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Original Article

Mothers' Education for Improving Their Children's Self-efficacy About Physical Activity

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Abstract

Background: This study aimed to determine the effect of mothers' education on improving children's self-efficacy regarding physical activity.

Methods: This descriptive-interventional, quasi-experimental study was performed in Iran during 2021. First, 384 mothers were selected from 5 health centers in Mashhad based on the inclusion criteria. Then, 102 mothers with children aged 6-7 years were chosen using a simple random method and placed in two test (n = 51) and control (n = 51) groups. The educational program was held based on self-efficacy theory for the test group in five sessions. The data were collected in three stages (before, immediately, and three months later) using a valid researcher-made questionnaire. Eventually, the data were analyzed by SPSS 20 using chi-square, Mann-Whitney, Friedman, and Kruskal-Wallis.

Results: Descriptive statistics demonstrated that demographic variables had a significant relationship with physical activity self-efficacy in the children under study ($P<0.05$). Regarding the self-efficacy score in the test group, before the educational program, it was 40.8 ± 74.27, and immediately after the intervention and in the follow-up stage, it further increased to 53.9 ± 21.51 and 54.9 ± 31.63, respectively. This increase was statistically significant ($P<0.05$) with an effect size of 0.53. However, no significant differences were observed in the control group.

Conclusion: The results revealed that an educational program based on self-efficacy theory can be effective in improving children's physical activity.

Keywords: Health education, Self-efficacy, Physical activity, Children

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Introduction

Physical activity is defined as any voluntary bodily movement produced by skeletal muscles that requires energy expenditure (1). Regular physical activity is one of the indicators of the health of societies and reduces chronic diseases, especially cardiovascular diseases, diabetes, and osteoporosis, and prevents the tendency of teenagers toward addiction, delinquency, and unhealthy entertainment (2). A recent study has demonstrated that nearly one-third (31%) of the world's adult population (1.8 billion adults) are physically inactive (3). Examining the recent 10-year trend of insufficient physical activity in leisure time among Iranian people shows that during the past years, the amount of physical activity has decreased by 30%, so that the amount of insufficient physical activity in 2006 was 53.4% and 78.6% for men and women, and it reached 58.5% and 94.1% in 2016 (4). In their growing age, children are highly vulnerable due to their physical, psychological, and social characteristics, and the future of any society is related to the health of its children (5). Good hygiene habits learned by children can have a long-lasting effect on their health (2). The development of useful health habits during childhood is highly important because it is easier to create healthy behaviors during this period of development than in later periods (5).

Promoting physical activity is crucial for children's health, and parents play a vital role in shaping their children's behavior and instilling the habit of being physically active (6). Parents can unintentionally reduce their children's physical activity by setting restrictions and rules (7). Taheri et al, focusing on determining the prevalence of obesity and overweight in children and its relationship with parental obesity, indicated that educating families is essential for improving their lifestyle (8). Various factors affect participation in physical exertion for young people (9). However, there is substantiation that the educational position of parents is an aspect to consider (10). On the other hand, self-efficacy is an important factor for the successful

performance of an individual and the acquisition of the basic skills necessary for accomplishing things (11). Self-efficacy is a crucial element of Bandura's social cognitive theory (12), which is defined as the perceived capability to perform a target behavior (13). A previous study indicated that declines in physical activity during the period from late middle school through late high school are inversely associated with self-efficacy for overcoming barriers to physical activity and perceived support from family (14). In addition, Lindsay et al demonstrated the significance of the family in shaping children's physical activity behavior and the undeniable impact of children's health on society's health (15). This is particularly true for younger children who, compared to adolescents, require more care and spend more time with their parents (6,16). Therefore, this study was conducted to determine the effect of education on mothers with children aged 6–7 years, referring to Mashhad health centers, based on self-efficacy theory on improving children's physical activity in 2021.

Materials and Methods

Study Design

This quasi-experimental study was conducted in two descriptive and intervention stages in 2021 in Mashhad, a major city in Iran. A descriptive study was performed to identify the confounding factors related to physical activity and reduce the effect of these changes in the intervention. After completing this stage, an intervention study was conducted to determine the effect of self-efficacy training on physical activity.

