

## Evaluating the Relationship between Dietary Pattern and Dietary Self-Efficacy in Teenage Girl Students

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### ABSTRACT

**Background & aim:** Dietary patterns have dramatically changed in all age groups, especially the teenagers in the Iranian population. It was needed to identify the prevalence of dietary patterns and its determinants in this age group. Health behavior is one factor that influence dietary patterns and self-efficacy is a strong factor for behavior improvement. Therefore, the aim of this study was to measure the relationship between dietary patterns and the status of self-efficacy induced dietary behaviors in teenage girl students.

**Methods:** This cross-sectional study was conducted on a total of 236 teenage girl students selected by cluster random sampling method in Mashhad, Iran, in 2016. Frequency food questionnaire and self-efficacy questionnaire were used to evaluate dietary patterns and dietary self-efficacy of each participant. Data analysis was performed using SPSS software (version 16) with unpaired t-test, Chi-square or Fisher's exact test.

**Results:** The prevalence of unhealthy dietary patterns was obtained as 65.3%. Overall levels of high, moderate, and low self-efficacy were 35.8%, 56.9%, and 7.3%, respectively. The mean score of dietary self-efficacy was higher in the group with healthy dietary patterns, compared to the group with unhealthy dietary patterns (14.12±4.25 Vs 13.88±4.71 respectively); however, the difference was not statistically significant (P>0.05).

**Conclusion:** Considering the high rate of unhealthy dietary patterns and undesirable status of dietary self-efficacy of teenagers, special attention of policymakers is needed for promotion of healthy dietary patterns and dietary self-efficacy in teenagers. It is recommended to carry out experimental studies to identify the effect of dietary self-efficacy on dietary patterns.

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## Introduction

Lifestyle and dietary habits have dramatically changed in the Iranian population in the last 20 years. This revolution was associated with an increased prevalence of overweight and obesity in all age groups, especially teenagers. However, this revolution is a complex problem around the World (1). Unhealthy diet in childhood is related to obesity

development, type 2 diabetes, cancer, and other chronic diseases later in the lifetime (2-4). Adolescence is the most important period of life that can guarantee the health or disease during the lifetime (5).

The teenage group is 20% of the total population worldwide 85% of which live in developing countries (6). Therefore, it can be

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said that teenage girls are approximately 10% of the total population in the world. Moreover, sufficient nutrition is very important for this age group as future mothers (7). The characteristics of physical and social environments are effective in forming nutritional behaviors in children and adolescents. The teenagers are more interested in eating foods of higher availability irrespective of the effects of socioeconomic and cultural factors on food choices. In addition, food structure is an important factor in the formation of dietary patterns (8).

The present nutritional behaviors in teenage girls (as future mothers) affect their present and future health in addition to the influences on having healthy children and families in the future (9-14). According to the results of some studies, it was shown that the increase in the level of health problems in the community in developing countries is related to poverty and lack of awareness regarding healthy principles among girls (14-17). Based on the findings of a study in Iran it was reported that unhealthy dietary behaviors are common among Iranian children (18). Demographic characteristics (i.e., age, sex, race, and socioeconomic status [SES]) as important factors are associated with dietary intake and dietary pattern in children (19). Although, self-efficacy is a major factor to form a healthy dietary pattern it can be said that it has strong effects on food choices (20).

The results of some studies about self-efficacy revealed that people with no self-confidence about their abilities to perform a particular behavior cannot perform it or unlikely perform it, that is contrary to the individuals who are self-confident. The increase of self-efficacy may be induced by self-confidence and may be a good predictor to perform healthy behaviors in people. Sometimes, self-efficacy explains more than 50% of behavior variations. Lifestyles and dietary habits play important role in the teenager's health. Overall, shaping the behaviors in an individual refers to the nutritional behaviors of the family and availability of healthy food, as well as nutritional behaviors that are associated with dietary self-efficacy (21-24).

