degree	24	9.9
Faculty	Medicine	82	33.9
	Nursing	20	9.9
	Paraclinical studies	140	56.2
Field of study	Medicine	69	28.5
	Nursing	20	8.3
	Dental Prosthesis	12	5
	Anesthetics	16	6.6
	Pharmacology	6	2.5
	Dentistry	7	2.9
	Radiology	28	11.6
	Operation Theater	16	6.6
	Health Technology and Information	11	4.5
	Medical emergencies	23	9.5
	Laboratory sciences	34	14
Marital status	Married	9	3.8
	Single	231	96.3

as the students of paraclinical studies and nursing and proper provisions should be made for providing these students with environmental and behavioral education to gain a better performance in consumption. Our

findings also confirms those of Pirooznia, who argues that nutritional knowledge is not the only factor affecting the nutritional performance of people, but rather there are other factors such as physiological needs, people's self-image, access to foodstuff, the media, eating preferences and friends' performance, that can influence people's food consumption performance [29]. Sometimes, factors such as friends' eating preferences, lack of access to good food or attractive food packaging, influence food consumption behaviors [30]. Studies on people's food consumption preferences and sample size and using an HBM are two merits of this study but the small student population and lack of intervention were two limitations of the study.

The findings of this study were presented to the subjects and the control group at the end. The good

threat of diseases arising from improper nutrition was lower than beliefs.

Conclusion

The results of this research show that while the the effects of environmental factors on consumption behavior are recommended.

students' knowledge and performance are moderate, their beliefs regarding the nutritional pattern including perceived benefits and barriers as well as efficacy could be desirable, which means there is no relationship between people's knowledge, performance and beliefs in this regard. The perceived

Table 3) Comparison of Mean and Standard Deviation of Knowledge, HBM Constructs (efficacy, perceived benefits, barriers and threat) and Performance of Students in Food Consumption

Factor	Mean	Standard deviation	t	Significance
	6.92	1.43	61.25	0.000
	4.45	1.44	57.93	0.000
	7.34	1.09	117.89	0.000
	5.52	1.9	61.61	0.000
	2.98	1.22	60	0.000
	9.19	2.46	65.44	0.000

Table 4) Comparison of the Mean and Standard Deviation of Knowledge, HBM Constructs, and Performance of the Students Based on Their Marital Status

Factor	Married		Single		t	Significance
	Mean	Standard deviation	Mean	Standard deviation		
Knowledge	2.67	0.5	2.26	0.576	4.354	0.038
Efficacy	2.44	0.527	2.5	0.667	0.071	0.79
Perceived benefits	2.78	0.441	2.86	0.375	0.376	0.54
Perceived barriers	1.89	0.782	2.41	0.711	4.522	0.034
Perceived threat	2.25	0.707	2.33	0.595	0.125	0.724
Performance	1.44	0.527	1.95	0.45	10.923	0.001

Table 5) Comparison of the Mean and Standard Deviation of Knowledge, HBM Constructs, and Performance of the Students Based on their Faculties

Factor	Faculty of Medicine		Faculty of Paraclinical Studies		Faculty of Nursing		f	Significance
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation		
Knowledge	2.43	0.522	2.21	0.585	2.15	0.671	4.142	0.017
Efficacy	2.45	0.74	2.52	0.631	2.55	0.605	0.324	0.723
Perceived benefits	2.8	0.399	2.89	0.355	2.8	0.41	1.628	0.199
Perceived barriers	2.46	0.725	2.34	0.718	2.5	0.688	0.947	0.389
Perceived threat	2.28	0.597	2.32	0.607	2.5	0.513	1.053	0.35
Performance	1.95	0.542	1.91	0.407	2	0.459	0.39	0.677

Table 6) Comparison of the Mean and Standard Deviation of Knowledge, HBM Constructs, and Performance of the Students Based on Their Degree Levels

