Improving Family Health Climate, Effect of Role Modeling and Maternal Support in Female Student

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Abstract

Introduction: Girls can use their mothers emotional, informational and behavioral support to perform healthy behaviors due to their constant access to their mothers. This study aimed to evaluate the effect of role modeling and maternal support in the family to improve healthy behaviors and perceived Family Health Climate (FHC) in female students.

Methods: In this quasi-experimental study 261 female students (133 in intervention group and 128 in control group) and 223 mothers (109 intervention and 114 control) were selected, using cluster multi-stages sampling method and entered the study. Participants completed the FHC scale at three stages (Before intervention, immediately after the intervention and two month after intervention). A training programme which comprised 12 sessions for students and 6 sessions for their mothers using collaborative learning techniques and printed materials was conducted with the experimental group. Data were analyzed using SPSS20 via chi-square test, independent t-test, and Repeated Measures ANOVA at significance level of 0.05.

Results: Before the intervention, there was no significant difference between demographic variables and the score of FHC scale in both groups ($p < 0.05$). Immediately and two months after the intervention, the experimental group (female students and their mothers) showed a significant increase in dimensions of FHC including FHC-NU and FHC-PA (their subscales) compared to the control group ($p < 0.05$).

Conclusions: Educating and informing mothers about their role model defects for their children, especially girls, can make them more aware of health-oriented behaviors towards their children. Such findings reinforced the importance of focusing on actions to encourage a healthy lifestyle (healthy diet and physical activity) in students with a focus on role modeling and parental support, especially mothers.

Background

well-being and Positive social functioning are rooted in childhood. Perhaps the strongest predictor of these paths is the family quality of life and the parental environment in which the child is placed(1, 2). Adolescents' health behaviors are influenced by social contexts, such as peer groups, the school environment, and the family. The family, because of its continual effect on the health behavior and physical activity of children and adolescents is especially important(3). while the strong association between physical activity and nutrition with health has been proven (4, 5).

The family is at the core of the socialization of its members, a place where values are passed on to individuals, where ideas are learned and adopted, and beliefs and norms of behavior are acquired. Its members are divided into separate subsystems through symbolic boundaries, each of them contributes to the functioning of families by performing the roles and responsibilities necessary for the whole(3, 6). According to the approach of the family system, the family is more than the sum of individuals. This theoretical framework requires interactions within and between individuals also between individuals and the shared family environment. therefore, the characteristics of the family environment should affect the

behavior of individuals and individual factors. One aspect of the family environment may be the family health climate (3, 7).

Family health climate (FHC): Family health climate is defined as shared perceptions and cognitions about a healthy lifestyle within the family. It reflects the individual experience of daily family life, evaluating health-related issues and expectations according to common values, routine behaviors, and patterns of family interaction. The FHC acts as a framework for health-related behaviors, is the basis for regulating health-related behaviors, and provides a reference for evaluating and interpreting individual behaviors. Thus, the FHC is an aspect of the family environment that shapes the daily health behaviors of family members. FHC can be assessed for healthy eating using the FHC-Nutrition scale and physical activity using the FHC-Physical Activity scale. FHC represents a variable at the family level that is related to internal and interpersonal relationships with the family environment and individual factors (7).

family health climate has been demonstrated to affect the weekly physical activity and the consumption of nutritious foods in adolescents and children(3, 8). A positive family health climate is defined as an environment where eating healthfully and being physically active is highly valued and an integral part of the daily family life. The family health climate model can be utilized to understand how an individual's family can shape their health behaviors (7).

