



## Effective Factors of the Healthy Nutritional Behavior Based on the Application of Social Cognitive Theory among 13-15-Year-Old Students

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### Abstract

**Background:** There is a rapid spurt in non-communicable diseases because of some significant changes in nutrition patterns around the globe. Controlling the main risk factors, namely lack of physical activity and smoking, might decrease more than 50% of the deaths and disabilities caused by these factors. This study aimed to investigate the effective factors of healthy food behavior based on the application cognitive social theory to 13 to 15-year- old students.

**Materials and Methods:** This cross-sectional study was performed on 330 students aged 13–15 years, in Zarrin- Dasht County, Fars Province, south of Iran who were randomly selected from public schools assigned to the study in 2016. The data gathering tools were demographic questionnaire, a researcher-made questionnaire of social cognitive theory (outcome expectations, outcome values, self-efficacy, social support, and self-regulation), and another questionnaire on nutritional behavior. Questionnaires were completed by students. For analyzing data, the SPSS-22 software, multiple regression, and correlation tests were used.

**Results:** 330 students aged 13–15 years with seventh, eighth and ninth educational grade participated in this study. Among different constructs of social cognitive theory, outcome expectations ( $P=0.001$ ), social support ( $P=0.005$ ), and self-regulation ( $P=0.001$ ), have made significant contribution to the explanation of the variance of appropriate nutritional behavior among the students. In total, these variables account for approximately 63% of the variance of nutritional behaviors.

### Conclusion

According to the results of this study outcome expectations, social support, and self-regulation might be effective in designing educational interventions to achieve healthy food behavior in students.

**Key Words:** Behavior, Nutrition, Social Theory, Student.

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## 1- INTRODUCTION

In recent years, improving the quality of healthcare services and widespread coverage of immunization, along with rapid changes in lifestyle, has led to a change in the pattern of illnesses; there has been a reduction in communicable diseases and a rapid increase in non-epidemic diseases. This trend is threatening developing countries more than their developed counterparts (1). Findings from various studies show that 77% of deaths, and 85% of diseases in low-income countries can be attributed to non-communicable diseases (1, 2). According to the World Health Organization (WHO), the mortality rate due to these diseases in developing countries is expected to increase the age of disability from 7.43% in 1999 to 8.9% in 2020 based on one's life duration (1). According to research, the reason for this increase could be the development of significant changes in nutrition patterns, physical activity, and smoking throughout the world (3).

In general, the risk factors for non-contagious diseases are divided into modifiable and non-modifiable categories. Smoking and alcohol intake, lack of physical inactivity, inappropriate diet, and stress are considered modifiable factors or behavioral risk factors (4). By controlling these risk factors, it is possible to reduce over 50% of deaths and disabilities caused by these diseases (5). Several studies have been conducted on the direct relationship between childhood/adolescent behavior and adulthood habits as well as their interrelationships with non-contagious diseases. Many studies have shown the impact of adolescent nutrition on adulthood nutritional and eating habits (6). Nutritional behavior is a multi-cause health-related issue with important health implications (7). Obesity is regarded as the epidemic of diseases correlated with an unhealthy lifestyle. The avoidance of inactivity could prevent obesity and its

relevant issues (8). One of the most effective theories used to predict and express nutritional behaviors is Albert Bandura's social cognitive theory (9), which emphasizes that individual and environmental characteristics affect behavior; this theory believes in the two-way conflicts of personality, behavior, and environment (10). Social cognitive theory, while expressing predictive factors and effective principles in behavior formation, offers solutions to changing the behavior (11). In the study of Karim Shahanjarini et al., the constructs of this theory predicted 21% of the variances of consumption of ready food in women (12). In the study of Sadr Hashemi et al., self-efficacy was a predictor of breakfast consumption (13).

In the study of Jalili et al., social cognitive theory to determine factors predicting nutritional behaviors in pregnant women visiting health centers in Tabriz was used (14). In the study of Landis et al., which aimed to determine the role of social support, knowledge, and self-efficacy as factors related to the prevention of osteoporosis in girls, the correlation coefficient between self-efficacy and consumption of calcium-containing food has been reported to be 0.269 (15). Zarrin Dasht County (Fars province, Iran) based on social cognitive theory constructs.

## 2- MATERIALS AND METHODS

### 2-1. Study Design and Population

This cross sectional descriptive analytical study was conducted on students in Zarrin Dasht County, Fars province, Iran. The study population includes seventh to ninth grade students.