The results of some studies show that dietary self-efficacy is a mediator between

favorite foods and food choices and dietary patterns (25, 26). Based on the evidence it was revealed that self-efficacy is an important factor to increase efficacy in nutritional education programs and change dietary patterns. Furthermore, self-efficacy induced behaviors correlate with dietary intake (27, 28). Although the results of the aforementioned studies suggested that dietary self-efficacy affects food choices, they provide limited information about the association between dietary self-efficacy and common dietary patterns. Consequently, this study aimed to evaluate the prevalence of unhealthy dietary patterns and dietary self-efficacy and the related association in teenage girl students.

## Materials and Methods

The present study was a cross-sectional study conducted on 236 female high school students in Mashhad, Iran, in 2016. The sample size was determined based on a similar study investigating the status of nutrition and self-efficacy (29) using a power of 80% and an *alpha* error of 5%. After obtaining the permission of education officials in Mashhad the study was conducted in April 2016. According to cluster random sampling method, separate clusters were considered based on district no. 6 in Mashhad from which one cluster was randomly selected.

There were six high schools in this cluster from each school one class was chosen. Finally, a total of 250 subjects (age range: 13-15 years) were selected using the mentioned sampling method. The written consent forms were obtained from students' parents for participation. The inclusion criteria were all girls within the age range of 13-15 years present at school at the time of sampling. Moreover, students with dietary disorders, dietary restraints, or particular diets were excluded from the present study.

The nutritional status was evaluated using a standard questionnaire, namely FFQ (Feed Frequency Questionnaire). It is a valid and reliable self-report food frequency questionnaire with the validity (correlation coefficients) and reliability (intra-class correlation coefficients) ranged from 0.49%-0.82% and 0.66%-0.89% for all foods, respectively (30) to evaluate dietary

intake and determine average consumption and the frequency of 148 food items during the last month.

Two healthy and unhealthy dietary patterns were identified based on the previous studies (31) The unhealthy group has high consumption of mayonnaise, refined cereals, French fries, non-refined cereals, high-fat dairy, organ meats, as well as red or processed meats, and the healthy group has high consumption of vegetables, legumes, potatoes, fruit and fruit juices, liquid oils and olive oil, fish, low-fat dairy and poultry meat (31). A valid and reliable questionnaire was utilized for the assessment of self-efficacy (Cronbach's alpha coefficient: 0.8%) (32). In this study, the validity of the self-efficacy questionnaire was approved by ten health education professors.

Self-efficacy questionnaire included 6-item Likert scale items (very low, low, moderate, high, and very high) scored from 0-4. The total score obtained in the three groups were reported as more than 66.7% (high self-efficacy), 33.4%-

66.6% (moderate self-efficacy), and less than 33.3% (low self-efficacy) (33). In addition, for the determination of reliability, self-efficacy questionnaire and FFQ were given to 27 students prior to the study rendering Cronbach's alpha coefficients of 0.88% and 0.7% for self-efficacy questionnaire and FFQ, respectively.

After data collection, all the analyses were performed using SPSS software (version 16) and the normality of data was checked using Kolmogorov-Smirnov test. All the obtained data were reported as mean and standard deviation compared between the two groups by the unpaired t-test. Categorical variables were compared using Chi-square test or Fisher's exact test. P-value was statistically considered significant for all the tests (P=0.05).

## Results

A total of 236 teenage girls were recruited in this study with demographic characteristics summarized in Table 1.

**Table 1.** Demographic characteristics of teenage girl students

Variable	Describe	
Mother's age (M±SD)	39.20±6.47	R (28-66)
Father's age (M±SD)	43.20±6.96	R (29-73)
Family size (M±SD)	4.64±1.34	R (1-11)
Birth rank (n (%))	1-2	147 (69%)
	3-4	56 (26.2%)
	5-7	10 (4.7%)
Father's education (n (%))	Elementary	109 (47.6 %)
	Junior high school	73 (31.9%)
	High school diploma	39 (17%)
	College educated	8 (3.5%)
Mother's education (n (%))	Elementary	126 (54.3%)
	Junior high school	65 (28%)
	High school diploma	38 (16.4%)
	College educated	3 (1.3%)
Father's occupation (n (%))	Employee	14 (6.2%)
	Worker	89 (39.4%)
	Self-employed	86 (38.2%)
	Others	33 (15%)
Mother's occupation (n (%))	Employee	6 (2.6%)
	Worker	12 (5.2%)
	Self-employed	10 (4.4%)
	Housewife	198 (86.5%)
Family income (n (%)) (Million Toman)	Others	3 (1.3%)
	<0.5	112 (49.1%)
	0.5-1	82 (36%)
	1-2	28 (12.3%)
	>2	6 (2.6%)

