ORIGINAL ARTICLE

Investigation of Predictors of Dairy Consumption in Students of Shahr-e Kord University of Medical Sciences: An Application of the Health Belief Model

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ABSTRACT

Introduction: Balanced nutrition and the use of dairy products, because of their nutrients, is one of the basic pillars of health and can be effective in increasing educational efficiency. The present study aimed to determine predictors of dairy consumption in students of Shahr-e Kord University of Medical Sciences using the health belief model. **Methods:** The present research was a descriptive-analytical study which was conducted on 351 students of Shahr-e Kord University of Medical Sciences in 2017. The participants were selected using cluster sampling. The required data were collected through a three-part questionnaire (demographic variables, constructs of the Health Belief Model, and items related to the dairy consumption behavior) and then statistically analyzed using descriptive statistics and analytical tests (Pearson correlation and regression analysis) in SPSS-18. **Results:** The results showed that 45.9% of male students and only 12.7% of females used dairy products every day ($p<0.000$). Except for perceived benefits, there was no significant difference between male and female students in the mean score of other constructs ($p<0.05$). The results of multiple regression analysis indicated that perceived susceptibility in male students and perceived self-efficacy in female students are the main predictors of dairy consumption behavior. **Conclusions:** Based on the study findings, perceived susceptibility and perceived self-efficacy, as the most important predictors of dairy consumption behavior in university students, should be emphasized in the development of training interventions.

Keywords: Behavior, Dairy, Student, Self- Efficacy, University

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INTRODUCTION

A large part of the Iranian population is made up of youth (1). The youth are among those who are often learning and preparing for social life and, as a result, they are more exposed to high-risk behaviors (2). A high percentage of these young people are university students (1).

Identification of the nutritional status of different groups is very important, especially students of medical sciences who will play a major role in changing health behavior of people in their future career (2). Diet and nutrition play a very important role in human life and health from birth to death. Irregular diet and fear of obesity, inappropriate body shape, and failure to get an appropriate position among peers lead to changes in food intake patterns and inadequate intake of nutrients among university students. On the other hand, the tendency of young people to go on weight loss regimens for having a proper body shape and their low nutritional knowledge in this area have caused them to eliminate some beneficial nutrients from their daily diet, such as dairy products, whereas it has been recommended to use at least 3-4 shares of dairy products every day (4). Daily consumption of milk provides 65-72% of the body calcium requirement in adults (4). Milk and its products are among the most important food items and are very close to a perfect food. In addition, they are rich in nutrients essential for life such as high-quality proteins, calcium, and essential minerals that are important for growth and resistance to infectious diseases and diseases caused by malnutrition (4).

Models and theories are guidelines for health education and health promotion activities. Theories can help planners to find answers to questions such as why people do not have the desirable behavior, how behaviors should be changed, and what factors should be considered in the evaluation of programs (5).

In this study, the health belief model was selected as the reference framework. Glanz et al. believe that the dimensions of the health belief model could be useful in understanding health behaviors in multicultural groups

(6). The HBM structure, including perceived susceptibility (person's subjective perception of the danger of obtaining an illness or disease), perceived severity (person's feelings on the importance of constricting an illness or disease), perceived benefits (person's perception of the effectiveness of different actions available to decrease the danger of illness or disease), perceived barriers (person's feelings on the difficulties to accomplishment a suggested health action.) and perceived self-efficacy (person's assurance in his or her capability to successfully perform a performance) (6).

This model can be also effective in the design of short-term disease prevention and behavior change programs (7). The health belief model is a comprehensive model that plays a major role in preventing diseases. Based on this model, one's decision and motivation to adopt a health behavior are related to three factors including personal perception, moderating behaviors, and the likelihood of that behavior (7).

Individual Perception, There are factors that affects on understanding illness, it is also a consequence of a health behavior. Likelihood of Action, explains about Factors affecting the likelihood of adopting appropriate behavior.The probability of adopting a health behavior depends on two things: one's perception of the level of danger threatening them and their assessment of the benefits and barriers of the health behavior. In addition, the probability of adopting a health-promoting behavior is influenced by intermediary factors such as demographic characteristics (age, gender, and race), psychosocial factors (individual characteristics, social class, and peers), and structural factors (information about the disease) (7).