| Factor	Associate degree		Bachelor's degree		Doctorate		f	Significance
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation		
Knowledge	2.17	0.565	2.22	0.601	2.41	0.522	3.262	0.04
Efficacy	2.67	0.565	2.5	0.635	2.45	0.74	1.024	0.361
Perceived benefits	3	0	2.78	0.389	1.8	0.399	2.937	0.055
Perceived barriers	2.33	0.702	2.37	0.719	2.44	0.725	0.301	0.741
Perceived threat	2.43	0.59	2.34	0.6	2.28	0.597	0.806	0.448
Performance	2	0.295	1.91	0.43	1.95	0.542	0.475	0.623
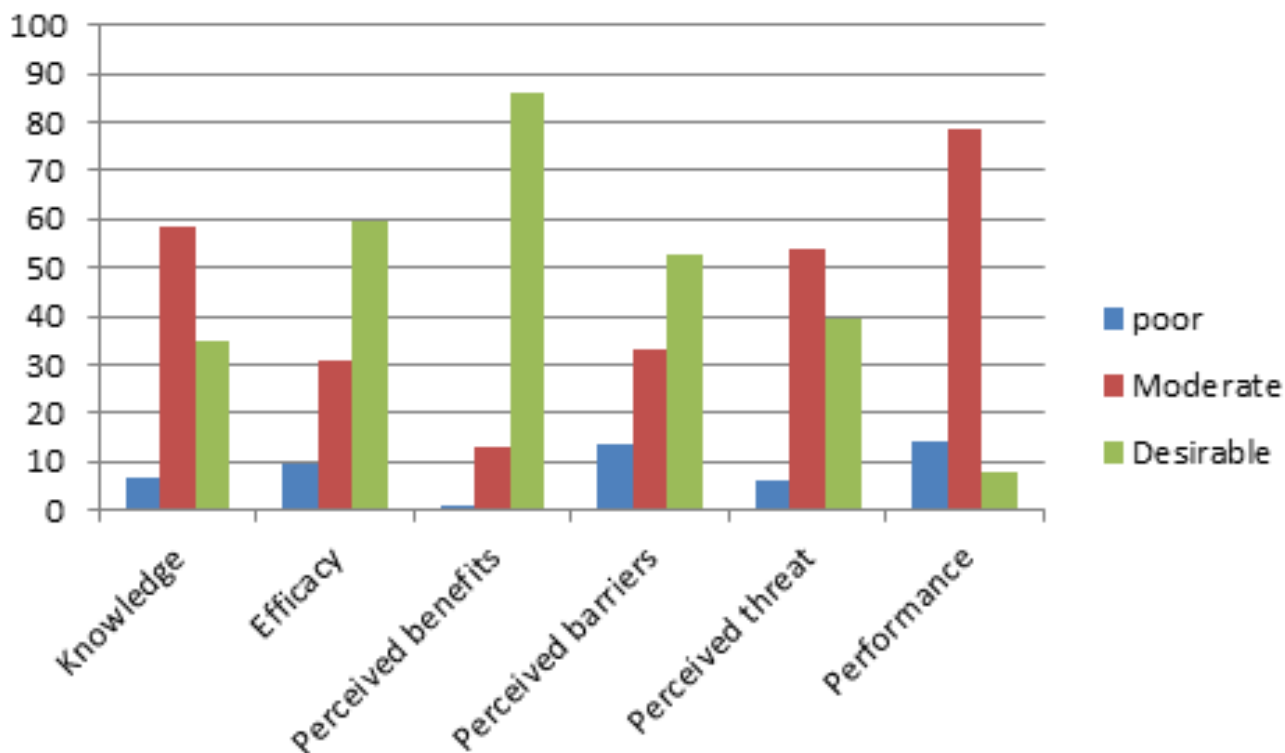
Figure 1) Levels of Mean Knowledge, HBM Constructs and Performance of Students

References

1-Taslimi Taleghani M, Djazayery A, Keshavarz SA, Sadrzadeh Yeganeh H, Rahimi A. Effect of socio- economic status on the efficacy of nutrition education in promoting the nutritional knowldage, attitude and practice in first-grade guidance school girls in Tehran. Tehran Univ Med J. 2005; 63(1): 77-82. [Persian]

2-Pena R, Quintanilla M, Navarro K, Martinez J, Castillo V, Perez W, et al. From "among girl friends" to "among mothers"-baseline research adjusts a health promoting intervention in Nicaragua. Am J Health Promot. 2007;21(4): 78-83.

3- Gupta G, Kochar K. Role Of Nutrition Education In Improving The Nutritional Awareness Among Adolescent. Internet J Nutr Wellness. 2009; 7(1).

4-Turconi G, Guarcello M, Maccarini L, Cignoli F, Setti S, Bazzano R, et al. Eating habits and behaviors, physical activity, nutritional and food safety knowldage and beliefs in an adolescent Italian population. J Am Coll Nutr. 2008; 27(1): 31-34.

5 – Paknahad Z, Sharifi rad G, Yazdani M, Hosseini S. Effect of nutrition education on knowledge and attitudes of city high school students in the academic year 86-1385, J Health Res, Spring 2010;6(1): 73-78. [Persian]

6- Musaiger AO, Al-Hazzaa HM.Prevalence and risk factors associated with nutrition-related non-communicable diseases in the Eastern Mediterranean region. Int J Gen Med. 2012;5:199-217.

7 - Aulikki N, Ximena B, Pekka P. Community-based non-communicable disease interventions: Lessons From developed Countries for developing ones. Bulletin of the world Health organization 2001; 79: 963-970

8- Abedi P, Lee MH, Kandiah M, Yassin Z, Shojaeezade D, Hosseini M,et al.Diet intervention to improve cardiovascular risk factors among Iranian postmenopausal women.Nutr Res Pract. 2010 December; 4(6): 522–527.

