

Original Paper

A Comparative Effect of Child-to-Child and Health Educator to-Child Teaching Approaches on Nutritional Status in Elementary School Students



Mandana Farrokhmanesh¹, Nasrin Mokhtari Lakeh^{2*}, Shahla Asiri³, Ehsan Kazem Nezhad Leyli⁴, Alireza Ghaemi⁵, Siamak Afzali⁶

1. Nursing (MSc.), School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran.
2. Social Determinants of Health Research Center (SDHRC), Department of Nursing, Instructor, PhD Candidate in Educational Administration, School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran.
3. Social Determinants of Health Research Center (SDHRC), Department of Nursing, Instructor, PhD Candidate in Gerontology, School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran.
4. Social Determinants of Health Research Center (SDHRC), Bio-Statistics, Associate Professor, Guilan University of Medical Sciences, Rasht, Iran.
5. Health Sciences Research Center, Department of Basic Sciences and Nutrition, Assistant professor, School of Public Health, Mazandaran University of Medical Sciences, Sari, Iran.
6. General practioner, Mazandaran University of Medical Sciences, Sari, Iran.



Citation: Farrokhmanesh M, Mokhtari Lakeh N, Asiri Sh, Kazem Nezhad Leyli E, Ghaemi A, Afzali S. A Comparative Effect of Child-to-Child and Health Educator to-Child Teaching Approaches on Nutritional Status in Elementary School Students. *J Holist Nurs Midwifery*. 2018; 28(2):101-108. <https://doi.org/10.29252/HNMJ.28.2.101>

Running Title: Child-to-Child and Health Educator to-Child Teaching Approaches & Nutritional Status

doi: <https://doi.org/10.29252/HNMJ.28.2.101>

Article info:

Received: 11/08/2016

Accepted: 01/10/2017

ABSTRACT

Introduction: Nutritional problems are one of the most important health issues among school-aged children, and modification of the nutritional status in children is as well important.

Objective: Present study aims to determine the effectiveness of child to child teaching approach as compared to educator to child teaching approach on promotion of nutritional status of elementary school students in Rasht city in 2014-15.

Materials and Methods: This is an educational trial study. Samples were chosen by random-cluster sampling model through which 452 students aging 9-11 years were selected from third, fourth and fifth grades from elementary schools of different districts of Rasht. Tools consisted of demographic questionnaire and food frequency questionnaire (checklist) with 54 items on snacks. From 452 students, 188 students with unfavorable frequency were divided into three groups; 62 students in child-to-child group, 68 students in health educator-to-child group and 58 students in control group. An educational package (including pamphlets, booklets and posters) was taught by researcher on food pyramid, healthy and unhealthy snacks using role play and fruit festival conducted in three sessions each lasting 30 minutes for three level elementary students and health educators. Of course the control group received no intervention. Data was analyzed by descriptive and inferential statistics such as Chi Square, Mann Whitney and Kruskal Wallis tests.

Results: The differences of mean in score changes before and after education in child to child group was more effective than educator to child teaching group ($P=0.001$). Based on food frequency score obtained on nutritional status after teaching, the health educator to child group performed better than other groups ($P=0.014$).

Conclusion: Study findings indicated that child to child teaching was close to the performance of health educators in relation to promotion of nutritional status and favorable food frequency. Therefore in attention to potential ability of children in teaching, they can improve school health programs along with educator to child teaching approach.

Keywords:

Health education, Nutritional status, Students

* Corresponding Author:

Nasrin Mokhtari Lakeh, MSc.

Address: Social Determinants of Health Research Center (SDHRC), Department of Nursing, Instructor, PhD Candidate in Educational Administration, School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran.

