

Personal Hygiene Components in Iranian Children and Adolescent Magazines

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Abstract

Background: The health of children and adolescents has been one of the main concerns of parents and teachers. Today, magazines are taken into account as useful tools for training these vulnerable groups.

Objectives: The aim of this study was to analyze the health contents of children and adolescent magazines during years 2013 to 2014.

Materials and Methods: This was an applied research and the method was content analysis. The analysis unit was page (text and image) of all children and adolescent magazines published during years 2013 and 2014 in Iran. The research was done based on Shannon entropy. The validity of the data-gathering tool was confirmed by experts in health education. Test-retest was used to determine the reliability of the tool and the correlation coefficient was 0.84.

Results: In the mentioned magazines, most attention was towards nutrition components with 0.139 importance coefficient and sports and physical activity with 0.123 importance coefficient. While the least attention was devoted to puberty health component with 0.078 importance coefficient and smoking and drugs with 0.082 importance coefficient.

Conclusions: Regarding the important role of magazines in preparing children and adolescences to have a healthy and happy life, it seems that despite their success in some areas, magazines couldn't help them in some categories such as puberty and addiction.

Keywords: Child Health Services, Adolescent Health Services, Publications, Hygiene

1. Background

Health is a state of balance between a human being and his/her physical, emotional and social environment. It has a very important role in everyday life, so that it is said, "If health is not everything, everything is nothing without health" (1). All countries consider all groups of the population in order to achieve health. Children and adolescents need special emphasis among these groups (2). Poor health among school children is due to the lack of awareness of the health benefits of personal hygiene. Diarrheal diseases, skin diseases, worm infestations and dental diseases are most commonly associated with poor personal hygiene (3). The importance of providing health education to children is that they are at an early stage in their health development (4). This age group undergoes many physical and psychological changes during their normal growth. Thus they need a continuous assessment of their physical, psychological, intellectual, emotional and social health. Also the large percentage of children and adolescents means they should be prioritized when it comes to

receiving health services (5). Therefore, considering their state of health is important and will prevent other problems.

Continuous training is necessary for understanding and implementing a correct life style. "Personal hygiene education" is part of this training, which motivates and changes behavior in order to live healthy (1). "Personal hygiene" is the hygienic actions, which should be done by each individual, to provide and maintain physical, psychological and social health (6). On the other hand, social media plays an important role in personal hygiene education. After parents and school, they are responsible to inform children (7). There are many researches about the positive effects of education in improving personal hygiene, especially for children (4, 8-10).

Skill-based health education is more effective when it is taught as part of a comprehensive approach to school health than in isolation (11). There is evidence that parents seek parenting advice from media sources (12). Printed media have a special place in education systems among various media due to their ability to create a reading habit that

satisfies children's curiosity (13). Amongst printed media, magazines are more interesting for children because of their variability and availability, and so they have a greater chance to be read. Magazines can play an important role in health education and health promotion during childhood and later. Children, who live in villages and have no access or limited access to electronic media, are more likely to buy printed magazines. This is a good opportunity for improving personal hygiene education.

Despite this important subject that considering the education and health of children and adolescents today, can guarantee health society in future and personal hygiene education and increasing health knowledge are the most effective methods to prevent or reduce many of the problems in the field of health (14), unfortunately there are a few researches for analyzing different media based on health issues. Some of them are introduced below.

Sukumaran conducted a study to examine the nature, content, and duration of advertisements broadcasted during children's television programs. The findings showed, amongst a total of 128 hours of television programs recorded, advertising accounted for 10.15% (13.01 hours). The advertisement of sugar-rich food products, non-food and oral hygiene products made up 50.36%, 38.41% and 1.90%, respectively, of the total advertising time. Also it was concluded that the advertising of sugar-rich foods, particularly solid and sticky food products, was broadcasted more in one of the television channels, during school holidays and during prime time (15).

Ostry et al. studied the most popular websites and their results showed that the quality of nutritional recommendations in non-commercial websites was much better than the quality of commercial ones (16).