Sampling

In the first phase of the study (the descriptive phase), 384 mothers with children aged 6–7 years were selected from five health centers in Mashhad. The required sample was entered into the study as proportional stratified sampling, according to the population of each center. The sample size was calculated using the following formula with a 95% confidence interval, a 5% error rate, and considering 0.5 standard deviation of the self-efficacy variable in physical activity (17).

$$n = \frac{z^2_{1-\frac{\alpha}{2}}\delta^2}{d^2}$$

In the second phase (the intervention phase), 102 mothers with children aged 6-7 years (considering the following formula and 20% drop in sample volume) were selected using a simple random method and placed in two test (n = 51) and control (n = 51) groups.

$S_1 = 88.07$

$S_2 = 72.09$

$\bar{X}_2 = 112.37$

$\bar{X}_2 = 80.40$

$Z_{1-\frac{\alpha}{2}} = 1.96$

$Z_{1-\beta} = 0.85$

n = 100

$$n = \frac{\left(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta}\right)^2 (S_1^2 + S_2^2)}{(\bar{X}_1 - \bar{X}_2)^2}$$

Two centers were randomly selected among the five health centers in Mashhad using the lottery method to select the research samples for this phase. Participants who met the conditions for entering the study (being mothers with children aged 6–7 years, having no physical or mental diseases of the mother and child, having a smartphone, having literacy in reading and writing, and giving written and informed consent) were included in the study. On the other hand, the exclusion criteria were unwillingness to participate in the study, absence of more than one session in the educational program, and occurrence of any medical emergencies (Figure 1).

Intervention

The educational program is a combination of face-to-face (two sessions of 40-45 minutes conducted in the health center classrooms by specialists in health education and health promotion and physical education instructors) and virtual (three sessions of 30 minutes once a week using social networks Eitaa [an Iranian messaging app], WhatsApp, and Telegram) sessions (Table 1). It is worth mentioning that face-to-face classes were held with six to seven people.

Data Collection

A researcher-developed questionnaire using the framework of self-efficacy theory was considered for data collection. This questionnaire included demographic

Table 1. Educational Program Sessions for Mothers Based on Self-efficacy Theory Structures in Improving Children's Physical Activity Level

Session	Training	Content	Equipment	Intervention Method
1, 2	Face to face	- Defining self-efficacy - Describing the role of promoting self-efficacy in children's health - Presenting ways to improve self-efficacy in children	Computer, data projector, whiteboard, markers, and booklets	Lecture, questions and answers, group discussion, and brainstorming
3, 4, 5	Virtual	- Reviewing what was mentioned in face-to-face meetings - Answering questions	Social networks and pamphlets	Questions and answers