Tel: +98 (13) 33553202

E-mail: lakeh.nasrin@gmail.com

Introduction

Childhood due to fast growth which is accompanied by biologic, psychologic and emotional changes increases nutritional needs. Attention to the natural development of children through healthy diet and continuous health support presents effective investigating for the health in future [1, 2]. In recent years, lifestyle changes have caused different societies to face problems of overweight and obesity in all ages especially during childhood and adolescence [3]. Diet in spite of its relation to growth and development may cause some health related problems during childhood [4]. Proper dietary habits in childhood may prevent diseases such as cardio-vascular [5] and osteoporosis in adulthood [6]. Improper dietary habits especially snacks with high fat is one of the most common factor of overweight and obesity in childhood. Study results in Rasht city indicated that the prevalence of overweight and obesity in the students of primary schools was 26.5 and 10.5 percent respectively [7]. Another study in Tehran showed significant statistical differences in frequency of snacks consumption in the morning, evening and free times and overweight and obesity [8]. One of the dietary problem of children is eating unhealthy snacks [2]. Results of a survey in Tehran [9] and another in Ghazvin [2] indicated that most students use sweets for snack. Education affects on the attitudes' students significantly [2]. The main feature of unhealthy snacks is its low dietary value and high calorie with salt or sugar [2]. It is very important to correct nutritional status during childhood because it will become hard during adolescence since they do not comply with dietary change recommendations [4].

Educational intervention can cause significant changes in students' attitude [2]. Unfortunately most educator-led school based intervention has been ineffective at reducing health problems [10]. One of the effective ways of attaining educational goals is benefitting from children as teachers [1]. Educated and trained peers can communicate with the same age group in a way that health personnel, teachers and parents can not [2]. The child to child teaching approach was first introduced by David Morely in 1978 [10]. which emphasizes on child to child approach as one of the components of health promotion strategy [11]. School health based strategy started as an approach since 1990 and strongly supported by WHO ever since [11]. Study results conducted in Sanandaj city with child to child approach on dental health promotion indicated that peer-education group

was more effective than trainer education group in performance domain [10].

A child to child approach study in relation to health of elementary students in Canada showed no significant difference in younger students after intervention but it was significant in older children [12]. Other studies also found the effect of teaching in peer groups [13, 14]. But in peer group teaching on Tuberculosis in adolescents, educator to child teaching was more effective [15]. In attention to controversial results regarding the effect of child to child teaching, the present study aimed to determine the effect of child to child teaching approach in comparison to health educator to child teaching approach on nutritional status in elementary school students. The study results may help authorities to plan to benefit from childrens' participation in teaching, especially nutritional status in schools and take a step for children's health promotion.

Materials and Methods

This is an educational trial study samples included 452 nine to eleven year old girls and boys from third, fourth and fifth grades from private and public schools of districts 1 and 2 in Rasht city (3 schools from each district) were chosen by random-cluster sampling method. Students' food frequency condition was assessed by observational checklist and continued until sample size (204 students) with unfavorable food frequency achieved. Then the 204 students were divided into three child to child, health educators to child and control groups. The first two groups received teaching intervention and control group received no intervention. The entrance criteria included enrollment as student in 3rd, 4th and 5th elementary schools and lack of disease and those not willing to participate in study were excluded. Based on unfavorable food frequency report in both study groups (P2=58.3% and P1=74.6%) according to Mohamadi study [2]. with 95% assurance and 5% deviate, the sample size in each group was consisted of 68 students.

Data-collection tool consisted of two sections: demographic questionnaire (sample age, sex, grade, and parents' level of education, occupation, and number of children in family, number of rooms in house, child's pocket money per week, and child's view of his / her weight) and second section included observational checklist of food frequency. The number of primary sample size was used to determine the nutritional status before teaching intervention by completing 54 item of food frequency checklist with the supervision of researcher and teacher and three selected students from

Downloaded from hnmj.gums.ac.ir at 0:42 IRDT on Tuesday April 24th 2018 [DOI: 10.29252/hnmj.28.2.101]

