

## Original Article

# The Correlation between Family Function and Health-promoting Lifestyle among Female Adolescents in Iran

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### ABSTRACT

**Background:** Health-promoting lifestyle (HPL) is a major health concern among adolescents. Family function (FF) has potential effects on adolescents' lifestyle and health. **Objectives:** This study aimed to evaluate the correlation between FF and HPL among female adolescents. **Methods:** This correlational study was conducted from January to February 2020 on 356 female adolescent students randomly recruited through multistage cluster sampling from four public junior high schools in the south of Tehran, Iran in 2020. Data were collected using a personal characteristics questionnaire, the Adolescent Health Promotion Short Form, and the McMaster Family Assessment Device. Data analysis was performed through Pearson's correlation coefficient, the one-way analysis of variance, the independent-samples *t* test, and the linear regression analysis. **Results:** The average age of adolescents was  $14.16 \pm 0.76$  years. The total mean scores of participants' HPL and FF were  $75.36 \pm 12.43$  (in the possible range of 21–105) and  $3.02 \pm 0.37$  (in the possible range of 1–4), respectively. There was a significant positive correlation between FF and HPL ( $r = 0.399$ ,  $P < 0.001$ ). Among demographic characteristics, adequacy of family income, and among dimensions, the problem-solving, behavioral control, roles, and affective involvement dimensions of FF were significant predictors of HPL, explaining 24.5% of its total variance. **Conclusion:** The mean HPL and FF were greater than the possible median scores. Also, adequacy of family income and FF were significant predictors of HPL among female adolescents. Healthcare authorities and policymakers are recommended to pay greater attention to FF in developing health-promoting programs for adolescents.

**KEYWORDS:** Adolescent, Family function, Health-promoting lifestyle

## INTRODUCTION

Adolescents constitute around one-sixth of the global population.<sup>[1]</sup> The national census in Iran also revealed that there were 12 million adolescents aged 10–19 years in Iran in 2016.<sup>[2]</sup> Adolescence is associated with rapid physical and emotional changes and transition from childhood to adulthood.<sup>[3]</sup> It is the period of forming attitudes and behaviors and thereby, determines lifestyle behaviors in adulthood.<sup>[4]</sup>

Lifestyle is one of the main factors affecting health in all stages of life. Health-promoting lifestyle (HPL) is considered as the main factor in the prevention of

most health-related problems. It consists of six main dimensions, namely nutrition, physical activity, health responsibility, stress management, social support, and life appreciation.<sup>[5]</sup> Most adolescents have an unhealthy lifestyle and are at risk for developing unhealthy lifestyle behaviors such as immobility, unhealthy

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eating, cigarette smoking, and alcohol consumption. These behaviors can negatively affect their physical and mental health in adulthood, and thereby negatively affect family and public health.<sup>[6-8]</sup>

The term “family” is a societal construct whereby persons are related by ancestry, marriage, adoption, or choice. The adolescents spend more time at family and set family members as role models, then, family is strongly linked to their health and wellbeing.<sup>[9,10]</sup> Family functioning is one of the factors with potential effects on adolescents’ HPL. Good family function (FF) can promote the formation of healthy behaviors. FF is the ability of a family to meet the needs of its members by mutual love and support, emotional communication, and sharing life events and stress.<sup>[11,12]</sup>

The McMaster Model of FF (MMFF) is one of the most well-known FF-related models. This model focuses on those aspects of FF that have the greatest effects on the physical and emotional health or problems of family members.<sup>[13]</sup> MMFF states that FF has the following seven main dimensions: problem-solving, communication, roles, affective responsiveness, affective involvement, behavior control, and general functioning.<sup>[14]</sup>