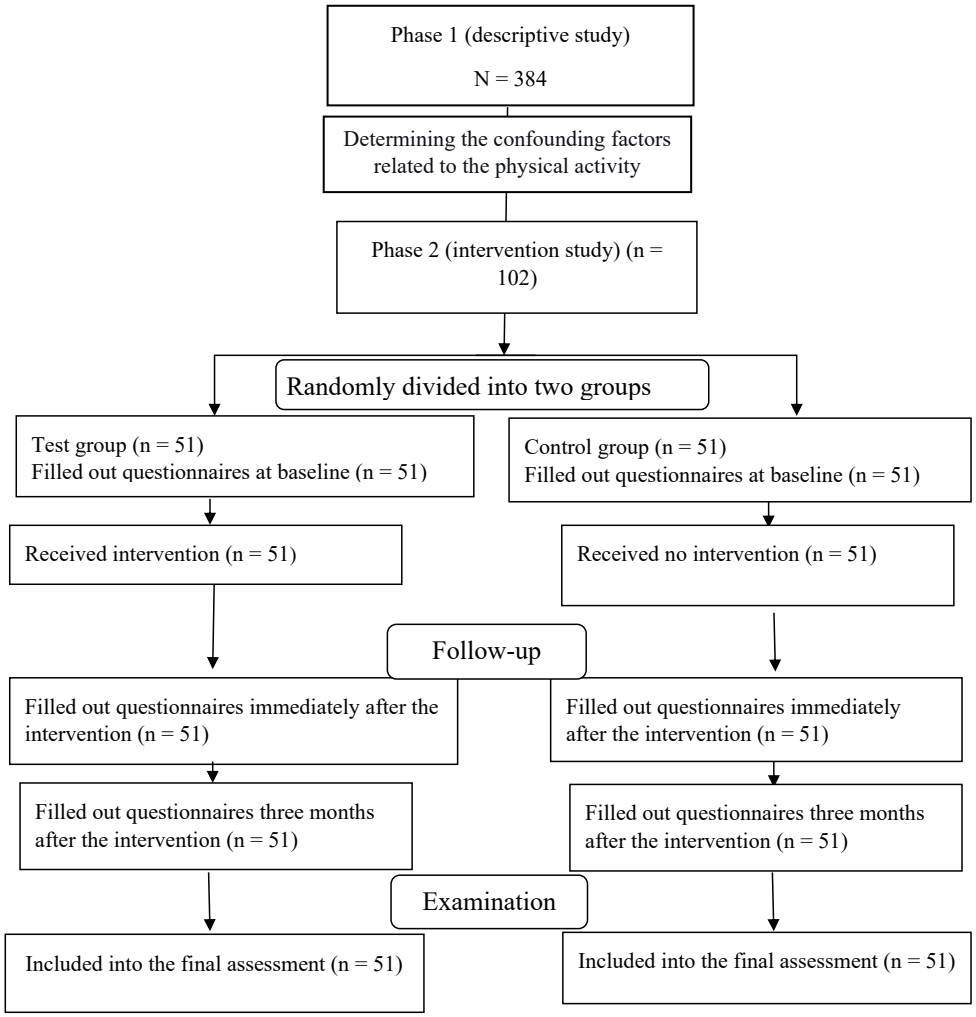

Figure 1. Research Design and Sampling Method

information (gender of the child, number of children's weight, height of the child, father's education, father's occupation, mother's education, mother's occupation, the amount of time a child watches TV per day, and exercise). In addition, it contained 16 physical activity self-efficacy questions (e.g., *I am sure that my child can have enough physical activity despite the problems in life*, *I am sure that my child can teach others what he has learned about the importance of physical activity*, and *I am sure that physical activity can be one of the most interesting things in my child's daily life*). The questionnaire was scored on a Likert-type scale ranging from never (0) to always (5). The scoring range was 0–80 points. The validity of this tool was assessed using face and content validity by an expert panel of 12 health and sports education specialists who obtained their opinions and calculated a content validity index of 079 and a content validity ratio of 086. The reliability of this tool was confirmed by computing an *intraclass correlation* of 0.97 and Cronbach's alpha of 0.94. Questionnaires were completed and self-reported by mothers before, immediately, and 3 months after the intervention.

Statistical Analysis

The data were analyzed using SPSS 20 and then checked for normality before analysis. The appropriate parametric or nonparametric test was utilized according to statistics. Owing to the nonparametric nature of the data, Kruskal-Wallis, Mann-Whitney, Friedman, and chi-square tests were employed for data analysis. Finally, means and standard deviations, as well as frequencies and percentages, were used for qualitative demographic and quantitative variables, respectively.

Results

Descriptive Results of the Study

The findings demonstrated that prior to the start of the educational program, there was no significant difference between the test and control groups in the number of children, weight, height, gender, mother's education and occupation, husband's education and occupation, television viewing, or daily physical activity. The characteristics of the two groups were identical ($P < 0.05$). It was further revealed that there was a substantial connection between the mother's education, mother's occupation, the wife's occupation, and physical activity self-efficacy ($P < 0.05$). However, no significant relationship was found between gender, father's education, father's occupation, TV-watching habits, and physical activity self-

efficacy ($P > 0.05$, Table 2).

Interventional Findings

According to analytical results, the average weight and height of the children under study in the test group were 20.76 ± 2.93 and 121.61 ± 2.92, respectively, and 55% of them were boys. In addition, 72% of mothers had a college education, and 65% of fathers had a university education. Further, most of them (86%) were employed, and 41% of children watched TV for more than 2 hours during the day (Table 3).

The self-efficacy score was 40.8 ± 74.27, 53.9 ± 21.51, and 54.9 ± 31.63 before the educational program, immediately after the intervention, and in the follow-up stage in the test group. The increasing trend in the score was statistically significant ($P < 0.05$). However, in the control group, there was no significant difference in this regard (Figure 2).