The prevalence of unhealthy dietary patterns was reported as 65.3% in teenage girls. Moreover, high, moderate, and low levels of self-efficacy were 35.8%, 56.9%, and 7.3%. Furthermore, the distribution of dietary self-efficacy score was normal and mean score of dietary self-efficacy was 13.96±4.55 ranged

from 0-24. There was no significant difference between maternal age and birth rank between the groups with healthy and unhealthy dietary patterns (P>0.05). However, a statistically significant difference was observed in paternal age and family size between the two dietary patterns (P<0.05) (Table 2).

**Table 2.** Comparison of students' characterizes between groups with healthy dietary patterns and unhealthy dietary patterns

Variable	Dietary pattern	(Mean±Standard deviation)	P-value
Father's age	Healthy	44±6.53	0.045*
	Unhealthy	42.79±7.16	
Mother's age	Healthy	39.12±6	0.917*
	Unhealthy	39.24±6.73	
Family size	Healthy	4.92±1.4	0.012*
	Unhealthy	4.5±1.3	
Birth rank	Healthy	2.11±1.26	0.906*
	Unhealthy	2.07±1.25	
Self-efficacy	Healthy	14.12±4.25	0.69 **
	Unhealthy	13.88±4.71	

\*Mann-Whitney U Test, \*\*T-test

Dietary pattern correlated with paternal (P=0.031) and maternal (P=0.047) educational level, as well as father's (P=0.004) and mother's (P=0.012) occupations. Although there was no association between the educational level of parents and dietary patterns (father,  $\chi^2=4.098$ , P=0.251 and mother,  $\chi^2=1.74$ , P=0.627). In addition, no relations were observed between paternal occupation and dietary patterns ( $\chi^2=0.589$ , P=0.905), as well as the level of family income and dietary patterns (F=4.490, P=0.210). Only maternal profession significantly correlated with dietary patterns (F=8.16, p=0.05).

dietary patterns and dietary self-efficacy (P=0.005), and dietary self-efficacy score was higher in the group with healthy dietary patterns, compared to the group with unhealthy dietary patterns. Nonetheless, there was no significant relationship between the levels of dietary self-efficacy (high self-efficacy, moderate self-efficacy, and low self-efficacy) and dietary patterns ( $\chi^2=1.130$ , P=0.568). Self-efficacy score was analyzed as a dependent variable and the obtained results revealed that the mean difference of dietary self-efficacy score was not statistically significant in the parental level of education (P>0.05).

Moreover, there was an association between

**Table 3.** Dietary self-efficacy and socioeconomic status in students

	Medium and Mediator range of self-efficacy sig score			Mean±Standard deviation of self-efficacy sig score			
<b>Father's education</b>	Elementary	14 (4.7)	* $\chi^2=1.67$ P=0.64	Father's occupation	Employee	17.1±4.01	**F=3.62 P=0.01
	Junior high school	13 (7)			Worker	13.88±4.26	
	High school diploma	14 (5)			Self-employed	13.53±4.67	
	College educated	14 (6)			Others	13.09±4.91	
<b>Mother's education</b>	Elementary	13(6.5)	$\chi^2=1.56$ P=0.67	Mother's occupation	Housewife	13.73±4.57	***t=1.57 P=0.13 t=1.147 P=0.257
	Junior high school	15 (8)			Employee	15.14±4.80	
	High school diploma	14 (4)		Household income	< one million Toman	14.08±4.58	
	College educated	14 (8.25)			> one million Toman	13.11±4.54	

\*Kruskal-Wallis test, \*\*One-way analysis of variance, \*\*\*T-test

Furthermore, the mean difference of dietary self-efficacy score was statistically significant in the different classes of father's occupation ( $P=0.01$ ); however, this difference was not significant in the different classes of mother's occupation ( $P=0.13$ ) (Table 3). The results of pairwise comparison using the Tukey's test showed significant differences in the self-efficacy scores between an employee with a worker ( $P=0.01$ ), an employee with self-employed ( $P=0.03$ ), and an employee with other professions ( $P=0.01$ ). The findings of the linear model did not demonstrate any associations between parents' age and dietary self-efficacy score ( $P>0.05$ ).