Jones et al. conducted a study on the advertisements of magazines and found that food manufacturers provided most of the health ads, and a few of them were non-commercial. In general, many concerns about the low nutritional value of foods were expressed (17).

Maheshwar and Rao, after comparing newspapers in English and Telugu-language, showed that English newspapers paid more attention to obesity, beverage and chocolates and Telugu newspapers to traditional foods and promotion of the use of natural foods (18).

Yoo and Kim, after analyzing of 417 obesity videos, revealed that a newer medium like YouTube, similar to traditional media, appeared to assign responsibility and solutions for obesity mainly to individuals and their behaviors, although there was a tendency for some video categories to show other causal claims or solutions (19).

Friedman et al. analyzed the cognitive health content of 20 most circulated United States magazines. Diet was the greatest focus. Physical activity coverage was lim-

ited. Important behavior-related cognitive health risks, including hypertension and diabetes, were not mentioned. Coverage of cognitive health was not commensurate with growing evidence that health behaviors may help to maintain it (20).

No et al. in a survey titled "Food references and marketing in popular magazines for children and adolescents in New Zealand" analyzed the contents of five magazines with the highest number of readers amongst 10 to 17-year-olds over a one-year period (December 2012-January 2014). They concluded that magazines targeted at children and adolescents contained a significantly higher proportion of unhealthy branded food references ($n = 51.71$, 72%) while vegetables and fruits were marketed the least frequently ($n = 9.3\%$). Researchers believe this raises concerns about the effectiveness of self-regulation in marketing and emphasizes that government regulations should be more careful about children's current potential high exposure to unhealthy food marketing. In addition, magazine editors could take socially responsible editorial positions in regards to healthy eating (21).

Kalin conducted a research to identify, quantify and compare strategies for child obesity prevention and control presented in mainstream and Spanish-language US parenting magazines. Child obesity-related editorial content in 68 mainstream and 20 Spanish-language magazine issues published over 32 months was gathered. Child obesity-focused articles were not given high prominence; only one in four articles in the entire sample referred to child obesity as a growing problem or epidemic (12).

Nonaka et al. analyzed the contents of primary and secondary school textbooks regarding malaria control. They collected textbooks that were used by children in grades one to nine from nine countries endemic for malaria. Of a total of 474 collected textbooks, 35 contained descriptions about malaria. Very few textbooks included content that facilitated prompt treatment, protection of risk groups, and use of recommended therapy (22).

Paek et al. in a study examined frequencies and types of promotion techniques featured during five decades of cigarette advertising relative to five major smoking eras. "The increased use of sponsorships/events in cigarette ads for youth-oriented brands warrants more attention from tobacco control experts and government regulators (23).

Manganello et al. studied food advertisements appearing in parenting magazines. They identified 476 food ads, which represented approximately 32% of all ads in the magazine sample. Snack foods (13%) were the most frequently observed food ads, followed by dairy products (7%). They also found that over half ($n = 405$, 55.9%) of the advertised products ($n = 725$) were products of poor nutritional quality based on total fat, saturated fat, sodium, protein,

sugar and fiber content (24).

Studies conducted in the area of health, showed that the main topic of the research literature and media have considered adults, except for a few studies that examined children's books. Children and adolescents' magazines need to be analyzed. Personal health education should start early during childhood because it is the most significant time for the formation of many behaviors. Since informal education is much more effective and constant than formal education, entertaining publications play an important role in educating people especially children and adolescences.

2. Objectives

The aim of this study was to analyze the content of children and adolescent magazines published during 2012 and 2013 in terms of attention to personal health issues.

3. Materials and Methods

This was an applied research using the quantitative content analysis method. The analysis unit was the pages of magazines, which included all of the content (story, poem, image and so on). All children and adolescent magazines published during 2012 and 2013 in the country were analyzed. Due to the nature of the study and limited population, all the population was studied in order to achieve accurate and reliable data. Only one title was published weekly and the others were published monthly so one of four issues of the mentioned magazine was randomly selected in order to equalize the number of copies of magazines.