In families with good FF, individuals have distinct roles, clear relationships, and good effects on each other and can achieve success through the successful performance of their activities. Contrarily, families with poor functioning are disorganized and have weak relational patterns and weak relationships.<sup>[15]</sup> A study showed that problems in families can be the main cause of failure in social relationships and high-risk behaviors such as alcohol consumption and drug abuse.<sup>[16]</sup> Accordingly, some studies have compared the health-promoting behaviors and the FF, which shows that this comparison differs in various areas, and some dimensions of HPL are neglected. Fleming Megan’s study showed that FF had significant relationships with some lifestyle behaviors such as physical activity and fruit and vegetable consumption among adolescents.<sup>[17]</sup> Several other studies also showed that FF had a significant relationship with health-related problems in adolescence such as emotional-behavioral problems,<sup>[18]</sup> anorexia nervosa,<sup>[19]</sup> anxiety, and depression.<sup>[20]</sup>

Although previous studies reported that FF can be a predictor of some health-related outcomes in adolescence, there are limited data about the role of FF dimensions in adolescents’ HPL. Community health nurses, as evaluators, trainers, guides, and referrers, can communicate with families and can take effective measures to improve the level of performance and meet

the health-related needs of family members. Moreover, reviewing the literature shows lack of studies related to the relationship between family functioning and HPL. Therefore, we conducted this study to address this gap.

### Objective

This study aimed to evaluate the correlation between FF and HPL among female adolescents.

### METHODS

This correlational study was conducted from January to February 2020. The study population comprised all female adolescent students in public junior high schools in Tehran, Iran. Sampling was done through multistage cluster sampling. Initially, two districts (based on a larger population and demographically diverse) were randomly selected from all 11 districts in the south of Tehran city, and then, two junior high schools were randomly selected from each of these two districts. Three classes were selected from each of the schools through simple random sampling. All eligible students of these 12 classes were recruited for the study. In total, 360 students were assessed for eligibility. Selection criteria were an age of 13–15 years, consent for participation, and living in invulnerable families. Vulnerable families were single-parent, no-parent, step-parent, immigrant families as well as families with addicted or disabled members, and families with physically and mentally ill patients. Participants were excluded if they moved to another school or voluntarily withdrew from the study.

The sample size was determined using the sample size formula for a two-variable correlation (i.e.,  $n = [(Z_{(1-\alpha/2)} + Z_{(1-\beta)})^2 / (\omega)^2] + 3$ , where  $\ln \left[ \frac{(1+r)}{(1-r)} \right]$ ) considering the correlation coefficient of 0.15 between FF and HPL as well as a confidence level of 0.95 and a test power of 80%.<sup>[21,22]</sup> Accordingly, 346 students were determined to be necessary for the study. Considering possible attrition of 0.5%, 360 samples were recruited and finally 356 students completed the study questionnaire.

### Data collection instruments

Data were collected using a personal characteristics questionnaire, the Adolescent Health Promotion Short Form (AHP-SF), and the McMaster Family Assessment Device (FAD). The personal characteristics questionnaire consisted of 10 items on age, body mass index, last-semester grade point average, family size, birth order, adequacy of family income, and parents’ educational level and occupation.

AHP-SF was used for HPL assessment. Chen *et al.*<sup>[5]</sup> developed this scale in 2014 in Taiwan for high-school students aged 13–19 years. AHP-SF has 21 items in

six dimensions, that is, nutrition (three items), social support (four items), health responsibility (four items), life appreciation (four items), physical activity (three items), and stress management (three items). Items are scored on a 5-point scale from 1 (“Never”) to 5 (“Always”). The possible total score of this scale is 21–105, with higher scores representing a healthier lifestyle. Chen *et al.*<sup>[15]</sup> reported the acceptable validity and reliability of this scale with a Cronbach  $\alpha$  of 0.90. Sharkani *et al.*<sup>[23]</sup> reported the acceptable validity and reliability of the Persian AHP-SF with a Cronbach  $\alpha$  of 0.83 and a test–retest intraclass correlation coefficient of 0.81.