## Discussion

The purpose of this study was to determine the prevalence of unhealthy or healthy dietary patterns and calculate dietary self-efficacy in teenage girls. The prevalence of unhealthy dietary patterns was reported as 65.3%. In addition, it can be said there is a high prevalence of unhealthy nutrition among teenage girls that is consistent with the results of other studies (7, 31, 34, 35). Overall, the dominant dietary pattern was the unhealthy dietary pattern among Iranian girl adolescents (31) which can be a predictor of increasing risk of noncommunicable diseases.

The obtained results indicated that the mean scores of paternal age and family size were higher in the group with healthy dietary patterns that is in line with the findings of a similar study (7); however, maternal age did not affect the selection of healthy dietary patterns. In most of the studies, limited attention has been paid to the impact of paternal age on the choice of dietary patterns in students (17). In the present study, no association was observed between the level of literacy and parents' professions in the group with healthy dietary patterns. In this regard, there were no reported correlations in a similar study (36).

The findings of other comparable studies have revealed a relationship between the increase of household income and unhealthy food consumption (37). Although in another study it was indicated that higher costs are associated with healthy diets that could be a barrier against healthy dietary patterns, especially among people

with lower socioeconomic status (38, 39). Nonetheless, in this study, no significant association was observed between the level of household income and dietary patterns because household income was approximately homogenous in participants ( $97.4 < 2$  million Tomans).

Overall, some studies have reported various correlations between dietary patterns and socioeconomic factors (40). In a study, low SES correlated with healthy dietary patterns (41). Contrary to the results of some other studies an association was observed between high SES and unhealthy dietary patterns due to high energy intake and high consumption of cholesterol or saturated fatty acid (unhealthy dietary pattern) (42). The obtained results of this study indicated that dietary self-efficacy score was higher in the group with healthy dietary patterns, compared to that of the group with unhealthy dietary patterns. However, the difference was not statistically significant and the level of dietary self-efficacy score was reported moderate in the majority of the participants (56.9%).

Moreover, the findings of similar studies were consistent regarding moderate self-efficacy in teenagers (16, 21). There are several factors for the determination of dietary self-efficacy in adolescents, such as socio-biological, environmental, and parental support (43). As dietary self-efficacy score was different in the level of SES, only the difference was statistically significant in different levels of father's occupation. This finding indicated that the teenagers with higher dietary self-efficacy score had parents with higher social status. Overall, parents with higher social class can enhance dietary self-efficacy score and provide access to healthy dietary patterns for their children (44).

Moreover, other finding revealed that dietary self-efficacy score was lower in high-level household income and it was higher in low-level household income; however, the difference was not statistically significant in the two groups ( $P>0.05$ ). Although the results of previous studies emphasized the role of dietary self-efficacy and family characteristics in choosing dietary patterns (19, 22).

No significant correlation was observed between socioeconomic level and dietary self-

efficacy score. Only father's profession had a significant association with dietary self-efficacy score. Overall, it can be concluded that literacy and parent's profession were important factors that influence the selection of dietary pattern and dietary self-efficacy based on the homogeneity of household income level. The limitations of the present study included the retrospective nature and students' reports about SES of the family that may be incorrect (because they did not have sufficient information).

### Conclusion

Dietary pattern was considered unhealthy and dietary self-efficacy status was undesirable in students that can be associated with the increasing level of metabolic syndrome in adulthood. In addition, special attention was required to provide students of low socioeconomic levels with healthy dietary patterns. Furthermore, it was needed to increase the sensitivity of health policymakers and community programs for the promotion of healthy dietary patterns and dietary self-efficacy in students. It is recommended to carry out experimental studies for the identification of dietary self-efficacy effects on dietary patterns.

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### Conflicts of interest

The authors declare no conflicts of interest.

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