### 2-2. Method

The current study was conducted on 330 students aged 13 to 15 years old in Zarrin Dasht County. The schools were randomly selected from public schools in accordance with the sample size: two male and two female middle schools were chosen in

Zarrin Dasht County, Fars province (South of Iran) in 2016. Each school consisted of three classes (one seventh grade, one eighth grade, and one ninth grade), and each contained approximately 30 students. This study included 330 students aged 13 to 15 based on the inclusion criteria with a test power of 95% and a Type 1 error of 5%, with  $d=1$ ,  $\sigma^2=86$ . This sample size was calculated by means of the sample volume formula for estimation of qualitative variable in cross-sectional studies. The data was collected through the interviews and self-reporting questionnaires. Sample size estimation was based on the following formula:

$$n = \frac{Z^2 (1 - \frac{\alpha}{2}) \sigma^2}{d^2}$$

### 2-3. Inclusion Criteria

The inclusion criteria were the age between 13 and 15, the absence of any acute and chronic physical as well as psychological illnesses, and the completion of informed consent by students and their parents.

### 2-4. Exclusion Criteria

The exclusion criteria were discontinuation of participation in the study by the participants, the inability to respond to the questions, and having severe illness.

### 2-5. Measuring tools

The data gathering tools in this study consisted of three-part questionnaire: the first part of the questionnaire was the demographic questionnaire and included questions about gender, educational grade, father's occupation, mother's occupation, parents' housing situation, and history of cardiovascular disease in the family. The second part of the questionnaire was the researcher-made questionnaire according to social cognitive theory constructs, and was derived from a questionnaire by

Deborah L. Dewar et al. (2012) by applying some changes and nutritional behavior questionnaire, the validity and reliability of which were measured (16). Social cognitive theory constructs included seven questions about outcome expectations (e.g. "Can healthy nutritional behaviors help me to control my weight?") with the answers of "completely agree" to "completely disagree", and the total score could be from a minimum of 7 to the maximum of 35. Seven questions related to outcome expectations (e.g. "Is it important for me to control my weight?") had the answers of "completely important" to "completely unimportant", and the total score could vary from a minimum of 7 to the maximum of 35.

Seven questions related to self-efficacy questions (e.g. "I'm sure I can eat dairy every day") were framed with the answers of "completely agree" to "completely disagree", with the total score ranging from a minimum of 7 to the maximum of 35. Ten questions related to social support (e.g. "My family prepare and provide healthy homemade food") were framed with the answers of "never" to "always", with the total score varying from a minimum of 10 to the maximum of 50. As many as six questions were related to self-regulation constructs (e.g. "I plan and I try to have a healthy diet plan") with the answers of "never" to "always", with the total score ranging from a minimum of 6 to the maximum of 30.

The third part of the questionnaire was the nutritional behavior questions. Nine questions were related to nutritional behavior that varied from two to three options, and the participants were asked to choose an option for each question (e.g. "How many vegetables do you consume daily?"). The social cognitive theory questionnaire was approved through the establishment of a panel of health education and promotion experts and assessed by Content Validity Ratio (CVR)

and Content Validity Index (CVI). In the initial review, the CVR index for all instruments above was 0.8 and the CVI for all scales was more than 0.9. Structural validity was also verified through confirmatory factor analysis. The selected references were suitable useful to evaluate any concept, while the constructive questions relating to any concept had a desirable and significant load factor. To measure the reliability of the questionnaire in a preliminary study, Cronbach's alpha coefficient was examined while 30 students were interviewed. The internal correlation for each of the cognitive social theory constructs was higher than 0.7.

### 2-6. Ethical Considerations

This study was approved by the Ethics Committee of Tehran University of Medical Sciences (ID number: IR.TUMS.REC.1394.1184), and before the implementation of this research the objectives of the study were sufficiently explained to participants and they were assured of the confidentiality of their individual information in the study.

### 2-7. Data Analyses

SPSS software version 22.0 was used for data analysis. In order to describe baseline characteristics, descriptive statistics including frequency and percentage, mean and standard deviation (SD) were used. In order to determine the effect of each independent variable (outcome expectations, outcome expectancies, self-efficacy, social support and self-regulation) on the dependent variable (nutritional behaviors), multiple linear regression tests, Pearson correlation were used. In order to determine normality of variables Kolmogorov-Smirnov test was used. The significance level of  $P < 0.05$  was selected.