FF was assessed using FAD. Epstein *et al.*<sup>[24]</sup> developed this scale in 1983 based on MMFF. FAD has 53 items on organizational, transactional, and structural properties of families and addresses the seven dimensions of FF, namely problem-solving (five items), communication (six items), roles (eight items), affective responsiveness (six items), affective involvement (seven items), behavioral control (nine items), and general functioning (12 items). Item scoring is performed on a four-point scale from 1 (“Completely disagree”) to 4 (“Completely agree”). The total score of the scale is calculated by dividing the sum score of the items by 53 and ranges between 1 and 4. Higher scores show better FF. Epstein *et al.* reported that the Cronbach  $\alpha$  values of FAD dimensions were 0.72–0.92. Zadehmohmmadi and Malekkhosravi<sup>[25]</sup> reported the acceptable validity and reliability of the Persian FAD with a Cronbach  $\alpha$  value and the test–retest intraclass correlation coefficient of 0.90 and 0.81, respectively.

The data collection instruments were distributed among participants to complete them through self-report. The questionnaires were distributed during class time and the researcher was present and provided the participants with the necessary explanations, if needed.

### Data analysis

The Statistical Package for the Social Sciences (SPSS) software program, version 16.0 was used for data analysis. Data were described using the measures of descriptive statistics including frequency, mean and standard deviation. First, the association between the independent variable (FF and characteristics) and the dependent variable (HPL) was examined. Then the dependent variable and dependent variables were entered in the regression model. Pearson’s correlation coefficient analysis was used to determine the correlations among HPL and FF. Also, the same test was used to determine the correlations among HPL and FF and variables such as age and BMI.

One-way analysis of variance was used to determine the differences between the mean scores of HPL and FF in terms of variables such as parent’s educational level, birth rank, and adequacy of family income. The independent-samples *t* test was used to determine the difference between the mean scores of HPL and FF in terms of variables such as parents’ employment status, last-semester grade point average, and family size. The multiple linear regression analysis was used to determine which demographic characteristics and FF dimension score predict HPL. The level of significance was set at less than 0.05.

### Ethical considerations

This study has the approval of the Ethics Committee of Tehran University of Medical Sciences, Tehran, Iran (code: IR.TUMS.FNM.REC.1398.154). Necessary permissions were obtained from the authorities of the study setting. Participants and their parents were informed of their freedom to withdraw from the study and the confidentiality of their data. Written informed consent was obtained from participants and their parents.

### RESULTS

In total, 360 junior-high-school students were included and studied; of these, 356 completed the questionnaire. The mean age of the participants was  $14.16 \pm 0.76$  years. Most of them were the first child of their families (56.3%), lived in families with less than four members (77.5%), [Table 1] shows their characteristics.

The total mean scores of participants’ HPL and FF were  $75.36 \pm 12.43$  (in the possible range of 21–105) and  $3.02 \pm 0.37$  (in the possible range of 1–4), respectively [Table 2]. The results of the independent-samples *t* test and the one-way analysis of variance illustrated that the mean score of participants’ HPL had a significant relationship with the employment status of their fathers ( $P = 0.04$ ), adequacy of family income ( $P = 0.02$ ), and family size ( $P = 0.03$ ). Moreover, these tests indicated that the mean score of participants’ FF had a significant relationship with their fathers’ educational level ( $P = 0.02$ ), adequacy of family income ( $P < 0.001$ ), and last-semester grade point average ( $P = 0.02$ ) [Table 1].

The Pearson’s correlation analysis revealed that HPL had a significant positive correlation with FF ( $r = 0.399$ ,  $P < 0.02$ ). Moreover, pairwise correlations between the dimensions of HPL and the dimensions of FF were significant and positive ( $P < 0.05$ ), except for the correlation between the communication dimension of FF and the nutrition dimension of HPL and the correlation between the effective involvement