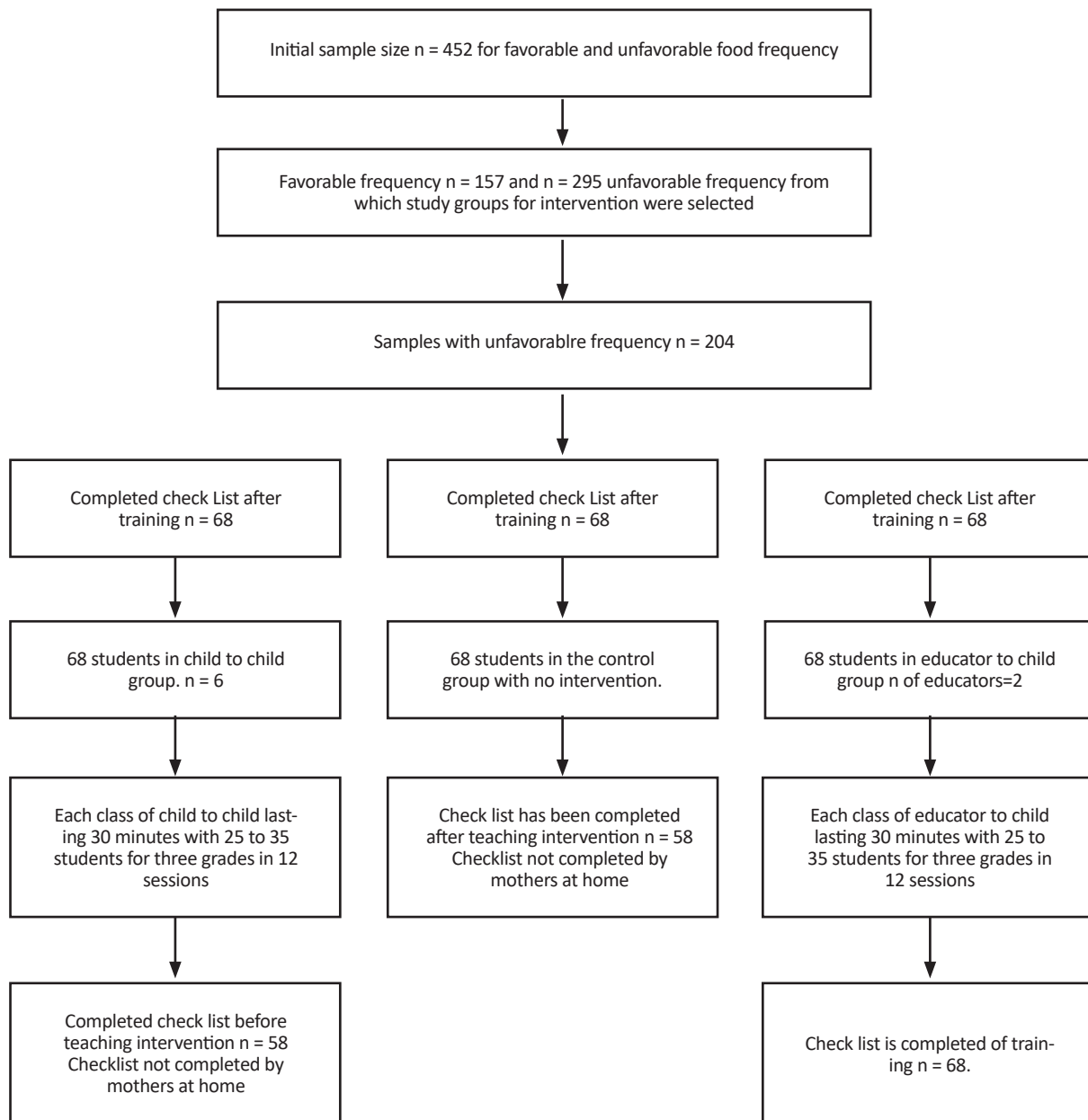


Figure 1. Three groups of players to child, child to child, and control the nutritional status of primary school children

each class during school hours for one week. The checklist was completed by mothers at home for snacks taken during evening and holidays for one week. The observational checklist based on Food Frequency Questionnaire (FFQ) which its psychometry was done in Iran [16] and then completed checklists by mothers and researcher were collected and scored by researcher to determine favorable and unfavorable food frequency. In checklist, items of authorized and unauthorized snack-foods with a variety of four main groups of food pyramid were listed. Students in case of consuming variety authorized snack-foods obtained 0.5 point and if the diversity of

snack-foods is not met or the students consume the unauthorized ones, obtained zero point. If samples use 28 authorized variety snacks or same valued nutritional snacks seven times or more during one week obtained satisfactory score of 14 and scores higher indicated favorable nutritional status and scores lower than 14 showed unfavorable nutritional status.