Table 2. The Relationship Between the Demographic Variables of the Research Samples and Their Related Characteristics With Self-efficacy

Variable	Variables	Mean ± SD	Number (Percent)	Test
Gender	Girl	42.5 ± 5.64	180 (47)	0.157
	Boy	41.74 ± 4.96	204 (53)	
Father's education	High school	41.22 ± 6.78	45 (12)	0.551
	Diploma	41.73 ± 5.55	86 (23)	
	College education	42.42 ± 4.91	253 (65)	
Father's job	Employed	41.99 ± 5.43	324 (84)	0.106
	Retired	46.33 ± 4.27	41 (11)	
	Unemployed	42.54 ± 3.69	19 (5)	
Mother's education	High school	40.67 ± 4.67	12 (3)	0.037
	Diploma	41.63 ± 5.66	86 (22)	
	College education	42.76 ± 5.18	286 (75)	
Mother's job	Employed	41.28 ± 5.43	115 (30)	0.024
	Housewife	43.69 ± 5.17	269 (70)	
TV-watching habits	2 hours or less than	41.9 ± 4.9	159 (41)	0.427
	Above 2 hours	42.43 ± 5.87	225 (59)	
Exercise	He/she is doing it	42.70 ± 5.57	139 (36)	0.021
	He/she is not doing it	41.25 ± 4.79	245 (64)	

Note. SD: Standard deviation.

Discussion

This study was conducted to determine the effect of education based on the self-efficacy theory in mothers with children aged 6–7 years on improving their children's physical activity. According to the findings, the average score for physical activity self-efficacy was within the

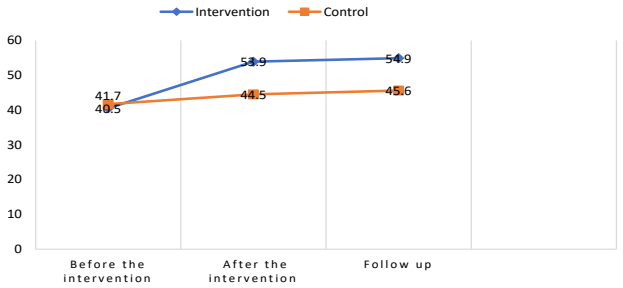

Figure 2. Comparison of the Self-Efficacy Score in the Test and Control Groups Before and Immediately After the Intervention and in the Follow-up Stage

Table 3. Survey of Demographic Variables and Related Characteristics in the Units Under Study Before the Educational Program in the Two Groups

Variable		Control Group	Test Group	*P* Value
Number of children, Mean ± SD		2.38 ± 1.01	2.67 ± 1.03	0.123
Child's weight, Mean ± SD		21. 06 ± 2.88	20.76 ± 2.93	0.515
Height of the child, Mean ± SD		122.37 ± 3.59	121.61 ± 2.92	0.246
Gender, No. (%)	Girl	25 (49)	23 (45)	0.246
	Boy	26 (51)	28 (55)	
Father's education, No. (%)	High school	7 (14)	5 (10)	0.691
	Diploma	10 (19)	13 (25)	
	College education	34 (67)	33 (65)	
Father's job, No. (%)	Employed	42 (82)	44 (86)	0.845
	Retired	6 (12)	5 (10)	
	Unemployed	3 (6)	2 (4)	
Mother's education, No. (%)	High school	0 (0)	3 (6)	0.213
	Diploma	12 (24)	11 (22)	
	College education	39 (76)	37 (72)	
Mother's job, No. (%)	Employed	13 (26)	21 (41)	0.093
	Housewife	38 (74)	30 (59)	
TV-watching habits, No. (%)	2 hours or less than 2 hours	30 (59)	30 (59)	1
	Above 2 hours	21 (41)	21 (41)	
Exercise, No. (%)	He/she is doing it	33 (65)	32 (63)	0.837
	He/she is not doing it	19 (37)	18 (35)	

Note. SD: Standard deviation.

average range (16–80). The distance between the lowest and highest test scores was used to classify the participants into weak, average, and good categories. People without sufficient self-efficacy are easily convinced that their behavior is futile when confronted with problems and tend to cease taking action (18). On the other hand, self-efficacy promotes preventive behaviors such as physical activity (19). This study is consistent with the findings of research conducted by Motamedi et al, as most participants in their study also exhibited moderate levels of physical activity self-efficacy (20).

In this study, there was no significant relationship between physical activity self-efficacy and certain intended variables, such as the father's education and occupation, gender, and TV-viewing habits ($P > 0.05$). However, a significant relationship was observed between the mother's education, occupation, daily exercise, and self-efficacy in physical activity. This finding suggests that mothers with higher education and homemakers are more likely to enhance their children's physical activity levels. Perhaps one of the reasons for this is that mothers with higher education are more aware of the benefits of physical activity and may have more opportunities to encourage their children to engage in more activities due to their housework. Of course, previous research has shown the associations between type of occupation and physical activity, reporting that those classified in higher-status occupations (e.g., requiring higher education) were engaged in more leisure-time physical activity but less overall physical activity when occupational physical activity was included, likely because higher-status occupations involve high sedentary time (21). In addition, children who engaged in the regular daily exercise had high physical activity self-efficacy, which is consistent with the findings of Lindsay et al and Pons et al (15, 22).