**Table 1: Participants' characteristics and their relationships with the mean scores of FF and HPL**

Characteristics	N (%)	Family function		Health-promoting lifestyle	
		Mean ± SD	P value	Mean ± SD	P value
Father's educational level					
Below diploma	159 (44.6)	3.08 ± 0.43	0.02 <sup>a</sup>	74.76 ± 12.21	0.45 <sup>a</sup>
Diploma	147 (41.4)	3.05 ± 0.5		75.38 ± 12.49	
University	50 (14)	3.27 ± 0.48		77.29 ± 12.97	
Mother's educational level					
Below diploma	143 (40.2)	3.07 ± 0.44	0.06 <sup>a</sup>	73.48 ± 12.1	0.17 <sup>a</sup>
Diploma	164 (46.1)	3.08 ± 0.48		76.33 ± 11.98	
University	49 (13.8)	3.21 ± 0.51		77.56 ± 14.26	
Father's employment status					
Employed	317 (89)	3.1 ± 0.45	0.24 <sup>b</sup>	75.81 ± 12.46	0.04 <sup>b</sup>
Unemployed	39 (11)	3.01 ± 0.61		71.65 ± 11.61	
Mother's employment status					
Employed	46 (12.9)	3.15 ± 0.48	0.41 <sup>b</sup>	74.39 ± 15.2	0.63 <sup>b</sup>
Housewife	310 (87.1)	3.09 ± 0.47		75.50 ± 11.9	
Birth rank					
First	200 (56.2)	3.11 ± 0.5	0.59 <sup>a</sup>	76.7 ± 12.65	0.06 <sup>a</sup>
Second	100 (28.1)	3.05 ± 0.43		74.14 ± 12.48	
Third or more	56 (15.7)	3.1 ± 0.46		72.74 ± 11	
Adequacy of family income					
Insufficient	28 (7.9)	2.67 ± 0.59	<0.001 <sup>a</sup>	69.24 ± 11.72	0.02 <sup>a</sup>
Relatively sufficient	112 (31.5)	3.09 ± 0.45		76.71 ± 11.78	
Sufficient	216 (60.7)	3.15 ± 0.44		75.45 ± 12.66	
Last-semester grade point average					
Very good	329 (92.4)	3.11 ± 0.46	0.02 <sup>b</sup>	75.63 ± 12.27	0.26 <sup>b</sup>
Good	27 (7.6)	2.88 ± 0.53		72.78 ± 14.92	
Family size					
Less than 4	276 (77.5)	3.12 ± 0.45	0.11 <sup>b</sup>	76.12 ± 11.88	0.03 <sup>b</sup>
More than 4	80 (22.5)	3.02 ± 0.53		72.73 ± 13.9	
Age (years): mean ± SD	14.16 ± 0.76	$r = 0.002$ ; $P = 0.96^c$		$r = 0.01$ ; $P = 0.85^c$	
Body mass index: mean ± SD	20.99 ± 3.88	$r = 0.084$ ; $P = 0.11^c$		$r = -0.045$ ; $P = 0.39^c$	

FF = family function, HPL = health-promoting lifestyle, SD = standard deviation. <sup>a</sup>The results of the one-way analysis of variance;

<sup>b</sup>The results of the independent-sample *t* test; <sup>c</sup>The results of Pearson's correlation analysis

dimension of FF and the nutrition, physical activity, and social support dimensions of HPL, which were not statistically significant ( $P > 0.05$ ; Table 2).

The multiple linear regression analysis showed that among demographic characteristics, adequacy of family income, and among dimensions of FF, the problem-solving, roles, affective involvement, and behavioral control were significant predictors of HPL and explained 24.5% of its total variance ( $R^2 = 0.245$ ) [Table 3].

## DISCUSSION

The mean score of HPL was greater than the possible median score of HPL (in the possible range of 21–105). The highest dimensional mean score was related to the life appreciation dimension, which is in agreement with the findings of a study on male adolescents in Iran<sup>[26]</sup> and a study on female and male adolescents

in Turkey.<sup>[27]</sup> The higher score of the life appreciation dimension might be attributable to the fact that adolescents gain many experiences through attending different social occasions and situations, hence have a good appreciation of life. On the contrary, the lower HPL dimensional mean score might be related to the health responsibility dimension. A study on Japanese adolescents<sup>[28]</sup> and a study on Chinese adults<sup>[29]</sup> also reported the same finding. Experience of health-related problems are facilitators for the development of health responsibility.<sup>[30]</sup> Then, the lower score of the health responsibility dimension might be linked to the adolescents' limited experience of health-related problems.