According to the score of food frequency, students were divided into two groups. First group consisted of students with favorable food frequency that did not enter in the educational intervention and second group

with unfavorable frequency were eligible for educational intervention. From primary sample chosen, 157 had favorable frequency and 295 had unfavorable frequency from which 204 students from selected schools were divided into three equal groups of 68 students in child-to-child teaching, educator to child and control group. Teaching intervention was conducted for educator to child and child-to-child group while control group received no intervention. After intervention, because of uncompleted check list by mothers at home, 6 students in child to child group and 10 students in control group were excluded. And 62 students in child to child and 58 in control group and 68 in educator to child group remained in the study (Figure 1).

Children from each grade were selected in attention to the highest score obtained on checklist and comments of school principles and finally six students with best rhetoric were chosen for child to child teaching. Teaching with coordination of school principals were conducted in mid hours for thirty minutes in three days in one of the classrooms of boys and girls schools separately using pamphlets, pictures, and posters. Training sessions included introducing food pyramid, importance of snacks and authorized and unauthorized snack-foods, micronutrient and its role in snacks and fruit festival (each student brought one or two fruit and shared it after playing and praying). Teachings were presented by educator to child and child to child (each student taught his level grade) separately for three sessions each lasting 30 minutes for three grade levels (Table 1). Time table of program included two weeks for the first step (finding problem), two weeks education, and three weeks for follow up and two weeks for gathering checklist after teaching intervention lasting from March to May in 2015. After completing teaching intervention and last

step observation checklist, the teaching booklets were given to the samples in control group.

After three weeks, the observation checklist was completed again by researcher in school and mothers at home and the score of food frequency computed and determined the favorable and unfavorable cut-off points. Before intervention, the normality was surveyed by Kolmogorov and Smirnov test and showed that nutrition score does not obey normal distribution and data obtained were analyzed by SPSS 20 and Chi-Square, Mann whitney and Kruskal Wallis tests. This research registered by IRCT N1 138706091126. Figure 1 runs in three groups of players to child, child to child, and control the nutritional status of primary school children.

Results

Findings indicated no significant difference between students' nutritional status and variables such as type of school (public or private), sex, father's job, parents' education, child's pocket money, number of rooms in the house, number of persons in the house in all three study groups. Study results showed that the nutritional status of 295 children (65.3%) was unfavorable. Findings showed significant difference between the three grade levels and students' nutritional status (P=0.007). In fact the favorable frequency of third grade was more than other grades. Children's nutritional frequency status before teaching intervention, based on mean score, was less than 14 and 100% of samples had unfavorable food frequency (Table 2).

Based on results, even though the comparison of mean score difference of nutritional status in all three groups was not significant (P=0.089) but the changes in mean score of nutritional status was significant (P=0.0001).

Table 1. An outline training related to training package to improve the nutritional status of child to child and educator to child.

Number of Meetings	Methods and Materials	Educational Content	Purpose of Meeting
1	Lecture, question and answer and displaying posters	- Knowledge of the food pyramid, the importance of eating and time-consuming - Snack, snack virtual snacks illegal	General Nutrition
2	Lecture, question and answer, showing pictures of chubby teen and snacks authorized and unauthorized	- The importance of food intake, diseases from consumption - Snack inappropriate	See a few examples The power to adjustment of status feeding
3	Celebrated actor and fruit	- Snack authorized and unauthorized	Learning in order to improve nutritional status

Table 2. Comparison of the mean score of nutritional status in three groups before the intervention (N=188)

Groups Training	Number	Mean±SD	Unfavorable Nutritional Status N (%)
Child to child	62	11.30±2.21	62(100)
Educator to child	68	12.85±1.61	68(100)
Control	58	12.81±0.088	58(100)

Table 3. Comparison of the average score of nutritional status in three groups after intervention

Groups Training	Number	Mean±SD	Changes Score Mean Score Before and After
Child to child	62	12.63±1.83	2.25±1.33
Educator to child	68	12.99±1.53	2.14±0.13
Control	58	12.16±2.04	1.90±0.65

*Kruskal Wallis test

The greatest change was in child to child teaching group and the least change was in control group (Table 3).