Parents and children are part of a family, which in its family members influence each other's behavior, and this indicates mutual influence(9). It has been reported that due to the ongoing communication between behaviors and attitudes of parents and children, modeling by parents has a clear impact on how children think and behave about food and physical activity(10). Parents also play a key role in transmitting health information and supporting their children's healthy behavior (11)

Mothers are generally primary caregivers who usually provide a framework for children's meals with specific foods and show them how much they can eat(12–14). On the other hand, numerous studies show that mother modeling of healthy active behaviors has a more impact on children Compared with the paternal model(15, 16), also, compared to other parent-child relationships, interdependence and emotional dependence in the mother-daughter relationship is stronger, and the nature of the relationship plays an important role in the social and psychological well-being of girls. Therefore, girls can use their emotional, informational and behavioral support to perform healthy behaviors due to their constant access to their mothers(17).

This study aimed to evaluate the effect of role modeling and maternal support in the family to improve healthy behaviors in girls. And in answer to this question that; Is the intervention of role modeling and mother's support program effective in changing the family health climate perceived by female students and their mothers?

Methods

The purpose of this study was to evaluate the impact of the educational program for students and their mothers, using role modeling and mothers' support in promoting a perceived family health climate in female students and their mothers. Based on this goal, a quasi-experimental plan consisting of an intervention group and a control group was approved in which pre-test, post-test and 2-month follow-up were designed to evaluate the effects of the program. Ethics approval was obtained from research ethics board of the Shiraz University of Medical Sciences. The study was approved by the ethics committee on 07/08/2019 (IR.SUMS.REC.1398.896).

Participants in this study were fifth-grade female students who studied in Shiraz schools and their mothers. Sampling was done by the cluster sampling method among the four education districts of Shiraz, each of which has 43, 39, 58, and 55 schools, respectively. From the four districts, two districts were randomly selected (districts 2 and 4). In each of the selected districts, four schools (eight schools in total) were randomly selected, of which two schools were randomly selected as the control group and two schools were randomly selected as the experimental group in each district. In each school, two classes were randomly selected, and eventually, 261 female students were selected as mentioned in the previous article by the authors(18).

In the data collection process, the first step was to visit the selected schools, meet with school principals and inform them about the content and purpose of the study. After receiving the approval of the school principals, the pre-test questionnaire form was completed by 261 fifth-grade students who met the inclusion criteria, while the questionnaire forms for mothers in the distribution envelopes were sent to them by the children. The researchers after 3 working days returned to the schools and the questionnaire forms completed by the mothers were collected. Based on the collected data, mothers' questionnaires were considered for further analysis. A total of 223 mothers after contacting them by telephone and stating the objectives and content of the study, as well as the length of the study period, agreed to participate in the study. Among the mothers who agreed to participate in the program, (109 intervention) and (114 control) were divided into two groups based on the division of their children's schools and classes. At the beginning of the intervention, mothers were adjusted for level of education, and occupation to ensure homogeneity of groups, as these factors were thought to be likely to distort the results. The demographic characteristics of the students in the intervention group and the control group are presented in Table 1.

The inclusion criteria for female students and their mother were: to be studying in public schools in Shiraz, their grade of education should be fifth, to complete the written informed consent form by students and their mothers and the exclusion criteria were: absenteeism in educational sessions for two sessions or more, refusing to continue participating in the project, leave the research environment (such as changing schools, etc.).

Data collection tools included demographic questionnaire and family health climate scale.

Demographic questionnaire included the age of the student, parental occupation, parental education, number of family members.

The Family Health climate scale was developed by Niermann et al. in 2014 to assess family members' health behaviors. This scale includes two separate scales: FHC-PA contains 14 questions with three subscales (value, cohesion, and information) and FHC-NU consists of 17 questions with four subscales (value, communication, cohesion, and consensus). Answers were given on a four-point rating scale (0 = "definitely false," 1="rather false," 2="rather true," and 3 = "definitely true"). In a study by Niermann et al., mothers, fathers, and adolescents completed a questionnaire separately. The internal correlation was α FHC-PA = 0:92 and α FHC-NU = 0:86 for the mothers, α FHC-PA = 0:90 and α FHC-NU = 0:86 for the fathers, and α FHC-PA = 0:90 and α FHC-NU = 0:85 for the adolescents(7).