In this study, mothers were considered the main target group, and the results revealed that the self-efficacy of physical activity was improved in children by conducting training sessions for mothers. Researchers have found positive associations between the physical activity levels of parents and their children's physical activity levels (6,16). Consistent with the findings of the present study, the results of other studies conducted in this field confirmed that the family has an effective role in improving children's physical activity (7-8,23). The comparison of demographic factors between the test and control groups revealed no statistically significant differences. Furthermore, the findings demonstrated that employing self-efficacy strategies could significantly enhance the effectiveness of educational programs for children. These findings conform to the results reported by Owen et al (24) and Motamedi et al (20). Overall, the survey results indicated that providing effective training to key individuals who have an impact on others can enhance people's self-efficacy. Therefore, adequate and effective training, especially based on self-efficacy strategies, can lead to the development of positive health behaviors in children, and correct health behaviors at these ages can affect health in the following years. Thus, it is necessary to teach educational programs in the field of health promotion during childhood.

Limitations of the Study

Overall, it was revealed that increasing children's self-efficacy requires the cooperation of parents, especially mothers. Therefore, intervention in mothers as an important target group to increase children's physical activity self-efficacy was one of the strengths of the study. However, the limitation of this study was the use of the self-reporting method; the researchers attempted to reduce it as much as possible by explaining the objectives of the study to the mothers of the target group.

Conclusion

The finding revealed that teaching mothers using self-efficacy strategies can enhance children's physical activity levels. Considering that the family plays a significant role in children's education, it is possible to provide a context for changing the behavior of children and future generations by planning appropriate educational programs. In this way, we can help improve their lifestyle in the future. Finally, it is proposed that advanced investigations be conducted on mothers of overweight or obese children to increase the participation rate and motivation to take part in the study.

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Authors' Contribution

Conceptualization: Nooshin Peyman.
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Funding acquisition: Nooshin Peyman.
Investigation: Hadi Tehrani.
Methodology: Ensieh Akbarpoor and Vajihe Eslami.
Project administration: Hadi Tehrani.
Resources: Nooshin Peyman.
Supervision: Nooshin Peyman.
Writing–original draft: Maryam Mohammadi.
Writing–review & editing: Maryam Mohammadi.

Competing Interests

The authors declare that there is no conflict of interests related to the content of this paper.

Ethical Approval

The research received approval from the Medical Ethics Committee at Mashhad University of Medical Sciences (approval code IR.MUMS.REC.1396.301) and was performed in line with the principles outlined in the Declaration of Helsinki. All participants engaged in the study voluntarily and provided informed consent.

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References

1. World Health Organization (WHO). Global Recommendations on Physical Activity for Health. Geneva, Switzerland: WHO; 2009. Available from: http://www.who.int/ncds/prevention/