## 3- RESULTS

The present study aimed to investigate the effective factors of healthy nutritional

behavior in students aged 13 to 15 years in Zarrin Dasht County based on social cognitive theory constructs. 330 students aged 13 to 15 years from public schools currently studying in seventh schools in seventh, eighth and ninth educational grade participated in this study. The baseline characteristics studied in this research were gender, educational grade, father's occupation, mother's occupation, parents' housing situation, and history of cardiovascular disease in the family (**Table.1**).

As is shown, half of the students were girls. The study population included seventh (34.24%) to ninth (33%) grade students. Their mothers were mostly housewives (87.6%), and fathers were mostly self-employed (75.5%). Most students lived with their parents; 2.4% of the students had a history of cardiovascular disease in their families. There was no significant relationship between demographic variables and social cognitive theory constructs ( $P > 0.05$ ). **Table.2** shows that the obtained scores from cognitive social theory constructs and nutritional behaviors and the minimum and maximum score that the students could achieve.

**Table.3** revealed that approximately 63% of variances in the nutritional behavior are explained by independent variables. Regarding the values of F (108.844), and  $p$ -value  $< 0.01$ , it can be concluded that the sum of these variables can explain the changes in nutritional behavior.

According to **Table.4**, the "outcome expectations, social support, and self-regulation" constructs influence nutritional behavior as all of them have significant effects on nutritional behavior at the 5% error levels and 95% confidence. The effects of these three constructs on nutritional behavior are increasing in such a way that any increase in any of them individually would increase in each of them would increase the desirability of nutritional behavior. However, the two

constructs of "outcome expectancies and self-efficacy" have no significant effect on nutritional behavior. It should be noted that the independent variable of the "self-regulation" construct has the greatest effect on nutritional behavior. The beta

coefficient of self-regulation (0.320) means that for each unit increase in the standard deviation of self-regulation, the desirability of nutritional behavior increased 0.320 units, so that, the change is direct and incremental.

**Table-1:** Frequency distribution of baseline characteristics of participants in the study

Variables	Frequency	Percentage	P- value
<b>Gender</b>			
Female	165	50	P>0.05
Male	165	50	
<b>Educational grade</b>			
Seventh	113	34.24	P>0.05
Eighth	108	32.72	
Ninth	109	33	
<b>Father's Occupation</b>			
Office worker	45	13.6	P>0.05
Retired	7	2.1	
Worker	22	6.7	
Self-employed	249	75.5	
Jobless	7	2.1	
<b>Mother's Occupation</b>			
Housewife	289	87.6	P>0.05
Working at home	11	3.3	
Working outside home	30	9.1	
<b>Parents' Housing Situation</b>			
Owner	304	92.1	P>0.05
Rented	26	7.9	
<b>History of cardiovascular disease in the family</b>			
Yes	8	2.4	P>0.05
No	322	97.6	

**Table-2:** The mean, standard deviation and achievable score range from the cognitive social theory constructs and nutritional behavior

Variables	Mean	Standard deviation	Assignable score range
Outcome expectations	22.63	2.05	7-35
Outcome expectancies	27.01	1.83	7-35
Self-efficacy	20.37	2.19	7-35
Social Support	26.15	2.63	10-50
Self-regulation	13.31	2.04	6-30
Nutritional Behavior	15.90	1.19	9-23

**Table-3:** Regression analysis statistics of the effect of independent variables on nutritional behavior

Index	R	R <sup>2</sup>	Adj R <sup>2</sup>	F	P-value
Value	0.792	0.627	0.621	108.844	0.001

R: Correlation coefficient; R<sup>2</sup>: Coefficient of determination; Adj R<sup>2</sup>: Adjusted R square, a modified version of R-squared, adjusted for the number of predictors in the model.



**Table-4:** Evaluation of the extent and direction of the effect of independent variables on nutritional behavior

Variable	B	Std. Error	Beta	t	P- value
Constant	8.957	1.414	-	6.338	0.001
Outcome expectations	0.198	0.052	0.273	3.816	0.001
Outcome expectancies	0.081	0.063	0.067	1.282	0.201
Self-efficacy	0.071	0.045	0.110	1.576	0.116
Social Support	0.102	0.036	0.196	2.844	0.005
Self-regulation	0.191	0.045	0.320	4.263	0.001

#### 4- DISCUSSION

In the current study the "outcome expectations, social support, and self-regulation" constructs influence nutritional behavior and the two constructs of "outcome expectancies and self-efficacy" have no significant effect on nutritional behavior. The "self-regulation" construct has the greatest effect on nutritional behavior. The results of this study showed that there are problems in the adolescence nutritional behavior, which is a very important period in life. Based on the results, social cognitive theory can explain about 63% of the variance of nutritional behavior in students through the studied independent variables including outcome expectations, outcome values, self-efficacy, social support, and self-regulation.