The mean score of FF in this study was greater than the possible median score of FF (in the possible range of 1–4). The highest and the lowest FF dimensional mean scores were related to the problem-solving and

**Table 2: Pairwise correlations between FF and HPL and their dimensions**

Family function	Health-promoting lifestyle							Mean $\pm$ SD
	Nutrition	Physical activity	Health responsibility	Stress management	Social support	Life appreciation	Total HPL	
Problem-solving								3.20 $\pm$ 0.54
<i>r</i>	0.218	0.275	0.295	0.341	0.149	0.364	0.411	
<i>P</i> value	<0.001	<0.001	<0.001	<0.001	0.005	<0.001	<0.001	
Communication								2.8 $\pm$ 0.47
<i>r</i>	0.024	0.117	0.115	0.214	0.157	0.181	0.208	
<i>P</i> value	0.654	0.028	0.030	<0.001	0.003	0.001	<0.001	
Roles								2.86 $\pm$ 0.42
<i>r</i>	0.193	0.211	0.236	0.284	0.154	0.283	0.340	
<i>P</i> value	<0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001	
Affective responsiveness								2.95 $\pm$ 0.56
<i>r</i>	0.193	0.121	0.202	0.316	0.143	0.235	0.300	
<i>P</i> value	<0.001	0.022	<0.001	<0.001	0.007	<0.001	<0.001	
Affective involvement								3.10 $\pm$ 0.54
<i>r</i>	0.054	0.053	0.107	0.175	0.082	0.190	0.167	
<i>P</i> value	0.313	0.315	0.044	0.001	0.122	<0.001	0.002	
Behavior control								3.08 $\pm$ 0.47
<i>r</i>	0.220	0.171	0.178	0.263	0.141	0.302	0.313	
<i>P</i> value	<0.001	0.001	0.001	<0.001	0.008	<0.001	<0.001	
General functioning								3.09 $\pm$ 0.47
<i>r</i>	0.201	0.229	0.215	0.323	0.182	0.298	0.360	
<i>P</i> value	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	
Total FF								3.02 $\pm$ 0.37
<i>r</i>	0.215	0.224	0.253	0.364	0.192	0.352	0.399	
<i>P</i> value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Mean $\pm$ SD	10.70 $\pm$ 2.23	10.33 $\pm$ 3.12	12.80 $\pm$ 3.77	10.39 $\pm$ 2.92	14.86 $\pm$ 3.33	16.25 $\pm$ 3.21	75.36 $\pm$ 12.43	

FF = family function, HPL = health-promoting lifestyle, SD = standard deviation

the communication dimensions, respectively. This is in line with the findings of a former study in Iran<sup>[20]</sup> and contradicts the findings of a study in Thailand, which showed that the highest and the lowest dimensional mean scores were related to the communication and the effective responsiveness dimensions, respectively.<sup>[31]</sup> This contradiction is attributable to the fact that FF is under the influence of sociocultural factors; hence, it varies in different countries.

The findings of this study also indicated that HPL and its dimensions had significant positive correlations with FF and its dimensions. Moreover, FF and adequacy of family income level were significant predictors of HPL. Most previous studies in this area reported the same findings. For instance, a study on 2793 adolescents in Columbia showed that FF had significant relationships with lifestyle behaviors related to weight management, nutrition, and physical activity among all racial and ethnic groups.<sup>[32]</sup> Another study reported that FF is a significant determinant of healthy behaviors among

adolescents.<sup>[17]</sup> Several other studies also showed the negative correlation between FF and some aspects of HPL.<sup>[33,34]</sup> The differences between the findings may lie in samples, cultural issues, limitations in health equipment and facilities in Iran, lack of time management, differences in the tools used, and lack of attention by people and authorities to the health of adolescents and FF.