In the Persian version of the FHC-Scale, Cronbach's alpha coefficient for FHC-PA in female students and their mothers respectively was 0.88 and 0.86 for the whole scale. Cronbach's alpha coefficient for FHC-NU in female students and their mothers respectively was 0.83 and 0.92 for the whole scale(18).

The education program for students and their mothers was implemented with the permission of the school administration. The program included 12 sessions for students and 6 sessions for their mothers.

In the student sessions, there were six sessions related to healthy eating education and the promotion of eating behaviors. At the beginning of the sessions, students received healthy snacks such as fruit, milk, or healthy pre-prepared foods. During the sessions, various methods were used, such as; Lectures on general topics, use of audio-visual presentation, questions and answers, problem-solving, sample cases, asking students to make a list of healthy meals with the help of mothers, as well as making a list of meals that students Usually prefer to use and then a discussion was held about it. Six sessions related to physical activity were performed by doing the favorite sports of the students with the cooperation and presence of a physical activity instructor. Also during the sessions about the minimum physical activity required by adolescents and the definition of moderate to vigorous physical activities as well as types of sports such as endurance, stretching, etc. was educated through educational videos, lectures, and booklets. The research team also coordinated with a sports club to facilitate enrollment in a sports class for the intervention group.

In the mothers' group, due to the busy schedule of mothers, the number of sessions was less, so more nutritional information and physical activity were provided to mothers in the form of short texts through social media. Three sessions of nutrition education were conducted to get acquainted with the nutrition groups as well as the nutritional needs of adolescents through lectures, questions, and answers, audio-visual presentations, and brainstorming. Mothers were also encouraged to cooperate and advise on preparing their children's meal lists and to involve children in choosing food when shopping. Three physical activity sessions, first in the form of lectures and informing them of the goals of physical activity sessions and getting their consent to attend a class session at a coordinated sports club, to practice sports that did not require equipment, and also to encourage them to performed regular physical activity. Also, physical activity training videos that were appropriate for mothers and their daughters were shown. They were asked to arrange family walks in their free time and to encourage children and other family

members to work as role models and provide basic and necessary facilities for their children to do physical activity.

When the questionnaire was completed by the target group, healthy nutritional snacks were provided to the students and after the intervention and data collection, booklets and educational videos were provided to the control group.

The collected data were analyzed using SPSS version 20. A Chi-square test was used to check the homogeneity of demographic variables in the control and intervention groups and a t-test was used to check the mean of the student's age in the two groups. After that, an independent t-test and Repeated Measurement Anova at the significance level of 0.05 to examine the impact of the intervention were done.

Findings

A total of 261 students were included in the study, including 133 in the intervention group and 128 in the control group. As shown in Table 1, the chi-square test did not show a significant difference between the intervention and control groups in terms of demographic variables ($p < 0.05$). In other words, the two groups were identical in terms of these characteristics. The results of t-test showed that there was no statistically significant difference between the mean of the students' age in the intervention and control groups ($p = 0.254$). The mean of the students' age in the intervention and control groups was 19.57 and 10.50 years, respectively.

Table 1

Demographic characteristics of students in the two groups of intervention and control

demographic variables		Number of people in the intervention group	Number of people in the control group	p-value *
Mother's education	Primary	5	3	0.113
	High school	9	3	
	Diploma	33	36	
	Bachelor	66	72	
	Master degree and higher	20	14	
Father's education	Primary	8	3	0.235
	High school	7	7	
	Diploma	39	48	
	Bachelor	54	56	
	Master degree and higher	25	14	
Mother's occupation	Employee	50	41	0.158
	housewife	72	82	
	self-employment	11	5	
	Retired	0	0	
Father's occupation	Employee	64	52	0.480
	worker	5	9	
	self-employment	57	60	
	Retired and unemployed	7	7	
Number of family members	3	33	24	0.639
	4	70	72	
	5-6	29	30	
	7 and more	1	2	

The results showed that the dimensions of FHC including FHC-NU and FHC-PA (their subscales) in the sample of students in the intervention group after the intervention were significantly different from before the educational intervention, but in the control group this difference was not significant. At the beginning of the intervention, there was no significant difference in the mean scores of FHC dimensions and their

subscales between the two groups, but immediately after the intervention and 2 months after the intervention (follow-up stage) there was a significant difference (Table 2).