##### 4-1. Self-regulation construct

In the study of Guillaumie et al., self-regulation constructs behave as the best predictors of nutritional behavior among adolescent students. There was a positive and significant relationship between self-regulation and nutritional behavior (17). In the study of Rezaei et al., there is a significantly positive correlation between self-regulation and dietary habits (18). The study of social cognitive constructs used in social cognitive theory shows that among cognitive constructs, self-regulation is more effective than other factors in predicting nutritional behavior. Considering the effects of inappropriate nutritional behavior on the health of adolescents, it is necessary to design and

implement educational programs to modify their food habits and behavior to create appropriate behavior.

##### 4-2. Outcome expectations and expectancies constructs

Based on the study results, the outcome expectancies do not show any significant relationship with nutritional behavior. In this study, outcome expectations are significantly correlated with proper nutritional behavior. The results of Najimi et al. show no significant correlation between fruits and vegetable consumption and outcome expectations (19). It seems that by considering the age group of students and their outcome expectations for fruits and vegetables consumption on individual health, the social support sources in this study (parents and teachers) do not have a significant role in the consumption of fruits and vegetables by students. This necessitates the examination of other sources of social support, including peers and the media

##### 4-3. Social support construct

The social dimension of social cognitive theory is social support. According to the results of this study, social support shows a significant relationship with nutritional behavior. In their study, Baranowski et al. show that parental support for giving children access to fruits and vegetables is one of the most important predictors of consumption (20, 21). In his research, Abedini et al. conclude that the education and support of pregnant mothers for adequate food intake is necessary,

especially in working groups and low-income families (22). In many cases, the role of parents and peers as a motivator is considered for similar behavior in students. Some studies suggest that parents can influence their children's dietary habits (23). Pearson's systematic study finds that encouraging parents to be a positive role model by focusing on increasing the consumption of fruits and vegetables can have an effective and appropriate effect on children's nutritional behavior (24).

#### 4-4. Self-efficacy construct

In this study, self-efficacy of students in relation to their nutritional behavior was investigated. The results do not show any significant correlation between self-efficacy and nutritional behavior. Self-efficacy indicates a person's confidence in the ability to perform the behavior (25). In some studies, increasing self-efficacy leads to a change in nutritional behavior (26). Other studies express self-efficacy as one of the most important components of social cognitive theory in promoting the consumption of fruits and vegetables (27). In the study of Najmi et al., where self-efficacy constructs are placed in difficult situations, self-efficacy in the selection of fruits and vegetables and their availability has been reported as predictive variables in students (19).

#### 4-5. Nutritional behavior

The moderate level of healthy dietary behavior in the study is indicative of unhealthy nutritional behavior by students. These results confirm the results from previous studies that show that only 10% of children and adolescents respond fully to the recommendations by the nutrition centers (28). In the study of the healthy heart in Isfahan, Kelishadi et al. reported the consumption of fruits and vegetables was below 1 share per day (29). Bashour's study of Syria also shows that only 2.5% and 11% of students consume fruits and vegetables based on the recommendations

by nutrition experts (30). However, other studies have suggested that nutritional quality decreases gradually as adolescence age increases—hence, the consumption of fruits, vegetables, and juices declines in the late adolescence period than earlier, while the use of beverages and sugar increases (31).

#### 4-6. Limitations of the study

As with other studies, this study has some limitations including the use of the self-report method in assessing the nutritional performance of students, even though it was conducted under full supervision of researchers and colleagues. The recognition and use of more objective methods are required in future studies. The other limitation was the long and time consuming questionnaire with limited student free time for completing it.

### 5- CONCLUSION

Based on the results, social cognitive theory can explain about 63% of the variance of nutritional behavior in students through the studied independent variables. It seems that health education interventions based on the application of social cognitive theory can be helpful to increase healthy nutritional behavior. The results of this study identify the outcome expectations, social support, and self-regulation as the main determinant factors in nutrition education programs for students aged 13 to 15 years. By designing and implementing educational interventions based on these factors, it is possible to reduce the problems caused by unhealthy nutritional behavior and improper food patterns in this demographic group.

**6- CONFLICT OF INTEREST:** None.

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