The adequacy of family income was the only variable that showed a significant relationship with FF and HPLs. Therefore, the adequacy of family income entered the regression model and the results showed that the HPL of students with relatively sufficient income was better than those with sufficient income. This finding contradicts the findings of studies by Amiri<sup>[35]</sup> and Nacar.<sup>[36]</sup> It is clear that families with low-income have more problems in meeting the needs of family members. However, high income may also lead to family problems that affect FF.<sup>[36]</sup> Unalan *et al.*<sup>[37]</sup> in Kayseri observed no relationship between scores of the

**Table 3: The results of the multiple linear regressions for the predictors of HPL**

Variables	B	$\beta$	t	P Value	95.0% confidence interval for B	R <sup>2</sup>
Constant	29.78	–	5.43	0.000	19.01, 40.56	0.245
Problem-solving	6.14	0.27	4.45	0.000	3.42, 8.85	
Communication	–1.74	–0.06	–1.14	0.255	–4.75, 1.26	
Roles	4.35	0.15	2.13	0.033	0.34, 8.36	
Affective responsiveness	1.48	0.06	1.05	0.293	–1.28, 4.25	
Affective involvement	–3.18	–0.13	–2.12	0.035	–6.14, –0.23	
Behavioral control	3.92	0.15	2.25	0.025	0.50, 7.35	
General functioning	2.37	0.091	1.28	0.201	–1.27, 6.02	
Father's employment						
Employed	1.73	1.93	0.89	0.371	(–2.07, 5.53)	
Unemployed	Reference category					
Adequacy of family income						
Insufficient	0.59	0.013	0.251	0.802	(–4.08, 5.28)	
Relatively	2.94	0.11	2.253	0.025	(0.37, 5.52)	
Sufficient	Reference category					
Family size						
Less than 4	2.36	0.08	1.654	0.099	(–0.44, 5.18)	
More than 4	Reference category					

HPL = health-promoting lifestyle

HPLPS and financial status. However, we can conclude that the adolescent's opportunities, in a broad sense, may be limited by their parents' financial resources. So, social and economic factors should be handled together to improve families' healthy behaviors and functions.

Our findings revealed that FF is a significant factor affecting lifestyle among adolescents. Families with poor FF cannot effectively manage emotional and instrumental problems, do not accurately follow the steps of problem-solving, and cannot effectively fulfill the basic needs of children such as the need for healthy nutrition and a safe living environment.<sup>[32]</sup> Adolescents are usually seeking autonomy in communications and roles and role model from their parents. Therefore, parents' adequate knowledge about the negative and positive effects of their behavioral patterns and their effects on adolescents can help them promote their healthy lifestyle.<sup>[38]</sup> Members in families with good FF provide each other with adequate support and kindness; hence, the family environment turns into a safe place for adolescents to express their problems and concerns, receive adequate attention, and feel worthy.<sup>[39]</sup> Contrarily, inadequate behavioral control in families prevents the development of health-promoting habits and behaviors such as regular physical activity, health responsibility, and stress management.<sup>[34]</sup> Overall, families with poor FF have children with unhealthy lifestyle manifested by escaping responsibility toward

health, attempts to receive support from people out of the family, limited engagement in physical activity, unhealthy nutrition, and high levels of stress.<sup>[17]</sup>

This study had some limitations, which limit the generalizability of its findings. The study was conducted only on female adolescents in a city. The samples were also done only in the south of Tehran. Future studies are suggested to replicate this study on larger samples of adolescents from both genders and different areas. Also, it is necessary to study different age groups and compare the results to assess the importance of FF.

## CONCLUSION

This study concludes that HPL and FF are greater than the possible median scores. Also, FF can be a significant predictor of HPL. In families with better FF, problem-solving is performed more effectively, roles and responsibilities are clear and flexible, interpersonal relationships are strong and effective, members effectively communicate their emotions and receive adequate support, and conflicts are clearly communicated and properly managed. The findings of this study can be useful for the managers of the health system, families, health educators, and researchers. Therefore, healthcare authorities and policymakers need to pay greater attention to FF and consider it in their programs for promoting a healthy lifestyle among adolescents.

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## Conflicts of interest

There are no conflicts of interest.

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