Table 2

Comparison of the mean score of FHC in the two groups of intervention and control before the intervention, immediately after the intervention and 2 months after the educational intervention in female students

variable	Group	Before intervention M±SD	immediately after the intervention	two month after intervention M±SD	P-Value [□]
FHC-NU	experimental	27.85±10.38	39.14 ± 9.47	32.58 ± 11.71	< 0.001
	control	28.40±9.45	29.50 ± 10.19	28.27 ± 11.23	0.614
	P-Value [□]	0.876	< 0.001	0.005	
communication	experimental	7.37 ± 4.38	10.50 ± 4.31	8.73 ± 4.19	< 0.001
	control	7.34 ± 4.33	7.75 ±4.23	7.50 ± 4.10	0.759
	P-Value [□]	0.774	< 0.001	0.027	
Value	experimental	6.61 ± 3.23	10.56 ± 2.36	8.58 ± 2.96	< 0.001
	control	6.67 ± 3.60	7.43 ± 3.59	6.96 ± 3.60	0.190
	P-Value [□]	0.841	< 0.001	< 0.001	
Cohesion	experimental	10.57 ± 4.02	12.99 ± 3.43	10.69 ± 4.24	< 0.001
	control	10.86 ± 3.71	10.90 ± 4.39	9.86 ± 4.14	0.122
	P-Value [□]	0.881	< 0.001	0.133	
Consensus	experimental	3.30 ± 2.81	5.18 ± 2.89	4.58 ± 2.46	< 0.001
	control	3.47 ± 2.97	3.49 ± 2.70	3.95 ± 2.30	0.151
	P-Value [□]	0.734	< 0.001	0.046	
FHC-PA	experimental	18.09 ± 11.14	27.37 ± 11.02	22.00 ± 9.65	< 0.001
	control	18.98 ± 11.66	20.43 ± 11.12	19.52 ± 9.58	0.802
	P-Value [□]	0.527	< 0.001	0.052	
Information	experimental	4.08 ± 4.18	6.88 ± 4.35	5.43 ± 3.54	< 0.001
	control	4.62 ± 4.29	5.27 ± 3.92	4.83 ± 3.08	0.378
	P-Value [□]	0.477	0.008	0.176	
Cohesion	experimental	7.38 ± 5.24	11.79 ± 3.59	8.98 ± 4.44	< 0.001
	control	8.00 ± 4.79	8.36 ± 4.45	7.97 ± 4.52	0.736

	P-Value	0.227	< 0.001	0.053	
Value	experimental	7.21 ± 5.10	11.35 ± 3.75	9.57 ± 4.21	< 0.001
	control	7.07 ± 4.92	8.62 ± 4.49	8.31 ± 4.38	0.158
	P-Value	0.812	< 0.001	0.028	

Independent t-test

Independent t-test

Repeated Measurement

Result of intervention in mothers:

The results of the t-test showed that there was no statistically significant difference between the mean of the mother's age in the intervention and control groups ($p=0.061$). The mean of the mother's age in the intervention and control groups was 38.94 and 37.47 years, respectively. Similarly, the mean age of student's fathers in the intervention group was 42.95 and in the control group was 42.40 years. The independent t-test showed the two groups were homogeneous ($p=0.457$). There was no significant difference between the two groups of intervention and control before educational intervention as shown in Table 1 in the level of education of mother and father, parents occupation status and the number of family members, so the two groups were homogeneous in terms of these variables.