The mean score changes of nutritional status before and after teaching in child to child group in relation to educator to child group was significant (P=0.001) as child to child teaching group showed more teaching changes (1.19±0.37). The comparison of score changes in child to child and control group was statistically significant (P=0.0001) as child to child teaching group showed more teaching changes (1.98±0.39). The comparison of score changes in educator to child and control group was not statistically significant (P=0.179) and in comparison of three study groups as regard to changes in mean score of nutritional status before and after teaching, the child to child group was better than the other two groups.

Table 4 shows that from 62 study cases taught by child to child approach, 33.9% had favorable nutritional status after teaching, from 68 students in educator to child teaching group, 36.8% had satisfactory frequency and from 58 students in control group who received no teaching intervention, only 14.3 % (9 students) had favorable nutritional status. Based on results, score of students' favorable food frequency increased in all three groups and educator to child group was better than other two groups and it was statistically significant (P=0.014). While comparing the three groups regarding favorable frequency, the educator to child group was more successful (Table 5).

Discussion

Results indicates significant effect of teaching program on nutritional status of students in intervention group

Table 4. Nutritional status score changes in the three groups after intervention

Groups Training	Score Changes Before and After	Mean±SD*	Mean±SD**	Mean±SD***	Sig.****
Child to child	2.25±1.33				0.001
Educator to child	2.14±0.13	0.37±1.19	0.39±1.98	0.38±0.79	0.0001
Control	1.90±0.65				0.179

* SD.±the differences of mean score was a significant difference before and after levels 1 and 2.

** SD.±the differences of mean score was a significant difference before and after levels 1 and 3.

*** SD.±the differences of mean score was a significant difference before and after levels 2 and 3.

****Mann Whitney U Test

Table 5. Nutritional status in three groups after intervention (cut-off point)

Groups Training	Number	Score of Frequency After Intervention		Sig.
		Score of <14	Score of 14≤	
Child to child	62	41(66.1)	21(33.9)	0.014
Educator to child	68	43(63.2)	25(36.8)	
Control	58	49(85.07)	9(14.3)	
Total	188	133(71.0)	55(29)	

as compared to control group. In addition, most study cases had unfavorable nutritional status. This study finding is similar to some other studies on students' food frequency status in Iran [2, 17, 18]. Previous and present study results showed students' food frequency has unsatisfactory trend. In researcher viewpoint, students are using more low nutritional value snacks and parents are spending less time to prepare quality snacks due to their busy life.

Results showed statistical significant difference between the three school grades as regard to students' nutritional status, in fact the third grade students had more favorable food frequency than other grades. There was no significant difference between students' nutritional status and variables such as type of school, sex, father's job, and parents' education, amount of child's pocket money, number of rooms in the house and number of persons in the house.

Results of some studies indicate that with increase in BMI, child and adolescents' diet regime changes [19, 20]. Study results indicates more favorable food frequency in lower grades and unfavorable frequency in upper grades. It seems that after increase in age and BMI, changes in dietary regime is observed and as one nears puberty, food frequency gets more unfavorable.

There was significant difference in mean score changes of nutritional status before and after teaching in all three groups and least change was reported in control group that received no intervention. Study findings of Najar Lashkari on effect of child to child teaching health knowledge domain showed that the mean score of knowledge in intervention group of students increased [1]. In a study entitled "effect of peer teaching based on Health Belief Model on nutritional behavior of male elementary students" indicated that peer teaching significantly improved nutritional behavior of fourth grade students [13]. In attention to

the results of various studies based on child to child teaching approach, it is necessary to assess the effect of peer practice in different health fields in schools and therefore benefit from this vast potential in teaching with less cost in schools.