The content of all pages of magazines such as stories, poems, pictures and so on was analyzed according to 10 components of personal hygiene. As the common method of data analysis (i.e. frequency percentage) has special mathematical problems, Shannon entropy was used for data analysis in this study. In this method, which comes from systems theory, data analysis is much stronger and more reliable. Contents of magazines were categorized based on 11 respondents (Arosak-e sokhango, Salam bacheha, Baran, Poopak, Pooyandegan, Keyhan bacheha, Nabat koochooloo, Roshd-e nouamooz, Roshd-e nojavan) and 10 components of purpose (personal health components). At first, the message was counted in terms of items for each respondent in frequency form and the following stages were done based on the frequency table data:

- First stage: Matrix of frequency table should be normalized and this relationship was used (Equation 1):

$$P_v = \frac{F_v}{\sum_{i=1}^m F_v} \quad (i = 1, 2, \dots, m; j = 1, 2, \dots, n) \quad (1)$$

P = normalized frequency matrix; F = item frequency; I = Respondent no.; j = item number, m = number of respondents.

- Second stage: Information load of each item is calculated and placed in each column and the following equation was applied (Equations 2 and 3).

$$E_i = -K \sum_{i=1}^m [p_{ij} L_n P_{ij}] \quad (j = 1, 2, \dots, n) \quad (2)$$

$$K = \frac{1}{\ln m} \quad (3)$$

P = matrix normalized; J = (1, 2, ..., n) = logarithm; j = item number; I = respondent No., m = The number of respondents.

- Third stage: By information load of items (I = 1, 2, ..., n), importance coefficient of each of the items was calculated and each item with a greater information load had a greater importance (W_j) degree and to calculate importance coefficient, the following equation was used (Equation 4):

$$W_j = \frac{E_j}{\sum_{j=1}^n E_j} \quad (4)$$

W_j = importance degree; E_j = Information load of each item; n = the number of items; j = item No. (25).

Personal health elements were extracted from related researches and were confirmed by experts in the field of health education in order to determine the validity of the measuring tool. The test-retest method was used for the assessment of the measuring tool. Thus the correlation coefficient was determined as 0.84 among counted frequencies after reading some magazines with an interval of two weeks.

The most important limitation of the present study was studying magazines that were published for both children and adolescents. Therefore, despite the differences in the health needs of children and adolescents, they were not differentiated.

4. Results

In this section, the results of content analysis of magazines are expressed based on Shannon entropy. First the frequency of ten personal hygiene components in children

Table 1. Frequently Distribution of Personal Health Components in Children and Adolescent Magazines

	Shahed Nojavan	Roshd Daneshamoz	Roshd Nojavan	Roshd Noamooz	Nabat Kocholo	Keyhan Bacheha	Pooyandgan	Poopak	Baran	Salam Bacheha	Arosak Sokhango
Skin, hair and nail health	9	20	7	4	9	22	21	16	15	39	33
Mouth and teeth health	2	8	0	5	1	13	10	16	10	5	9
Exercise and sport	50	22	20	19	12	54	46	28	10	24	20
Nutrition	5	30	22	50	1	39	71	68	37	58	66
Disease	7	16	3	4	16	13	15	30	19	27	5
Cigarette and drugs	1	5	2	0	0	0	0	1	2	6	11
Body physical problems	1	7	2	7	2	11	4	13	4	6	8
Eye and Refractive problems	0	2	2	6	0	2	10	2	7	1	0
Technology	0	0	1	0	0	3	15	4	7	10	8
Puberty health	1	0	1	0	0	0	4	0	2	5	1

and adolescent magazines were counted and presented in Table 1.

As observed in Table 1, from a total of 1366 health messages, 195 messages were related to component of skin, hair and nails, 77 messages to oral and teeth, 305 messages to sports and physical activity, 447 messages to nutrition, 155 messages to diseases, 28 messages smoking, and drugs, 65 messages to body physical problems (ergonomics), 32 messages to eye and vision problems, 48 messages to technology, and 14 messages to puberty health.

Table 2 presents the information load values and the importance coefficient of personal health components in magazines.