The results showed that the dimensions of FHC including FHC-NU and FHC-PA (their subscales) in the sample of mothers in the intervention group after the intervention were significantly different from before the educational intervention, but in the control group this difference was not significant. At the beginning of the intervention, there was no significant difference in the mean scores of FHC dimensions and their subscales between the two groups of mothers, but immediately after the intervention and in follow-up stage there was a significant difference (Table 3).

Table 3

Comparison of the mean score of FHC in the two groups of intervention and control before the intervention, immediately after the intervention and 2 months after the educational intervention in mothers

variable	Group	Before intervention M±SD	immediately after the intervention	two month after intervention M±SD	P-Value [□]
FHC-NU	experimental	25.72±8.43	41.02 ± 7.27	34.69 ± 11.71	< 0.001
	control	25.78±9.04	28.91 ± 12.32	26.44 ± 12.84	0.120
	P-Value [□]	0.961	< 0.001	< 0.001	
communication	experimental	6.64 ± 3.70	12.34 ±2.56	9.92 ± 3.85	< 0.001
	control	6.88 ± 3.74	7.92 ±4.25	7.13± 3.98	0.126
	P-Value [□]	0.817	< 0.001	< 0.001	
Value	experimental	6.62 ± 2.38	9.82 ± 2.33	8.54 ± 2.69	< 0.001
	control	6.79 ± 2.61	7.51 ± 3.60	6.80 ± 3.54	0.142
	P-Value [□]	0.628	< 0.001	< 0.001	
Cohesion	experimental	8.63 ± 3.55	12.84 ± 2.67	11.01 ± 3.50	< 0.001
	control	8.46 ± 3.77	9.29 ± 4.40	8.22 ± 4.73	0.213
	P-Value [□]	0.724	< 0.001	< 0.001	
Consensus	experimental	3.83 ± 2.52	6.02 ± 2.25	5.22 ± 2.33	< 0.001
	control	3.65 ± 2.43	4.19 ± 2.43	4.29 ± 2.50	0.153
	P-Value [□]	0.884	< 0.001	0.029	
FHC-PA	experimental	19.51 ± 8.96	27.01 ± 6.66	22.47 ± 8.50	< 0.001
	control	19.62 ± 8.86	22.36 ± 8.69	21.36 ± 8.95	0. 229
	P-Value [□]	0.924	< 0.001	0.344	
Information	experimental	4.31 ± 3.39	6.72 ± 2.82	4.68 ± 3.07	< 0.001
	control	4.86 ± 3.45	5.56 ± 3.34	5.58 ± 3.09	0.297
	P-Value [□]	0.812	0.009	0.052	
Cohesion	experimental	7.67 ± 3.91	10.17 ± 4.45	8.22 ± 4.44	< 0.001
	control	7.47 ± 3.85	8.20 ± 4.75	7.47 ± 4.52	0.575

	P-Value	0.727	< 0.001	0.197	
Value	experimental	7.53 ± 4.12	10.11 ± 2.87	9.57 ± 4.21	< 0.001
	control	7.29 ± 4.05	8.60 ± 3.82	8.31 ± 4.38	0.060
	P-Value	0.689	0.002	0.016	

Independent t-test

Repeated Measurement

Discussion

Girl's health behaviors align with their mothers for a number of reasons; Girls eat the food that their mothers prepare for them(19), they at an early age are more likely to pattern from their parents' eating behaviors(20) and children with active mothers are more likely to be active than children with non-active mothers(21). Children's preferences for certain foods are usually a reflection of eating at home(19). Accordingly, researchers consider mothers to be the main cause of change in influencing their children's diet and physical activity(22). And mothers who are trained in healthy eating and physical activity are more likely to engage in health-oriented behaviors for their children(19).

We investigated the effect of Role Modeling program training and mothers' support on the level of perceived family health climate in female students and their mothers compared to the control group (without support program and role modeling).

Because of the researcher's relationship with the students, all students participated in the study and 196 mothers participated in the study based on the inclusion criteria and their satisfaction about 75%.