In comparison of child to child, educator to child and control groups, the mean nutrition score changes after intervention was statistically significant in child to child group and they had more educational changes than other two groups. Study conducted by Moeini showed significant mean change before and after intervention and in child to child group as compared to control group [10]. Baghian Moghadam study showed that peer teaching was more successful than other methods studied [14]. Other study reported the same results [21] but the result of Liu's study [15] had controversial results.

Of course as mentioned before present study found that the effect of educator to child teaching was more successful than child to child teaching on favorable nutritional status. It seems school health educators as trained adults have good effects on school health programs and their presence in school is justified. And it appears that assessing the effect of peer teaching as compared to school health educators needs more studies. In attention that students' family did not receive any teachings and this matter could effect child's snack nutrition status and also parents' emotional condition while completing observation checklist at home could effect the results which was out of researcher's control. Therefore it is suggested to compare the effect of family based teaching approach and peer teaching approach on students' nutritional status.

In conclusion, this study indicated that in achieving favorable food frequency, which was the main goal of the research, the educator group was more effective than peer group. But changes of nutritional behaviors in peer group was more successful than educator

group. Our results seem to confirm previous research findings of peer- led influences on health education. Limitation of the study, we need to evaluate in long length time after two month that summer holiday started and we could not evaluate nutritional behaviors' students in long length time.

Acknowledgments

This article is extracted from a MSc. thesis in Guilan university of Medical Sciences with 92237 ethics number, which is founded by Social Determinants of Health Resarch Center (SDHRC). The authors are grateful to all participants and teachers and managers and research and technology affairs Guilan University of Medical Sciences.

Conflict of Interest

No conflict of interest has been declared by the authors. All authors have agreed on the final version and meet at least one of the ICMJE authorship criteria, including substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data, drafting the article or revising it critically for important intellectual content.

References

- [1] Najjar Lashgari S, Rahim Aghaee F, Dehghan Nayeri N. [The effect of child to child education on health awareness of third grade female students in primary school (Persian)]. *Modern Care Journal*. 2013; 10(2):132-40.
- [2] Mohammadi Zeidi I, Pakpour A. [Effectiveness of educational intervention based on theory of planned behavior for promoting breakfast and healthy snack eating among elementary school students (Persian)]. *Razi Journal of Medical Sciences*. 2013; 20(112):67-78.
- [3] Mirzaei M, Karimi M. [Prevalence of overweight and obesity among the first grade primary students in Yazd (Persian)]. *Scientific Journal of Ilam University of Medical Sciences*. 2010; 18(4):43-9.
- [4] Amini K, Mojtahedi SY, Mousaiefard M. [Consumption of fruits, vegetables, dairy products and meat among high school students in Zanjan Province, Iran (Persian)]. *Journal of School of Public Health and Institute of Public Health Research*. 2009; 7(2):25-39.
- [5] Brouwer RJ, Neelon SE. Watch Me Grow: A garden-based pilot intervention to increase vegetable and fruit intake in preschoolers. *BMC Public Health*. 2013; 13(1):363. doi: 10.1186/1471-2458-13-363
- [6] Khadgawat R, Marwaha R, Garg M, Ramot R, Oberoi A, Sreenivas V et al. Impact of vitamin D fortified milk supplementation on vitamin D status of healthy school children aged 10–14 years. *Osteoporosis*