On the other hand, nutritional attitudes and beliefs are important factors in predicting nutritional behaviors. In addition, the level of awareness, beliefs, and cognitive factors about nutrition are substantially associated with nutritional behaviors, as nutritional awareness is one of the factors affecting nutritional habits of individuals and their family and friends (8). Studies of Karimi et al. (9) and Mayenhan et al. (10) showed that nutritional attitudes and beliefs are important factors in predicting nutritional behaviors. Considering the importance of youth and student life and the necessity of dairy products consumption, the present study aims to determine predictors of dairy consumption in students of Shahr-e Kord University of Medical Sciences using the health belief model.

MATERIALS AND METHODS

Study design and population

The present research was a descriptive-analytical study which was conducted on 351 students of Shahr-e Kord University of Medical Sciences in 2017. Cluster sampling method was used with university's schools taken as clustering units. Samples were selected randomly using table of random numbers. 5 schools of the university were randomly selected based on calculation of the minimum need clusters needed from the sample size and average number of students per cluster. Efforts were made to design the study such that the students are illustrative of the study population. Voluntary written consent were obtained from students for voluntary participation in each stage of the study. Those unwilling to participate in the study, lacking proper physical conditions to answer questions, and absence or transfer to other educational centers were excluded from the study

Ethical considerations

After the approval of the research project at the Student Research Committee of Shahr-e Kord University of Medical Sciences and obtaining a letter of introduction, the authors visited faculties of Health, Nursing, Medicine, and Paramedicine. The university officials were briefed on the research objective and procedure and they were asked to allow the authors to enter the classrooms in order to select the participants and distribution of research questionnaires among them. The participants were also briefed on the research and they were asked to spend enough time on the Completion of questionnaires and answer the questions with complete honesty. In addition, they were assured that their personal information will be kept confidentially and anonymously. Research proposal approved with a code of ethics of IR.SKUMS.REC.1395.165.

Questionnaire

The data gathering tool in this research was a Researcher made questionnaire; the first part deals with demographic variables (age, gender, educational level, place of residence, parental occupation, and parental educational attainment) and the second part measures the attitude of participants using constructs of the health belief model, including perceived susceptibility (4 items), perceived severity (4 items), perceived benefits (6 items), perceived barriers (4 items), and perceived self-efficacy (4 items). The items were scored based on a 5-point Likert scale (quite agree:4, agree:3, no comment:2, disagree:1, and quite disagree:0). The mean score was considered from 100 and by dividing the total number of items in each structure by the highest score in that structure multiplied by the total number of substances in that structure and then multiplied by 100.

In order to measure the validity and reliability of the questionnaire the following stages were completed: to assess the face validity of the questionnaire, a complete list of substances was given to a group of 30 students with the alike demographical, economic and social characteristics to the goal population. Their ideas were applied in the questionnaire. In qualitative assessment of the content validity, 5 experts in health education and 2 experts in nutrition were asked to check the perception and reporting of the statements. The

reliability was assessed by internal consistency method and it was α=0.81 for perceived susceptibility, α=0.75 for perceived severity, α=0.79 for perceived benefits, α=0.80 for perceived barriers and α=0.83 for perceived self-efficacy.

In this study, in order to assess the consumption of dairy, questionnaire which includes Milk, yogurt, Cheese, Curd and Ice cream was used. Students were asked to report the: Do they use dairy during the week? The yes answers scored one and the answer of "no", got scored zero.

Statistical analysis

The obtained data were statistically analyzed using descriptive statistics and analytical tests (Pearson correlation and regression analysis) in SPSS-18. For data analysis, dairy consumption behavior was considered the dependent variables and constructs of the health belief model (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and perceived self-efficacy) and demographic variable were regarded as independent variables. The significance level in this study was determined to be less than 5%.

RESULTS

In this study, 351 students from Shahr-e Kord University of Medical Sciences were selected as the sample. The results showed that 44.2% of participants aged 18-20 years and 79.5% of them were a bachelor student. In terms of gender, 58.4% of participants were female and 41.6% of them were male. Based on the results, 34.6% of participants had a father with an academic degree and 26.2% of them had a mother with a high school diploma. About parental occupation, 37% of fathers were self-employed and 79.8% of mothers were a housewife. In addition, 62.7% of them expressed that they have breakfast every day.

The mean score of constructs of the health belief model indicated that there is a significant difference between male and female students (Table I). The results of independent t-test showed that there is a significant difference between male and female students in daily consumption of dairy products (p<0.000), as 45.9% of male students and only 12.7% of females used dairy products every day.