In the study, it was found that the average scores before intervention for the children (Approximately 27) and mother's (Approximately 25) in the intervention and comparison groups were low, considering that the maximum possible scores of FHC-NU is 51. This is thought to arise from the fact that the sample of the study was drawn from a general population who have not experienced nutritional and physical activity interventions.

The process measures of the current study are similar to one study, which also found that having family participation specially mothers on their school based intervention was an important component of the program(23). However, this current study helps to the growing body of literature highlighting the importance of family involvement in influencing their children's nutritional and physical activity status (24–26). This may be because mothers act as an important role model and comprehensive supporter over their child's eating behaviors and physical activity, (27) therefore may want to actively participate in activities in the field of these important issues.

According to Goodwin et al.'s research, in many communities, women have become socialized as caregivers and maintainers of the family unit by preparing food, caring for family members, and talking to children to become a productive adult(28). Therefore, it seems that the results of the present study also confirm this assertion and women can be considered as promoters of family health, especially in developing countries where mothers' lives are very closely related to their children's lives(28). Therefore, by improving the perceived family health climate in mothers, both in the field of nutrition and physical activity, positive results can be seen in the perceived health climate of other family members, especially girls who have a closer relationship with their mothers.

This is while Elizabeth et al. in their study, argue that mothers strive to achieve health goals that are incompatible with their living conditions and those of family members (in terms of physical activity and diet) at the expense of family relationships (especially with children) and their own health. Of course, they also point out that when these cares and goals are considered as a normal duty of women and all the duties (duties of mothers in relation to improving the nutrition of family members and sports habits, buying food, cooking, taking children to exercise) be the responsibility of the mother, it will be harmful(29). Therefore, it seems that the long-term results of such interventions on mothers should be examined and more accurate results reported.

The follow-up phase of the study was associated with the prevalence of COVID-19 epidemic, so it seems that the decrease in physical activity in both groups can be related to the prevalence of COVID-19 epidemic. As Shahidi et al. In their study point out that the prevalence of COVID-19 epidemic has limited the amount of physical activity in this time period(30). Robinson et al. Also reported negative changes in eating and physical activity during the prevalence of the COVID-19 epidemic among UK adults, which is consistent with the results of the present study(31).

Conclusion

The results of the present study showed that despite the decrease in the amount of physical activity of mothers in the follow-up and epidemic stage of COVID-19, it did not reduce the amount of physical activity of female students, which can be referred to the supportive role of mothers. They have supported their children for health-oriented behaviors by enduring the stress of the COVID-19 outbreak. Such findings reinforced the importance of focusing on actions to encourage a healthy lifestyle (healthy diet and physical activity) in students with a focus on role modeling and parental support, especially mothers. Also, educating and informing mothers about their role model defects for their children, especially girls, can make them more aware of health-oriented behaviors towards their children.

Abbreviation

FHC: Family health climate

Declarations

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Author's contributions:

JO, MHK, LGH, MK, AA and RZ assisted in conceptualization and design of the study, oversaw data collection, conducted data analysis and drafted the manuscript. JO and MHK conceptualized and designed the study, assisted in data analysis and reviewed the manuscript. JO, LGH, MK and AA, RZ assisted in study conceptualization and reviewed the manuscript. All authors read and approved the final manuscript.

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Availability of data and materials:

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request

Ethical approval and consent to participate:

The study was approved by the ethics committee of Shiraz University of Medical Sciences (IR.SUMS.REC.1398.896). Also, the Research Center of Shiraz University of Medical Sciences approved the method used based on the purpose of the study with the code (98-01-04-19514). The informed consent to participate in the study was sent to student's parents and completed by them to express their satisfaction with their children's participation in the study. Also, the informed consent was completed by the mothers to participate in the study. Confidentiality and anonymity were ensured. All methods were performed in accordance with WMA Declaration of Helsinki, ethical principles for medical research involving human subjects.

Consent for publication:

Not applicable.

Competing interests:

The authors declare that they have no competing interests.

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