International. 2013;24(8):2335-43. doi: 10.1007/s00198-013-2306-9

- [7] Fesharaki M, Sahebozamani M, Rahimi R. [Investigate the effect of teaching on life style of over weight female elementary school students in Orumieh city (Persian)]. *Iranian Journal of Diabetes and Lipid Disorders*. 2011;9(3):290-5.
- [8] Kalantari N, Shenavar R, Rashidkhani B, Houshiar Rad A, Nasihatkon A, Abdollahzadeh M. [Association of overweight and obesity in first-year primary school children in Shiraz with breastfeeding pattern, birth weight, and family socio-economic status in school year 2008-09 (Persian)]. *Iranian Journal of Nutrition Sciences & Food Technology*. 2011; 5(3):19-28.
- [9] Amini M, Dadkhah-Piraghaj M, Abtahi M, Abdollahi M, Houshiar-rad A, Kimiagar M. Nutritional assessment for primary school children in Tehran: an evaluation of dietary pattern with emphasis on snacks and meals consumption. *International Journal of Preventive Medicine*. 2014; 5(5):611-6. PMID: 24932393
- [10] Moeini B, GHaderi A, Hazavehe M, Allahverdi H, Moghaddam A, Jalilian F. [A comparative study of peer education and trainer education on the Basis of Health Belief model (HBM) in improving oval Health in Sannandaj Boys elementary schools (Persian)]. *toloo-e-behdasht*. 2013; 12(2):1-13.
- [11] Wang D, Stewart D. The implementation and effectiveness of school-based nutrition promotion programmes using a health-promoting schools approach: A systematic review. *Public Health Nutrition*. 2013; 16(06):1082-100. doi: 10.1017/s1368980012003497
- [12] Santos RG, Durksen A, Rabbani R, Chanoine JP, Miln AL, Mayer T, McGavock JM. Effectiveness of peer-based healthy living lesson plans on anthropometric measures and physical activity in elementary school students: A cluster randomized trial. *JAMA pediatrics*. 2014; 168(4):330-7. doi: 10.1001/jamapediatrics.2013.3688
- [13] Mainbolagh BL, Rakhshani F, Zareban I, Montazerifar F, Sivaki HA, Parvizi Z. [The effect of peer education based on health belief model on nutrition behaviors in primary school boys (Persian)]. *Journal of Research & Health*. 2012; 2(2):214-25.
- [14] Baghiani Moghadam MH, Forghani H, Zolghadr R, Rahaei Z, Khani P. [Peer-led versus teacher-led AIDS education for female high-school students in Yazd, Islamic Republic of Iran (Persian)]. *Eastern Mediterranean Health Journal*. 2012; 18(4):353-7. PMID: 22768697
- [15] Liu Q, Liu L, Vu H, Liu X, Tang S, Wang H. Comparison between peer-led and teacher-led education in tuberculosis prevention in rural middle schools in Chongqing, China. *Asia Pacific Journal of Public Health*. 2013; 27(2):NP2101–NP2111. doi: 10.1177/1010539513498767
- [16] Esfahani FH, Asghari G, Mirmiran P, Azizi F. [Reproducibility and relative validity of food group intake in a food frequency questionnaire developed for the Tehran Lipid and Glucose Study (Persian)]. *Journal of Epidemiology*. 2010; 20(2):150-8.
- [17] Soheili Azad A, Nourjah N, Norouzi F. [Survey the eating pattern between elementary students in Langrood (Persian)]. *Journal of Guilan University of Medical Sciences*. 2007; 16(62):36-41.
- [18] Soheili Azad A, Nourjah N, Aalamdar E. [Surveying the food intake of primary school students in Tehran (Persian)]. *Research in Medicine*. 2005; 29(2):165-8.
- [19] Karimi A, Shojaezadeh D, Majdzadeh R, Rashidian A, Omidvar N. [Application of an integrative approach to identify determinants of junk food consumption among female adolescents (Persian)].

Iranian Journal of Nutrition Sciences & Food Technology. 2009; 4(2):61-70.

- [20] Dahri M, Safarian M, Hajyfarajy M, Hoshyarrad A, Abadi A. [The association of overweight and obesity with menarche age and nutritional status in girls aged 11-15 in Mashhad (Persian)]. Medical Journal of Mashhad University of Medical Sciences. 2011 ; 53(4):245-53.
- [21] Ayaz S, Açıl D. Comparison of Peer Education and the Classic Training Method for School Aged Children Regarding Smoking and its Dangers. Journal of Pediatric Nursing. 2015; 30(3):e3–e12. doi: 10.1016/j.pedn.2014.11.009