The results also showed that 9.3% female students and 15.8% male students used dairy products every day, 13.7% female students and 19.2% male students used dairy products every other day, 20% female students and 18.5% male students used dairy products every two days, and 36.1 % female students and 34.9% male students used dairy products once a week. In addition, 21% female students and 11.6% male students used milk and dairy products at all. 87.3% of females and 54.1% of males did not daily consumption of dairy products (Table II).

Table I: Mean and standard deviation of the health belief model constructs in university students by gender

Variable	Mean ± SD		
	Females	Males	Test result
Perceived susceptibility	69.15±12.32	76.63 16.05	P<0.001
Perceived severity	55.21±12.59	67.85±17.96	P<0.001
Perceived benefits	95.63±16.15	93.49±20.73	P=0.431
Perceived barriers	71.55±18.31	55.44±24.48	P<0.001
Perceived self-efficacy	67.19±19.13	62.28±15.50	P=0.027

Pearson correlation coefficient showed that there is a good correlation between constructs of the health belief model. Perceived susceptibility had a direct relationship with perceived severity, perceived benefits, and perceived self-efficacy and an inverse relationship with perceived barriers. In addition, there was a direct relationship between perceived benefits and perceived barriers and an inverse relationship between perceived severity and perceived barriers.

Table II: Daily consumption of dairy products in the participants by gender

Daily consumption of dairy products	Number (percentage)		
	Females	Males	Test result
Yes	26(12.7)	67(45.9)	000.0 > p
No	179(87.3)	79(54.1)	

On the other hand, perceived self-efficacy had a direct relationship with other constructs of the health belief model. In addition, dairy consumption behavior presented a direct relationship with perceived susceptibility, perceived severity, and perceived self-efficacy but an inverse relationship with perceived barriers (Table III).

The results of linear regression demonstrated that all constructs of the health belief model predict 22.4% and 21.2% of dairy consumption behavior in male and female university students, respectively. The results of regression analysis also showed that perceived susceptibility and perceived self-efficacy are the main predictors of dairy consumption behavior in male and female students, respectively (Table IV).

DISCUSSION

The present research aimed to study the determinants of dairy consumption in university students using the health belief model. The results showed that the mean score of perceived susceptibility and perceived severity was significantly higher in male students, while the mean score of perceived barriers and perceived self-efficacy was higher in female students. In overall, mean scores suggested the favorable attitude of students towards

Table III: The matrix of correlation between constructs of the health belief model and dairy consumption behavior

	Perceived susceptibility	Perceived severity	Perceived benefits	Perceived barriers	Perceived self-efficacy	Behavior
Perceived susceptibility	1					
Perceived severity	**0.406	1				
Perceived benefits	**0.347	0.053	1			
Perceived barriers	-0.132	**-0.383	*0.159	1		
Perceived self-efficacy	**0.207	*0.007	**0.307	*0.158	1	
Behavior	**0.299	**0.241	0.078	*-0.156	**0.185	1

* P < 0.05; ** P < 0.001

Table IV: Regression analysis of predictors of adopting dairy consumption behavior based on the health belief model

Groups	Variables	Line slope (β)	t	Significance level	Coefficient of determination (R^2)
Males	Perceived susceptibility	0.278	2.75	0.007*	0.224
	Perceived severity	0.013	0.130	0.897	
	Perceived benefits	-.004	-0.050	0.961	
	Perceived barriers	-0.132	-1.508	0.134	
	Perceived self-efficacy	0.057	0.688	0.493	
Females	Perceived susceptibility	0.01	0.129	0.897	0.212
	Perceived severity	-0.031	-0.462	0.644	
	Perceived benefits	0.048	0.568	0.571	
	Perceived barriers	0.101	1.419	0.157	
	Perceived self-efficacy	0.259	3.385	0.001*	

dairy consumption. In a study conducted by Dini et al., it was reported that the attitude was favorable in one-third of students, self-efficacy and perceived barriers were in a favorable level in more than half of the students, perceived threats was in a moderate level in most of them, and perceived benefits was in a satisfactory level in the majority of students (11). Baghiani Moghaddam et al. showed that only 13.8% of the participants had a good attitude towards the consumption of milk and dairy products (4). Chen et al. reported that the attitude of participants towards dairy consumption was good (12), while the findings of Ai Zhao et al. indicated that the participants had an undesirable attitude towards dairy consumption (13).