physical-activity/en.
2. Yekaninejad MS, Akaberi A, Pakpour Haji Agha A. Factors associated with physical activity in adolescents in Qazvin: an application of the theory of planned behavior. J North Khorasan Univ Med Sci. 2012;4(3):449-56. doi: 10.29252/jnkums.4.3.449. [Persian].
3. Strain T, Flaxman S, Guthold R, Semenova E, Cowan M, Riley LM, et al. National, regional, and global trends in insufficient physical activity among adults from 2000 to 2022: a pooled analysis of 507 population-based surveys with 5·7 million participants. Lancet Glob Health. 2024;12(8):e1232-43. doi: 10.1016/s2214-109x(24)00150-5.
4. Haji Hosni M. Monitoring report on the status of physical activity and sports in the leisure basket of Iranian households. Available at: file:///C:/Users/CLIENT/Downloads/19463.pdf. [Persian].
5. Taymoori P, Falhahi A, Esmailnasab N. Application of the health promotion model in studying physical activity behavior of students in Sanandaj, Iran. Journal of School of Public Health & Institute of Public Health Research. 2011;9(1):35-46. [Persian].
6. Ha AS, Ng JYY, Lonsdale C, Lubans DR, Ng FF. Promoting physical activity in children through family-based intervention: protocol of the "Active 1+FUN" randomized controlled trial. BMC Public Health. 2019;19(1):218. doi: 10.1186/s12889-019-6537-3.
7. Carver A, Timperio A, Hesketh K, Crawford D. Are children and adolescents less active if parents restrict their physical activity and active transport due to perceived risk? Soc Sci Med 2010;70(11):1799-805. doi: 10.1016/j.socscimed.2010.02.010.
8. Taheri F, Kazemi T, Ansarinezhad T, Sharifzadeh G. Prevalence of overweight and obesity in 2-5 year olds and its relationship with parental obesity. J Birjand Univ Med Sci. 2014;21(3):370-6. [Persian].
9. Pelegrín A, González-Garcia H, de Los Fayos EJ. [Perceived parental educational styles in adolescents, physical activity practitioners, federated and competitors]. Retos. 2019(36):92-6. doi: 10.47197/retos.v36i36.64592.
10. Määttä S, Kaukonen R, Vepsäläinen H, Lehto E, Ylönen A, Ray C, et al. The mediating role of the home environment in relation to parental educational level and preschool children's screen time: a cross-sectional study. BMC Public Health. 2017;17(1):688. doi: 10.1186/s12889-017-4694-9.
11. Bandura A. Cultivate Self-Efficacy for Personal and Organizational Effectiveness. In: Locke E, ed. Handbook of Principles of Organization Behavior. Oxford, UK: Blackwell; 2000.
12. Bandura A, Freeman WH, Lightsey R. Self-efficacy: the exercise of control. J Cogn Psychother. 2019;13(2):158-66. doi: 10.1891/0889-8391.13.2.158.
13. Bandura A. Health promotion by social cognitive means. Health Educ Behav. 2004;31(2):143-64. doi: 10.1177/1090198104263660.
14. Dowda M, Dishman RK, Pfeiffer KA, Pate RR. Family support for physical activity in girls from 8th to 12th grade in South Carolina. Prev Med. 2007;44(2):153-9. doi: 10.1016/j.ypmed.2006.10.001.
15. Lindsay AC, Arruda CA, De Andrade GP, Machado MM, Greaney ML. Parenting practices that may encourage and discourage physical activity in preschool-age children of Brazilian immigrant families: a qualitative study. PLoS One. 2019;14(3):e0214143. doi: 10.1371/journal.pone.0214143.
16. Yao CA, Rhodes RE. Parental correlates in child and adolescent physical activity: a meta-analysis. Int J Behav Nutr Phys Act. 2015;12:10. doi: 10.1186/s12966-015-0163-y.
17. Yu H, Zhu T, Tian J, Zhang G, Wang P, Chen J, et al. Physical activity and self-efficacy in college students: the mediating role of grit and the moderating role of gender. PeerJ. 2024;12:e17422. doi: 10.7717/peerj.17422.
18. Linnebur LA, Linnebur SA. Self-administered assessment of health literacy in adolescents using the newest vital sign. Health Promot Pract. 2018;19(1):119-24. doi: 10.1177/1524839916677729.
19. Guntzviller LM, King AJ, Jensen JD, Davis LA. Self-efficacy, health literacy, and nutrition and exercise behaviors in a low-income, Hispanic population. J Immigr Minor Health. 2017;19(2):489-93. doi: 10.1007/s10903-016-0384-4.
20. Motamedi M, Peyman N, Afzalaghaee M. Effect of education based on self-efficacy theory on health literacy, self-efficacy of regular eating habits and self-efficacy of regular physical activity in female students aged 15-18 years in Chenaran. J Sabzevar Univ Med Sci. 2020;27(2):303-11. [Persian].
21. Kirk MA, Rhodes RE. Occupation correlates of adults' participation in leisure-time physical activity: a systematic review. Am J Prev Med. 2011;40(4):476-85. doi: 10.1016/j.amepre.2010.12.015.
22. Pons M, Bennasar-Veny M, Yañez AM. Maternal education level and excessive recreational screen time in children: a mediation analysis. Int J Environ Res Public Health. 2020;17(23):8930. doi: 10.3390/ijerph17238930.
23. Dunton GF, Liao Y, Almanza E, Jerrett M, Spruijt-Metz D, Chou CP, et al. Joint physical activity and sedentary behavior in parent-child pairs. Med Sci Sports Exerc. 2012;44(8):1473-80. doi: 10.1249/MSS.0b013e31825148e9.
24. Owen MB, Curry WB, Kerner C, Newson L, Fairclough SJ. The effectiveness of school-based physical activity interventions for adolescent girls: a systematic review and meta-analysis. Prev Med. 2017;105:237-49. doi: 10.1016/j.ypmed.2017.09.018.