9-Stefańiska E, Ostrowska L, Sajewicz J. Assessment of dietary habits in students of the Medical University of Bialystok with differentiated nutritional status]. Rocz Panstw Zakl Hig. 2011;62(2):187-92. [Article in Polish]

10-Raza S, Sheikh M A, Hussain MF, Siddiqui SE, Muhammad R, Aziz S, et al .Dietary modification, body mass index (BMI), blood pressure (BP) and cardiovascular risk in medical students of a government medical college of Karachi. J Pak Med

Assoc. 2010 Nov;60(11):970-4.

11-Mirmiran P, Azadbakht L, Azizi F. Dietary behaviour of Tehranian adolescents does not accord with their nutritional knowledge. Public Health Nutr. 2007 Sep;10(9):897-901.

12-Azizi F,Azadbakht L,Mirmiran P,Momenan AA. Knowledge ,Attitude and practice of secondary and high school students region 13 of Tehran regarding healthy diet. Iranian J Endocrin Metab.2003. 5(4):409-416. [Persian]

13 - Tavakoli H, Mostafavi I, Rabbi S, Samadi M. Evaluation of BMI, triglyceride, cholesterol and blood pressure in the Basij Personnel. Third Congress of Military Medicine 2006; 74-75. [Persian]

14 - Akbari A. The role of nutrition in preventing chronic diseases. Iranian Nutrition Congress. Iran Univ Med Sci. 2006; 10-12. [Persian]

15 – Saeedi A, bachshian R. 372 military and civilian population of patients with myocardial infarction admitted in hospitals or rest. (Aj). J Military Med. 2005; 6 (2): 117-122. [Persian]

16- Tavafian SS, Hasani L, Aghamolaei T, Zare Sh, Gregory D. Prediction of breast self-examination in a sample of Iranian women: an application of the Health Belief Model . BMC Womens Health. 2009; 9: 37.

17-Park DY. Utilizing the Health Belief Model to predicting female middle school students' behavioral intention of weight reduction by weight status Dong-Yean Park .Nutr Res Pract. 2011 August; 5(4): 337–348.

18- Sharifirad G, Entezari MH, Kamran A, Azadbakht L. The effectiveness of nutritional education on the knowledge of diabetic patients using the health belief model .J Res Med Sci. 2009 Jan-Feb; 14(1): 1–6.

19- Fallahzadeh H. Sample size estimation for continuous, ordinal and the binary experimental and analytical studies. Quarterly Journal of Public Health, School of Yazd, in the ninth, second and third numbers, summer and autumn 2010 (29): 105-114. [Persian]

20– Daluryan zadeh M, Khosravi A, Razavian zadeh N, Bolbolhagigi N, Abbasids M,Tagavi N. Brrsyagahy, Attitude and Nutrition students from schools in the region, Iran: J Sci Health, spring 1390; 6 (1):19-26. [Persian]

21-Alimohammadi Kamalabadi M,Kalantari N,Abdous N,Mohammad Sadeghi SM . Residents' and interns' knowledge about nutrition in Shahid beheshti university of medical sciences. Iranian J med educ 2010; 10(1 (25)):45-54. [Persian]

22- Farivar F,Heshmat R,Azemati B,Abbaszadeh ahranjani SH,Sheykh Aleslam R,Nadim AAH,et al. Understanding knowledge , attitudes and practice towards nutrition behavior in Iranian population . Iranian J Epidemiol 2009; 5(2):11-18.

23-Xie B, Zhao X, Wu Q, Su Y. Survey on nutritional knowledge، attitude and practice among the resident in Beijing Guangzhou and Shanghai. Wei Sheng Yan Jiu .1997;26(5):343-8.

24-Tan C, Luo JY, Wang Z, Mou JS, Zhang LL, Fu Ch, et al. Knowledge, attitude, practice and related determinants on nutrition among caregivers of rural stranded children under 7-year-olds in China. Zhonghua Liu Xing Bing Xue Za zhi. 2009;30(6):588-91.

25-Trent LK. Nutrition .sensitivity . J Am Diet Assoc. 1992; 92: 724-8.

26- Peerkan Nazni, Srinivasan Vimala. Nutrition Knowledge, Attitude and Practice of College Sportsmen1.Asian J Sports Med, June 2010; 1(2): 93-100.

27-Nourmohamadi E, Goharabadi MH. Nutrition knowledge, attitudes and practices of physicians and medical students. Journal of Ghazvin University of Medical Sciences 2001;(19):68-80. [Persian].

28-Akhavan-Attar Z. Surveying the nutritional knowledge, attitude and practice of guidance school girls in district 12, in Tehran and some related affecting factors, in the academic year 1998 [dissertation]. Tehran: Health Faculty, Tehran University of Medical Sciences;1998. [Persian]

29-Pirouznia M. The correlation between nutrition knowldage and eating behavior in an American school: The role of ethnicity. Nutr Health .2000; 14(2): 89-107.

30-Esfar Jani F, Golestan B, Rasouli B, Roustaei R, Derakhshani K. Surveying the efficacy of education on nutritional knowledge and performance of adolescent girls. Pajouhandeh 2004;9(1(37)):21-29. [Persian]