The study findings demonstrated that perceived susceptibility had a direct relationship with perceived severity, perceived benefits, and perceived self-efficacy and an inverse relationship with perceived barriers. It seems that individuals who are more susceptible to being at risk of affliction with a disease or condition are more likely to believe in the costs and the family, economic, and social consequences of diseases. In addition, the more they view themselves at risk, the higher their belief in benefits of adopting health-promoting behaviors to avoid the problems and negative consequences of the disease. They will be also more confident in their ability to perform healthy behaviors.

The results indicated that there was a direct relationship between perceived benefits and perceived barriers and an inverse relationship between perceived severity and perceived barriers. On the other hand, perceived self-efficacy had a direct relationship with other constructs of the health belief model. In addition, dairy consumption behavior presented a direct relationship with perceived susceptibility, perceived severity, and perceived self-efficacy but an inverse relationship with perceived barriers.

The results of this study showed that 45.9% of male students and only 12.7% of females had the habit of daily consumption of dairy products. The findings of Momennasab et al. (14) indicated that 40.7% and 16.1% of university students, respectively, had not consumed milk and other dairy products at all within one week before the study. Ebadifard et al. (15) also reported that the dairy consumption was not in an acceptable status among the participants, whereas Chen et al. (12) reported a desirable level of dairy consumption. Several factors are involved in reducing dairy consumption, including low awareness of the benefits of dairy consumption The role of parents, Competitive drinks, False beliefs and attitudes about the importance of dairy, The taste of milk and The price of dairy

The results of linear regression demonstrated that all constructs of the health belief model predict 22.4% and 21.2% of dairy consumption behavior in male and female university students, respectively. This correlation confirms the assumptions in this model and its validity in predicting dairy consumption. The results of regression

analysis also showed that perceived susceptibility and perceived self-efficacy are the main predictors of dairy consumption behavior in male and female students, respectively. Self-efficacy is one of the effective and most important predictors of health-promoting behaviors (16). Some researchers believe that self-efficacy provides the possibility of predicting some behaviors. Defined as one's belief in one's ability to succeed in specific situations or to accomplish a task (17), self-efficacy can enable a person to adopt health-promoting behaviors and quit harmful behaviors. Hence, understanding of self-efficacy can help to maintain and improve health-promoting behaviors. In fact, self-efficacy is a major factor in changing behavior (18) and an important prerequisite for behavior, which affects one's motivation and makes them to consistently pursue a behavior (19). Therefore, it plays an important role in developing effective methods for designing training interventions and programs. Health-related behaviors are influenced by social norms, culture, mass media, national health policies, advertising practices, and physical and social environments (19). As a result, the diversity of the social and cultural situation in the country, on the one hand, and different status of health indicators of in different regions, on the other hand, require the local and regional assessment of health needs, so that appropriate training can be provided to empower individuals.

Based on a general rule, people show an appropriate response to health messages and preventive measures when they feel they are at serious risk (19-21). Actually, if there is proper knowledge about the factors affecting human health behaviors, better strategies and methods can be developed to realize the health education goals and the success indicators will be chosen in a more logical way (22). Based on the study findings, perceived susceptibility is considered a proper predictor of adopting health-promoting behaviors.

It is noteworthy that inappropriate nutritional behaviors sometimes are due to lack of access to healthy foods or attractive packaging and color of unhealthy foods. Therefore, it is necessary to improve the appearance and organoleptic attraction of healthy food in order to increase the frequency of their consumption. In this regard, cooperation health officials and practitioners to prepare healthy foods and increase their availability. However, the influence of friends and peers should not be ignored (23).

Given the share of dairy products in providing protein and many micronutrients required for the body, there is a need for emphasis on and proposal of appropriate recommendations and solutions to increase the share of this group of foods in the food basket of families. In addition, theoretical and purposeful training programs can be developed in order to increase awareness and create a positive attitude towards the importance of milk consumption, aiming at preventing the devastating and annoying effects of osteoporosis and protein deficiency in the next generation (24).Also, according to the predictive power of health belief model constructs, more studies will be conducted to identify other Predictors of dairy consumption, It is recommended to use heath education and promotion theories and models to improve these actions. Also, it is recommended that the study be carried out in other age groups of students. It is extremely suggested to conduct educational strategies in schools due to their significant roles for correcting the capability of conformity healthy life style.

One of the strengths of this study was the use of the health belief model for the prediction of dairy consumption. The use of a self-report questionnaire was one of the limitations of the present research, because the answers may be affected by recall bias.

CONCLUSION

Based on the study findings, perceived susceptibility and perceived self-efficacy, as the most important predictors of dairy consumption behavior in university students, should be emphasized in the development of training interventions.

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