Table 2. The Information Load Values and The Importance Coefficient of Personal Health Components in Children and Adolescent Magazines

Components	EJ	WJ
Skin, hair and nail health	0.742	0.109
Mouth and teeth health	0.643	0.094
Exercise and sport	0.834	0.123
Nutrition	0.943	0.139
Disease	0.723	0.106
Cigarette and drugs	0.560	0.082
Body physical problems	0.632	0.093
Eye and Refractive problems	0.579	0.085
Technology	0.584	0.086
Puberty health	0.534	0.078

As indicated, the greatest interest was towards nutrition components with an information load factor of 0.943

and importance coefficient of 0.139, and sport and physical activity with information load factor of 0.834 and importance coefficient of 0.123, respectively, While the lowest interest was towards puberty with information load factor of 0.534 and importance coefficient of 0.078 and smoking and drugs with an information load factor of 0.560 and importance coefficient of 0.082, respectively.

Table 3 presents the information load and the importance coefficient of children's magazines in terms of personal hygiene.

Table 3. The Information Load Values and the Importance Coefficient of Children and Adolescent Magazines in Terms of Personal Health Components

Magazines	EJ	WJ
Arosak-e sokhangoo	0.78	0.124
Salam bacheha	0.71	0.113
Baran	0.68	0.108
Poopak	0.59	0.094
Pooyandegan	0.57	0.091
Keyhan bacheha	0.54	0.086
Nabat koochooloo	0.52	0.083
Roshd-e nouamooz	0.51	0.081
Roshd-e nojavan	0.49	0.078
Roshd-e danesh amooz	0.47	0.075
Shahed-e nojavan	0.39	0.062

Obviously, amongst 11 magazines, those with the greatest coverage of different components were "Arosak-e sokhangoo" with information load of 0.78 and importance coefficient of 0.124, and "Salam bacheha" with informa-

tion load of 0.71 and the importance coefficient of 0.113. While the least coverage of components were observed in “Shahed-e nojavan” with information load of 0.39 and the importance coefficient of 0.062 and “Roshd-e danesh amooz” with information load of 0.47 and the importance coefficient of 0.075, respectively.

5. Discussion

According to the world health assembly statement entitled “Health for All”, the main social target of governments was to provide a level of health to all people in all countries that lead to a useful social and economic life. In addition to the overall responsibility of governments for public health, the role of intervention of individuals, families and other sectors of society such as the media is undeniable for improving public health. On the other hand, proper growth and development of children and adolescents and establishing appropriate health behaviors for them, guarantees maximum healthy survival and development of active social forces that would enable communities to flourish. This study was done to analyze the content of children’s magazines based on personal health factors. The results showed that both nutrition and physical activity have been considered more than other categories in all magazines. The results are consistent with some other researches (15, 16). There is no doubt that attention to feeding children is a paramount priority because of the importance of childhood years in shaping eating habits. Fast foods can be the most important factor in increasing disease in developing countries. However, despite the appearance and taste of fast foods, they cause a number of diseases such as obesity, cardiovascular disease, diabetes, gastrointestinal disease, hypertension and hyperlipidemia and so on. The development of industrial and automotive life causes an increased consumption of fatty fried foods and various physical and mental diseases (26).

Among different age groups, the most vulnerable target groups are children and adolescents, because the pressures of advertising by fast food centers and other suppliers are considerably attractive for them. Adolescence is amongst the most important stages of life due to rapid growth and maturation, during which nutritional and lifestyle habits are formed (27). In addition, factors such as living in small apartments, limited playground for children, increasing influence of technology and computer games, watching television, and ... lead them to inactivity and lack of enough physical activities (28). Sports also have other benefits for children and adolescents on the development of their personality. It can largely cause them to avoid moral and social problems such as addiction. It seems that

children and adolescent magazines have done their job regarding this issue as one of the informal channels of health education.

The findings showed that magazines pay less attention to the puberty category and also to smoking and drugs than other categories. These results are similar to the results of Izadi’s research (29). Undoubtedly, one of the most important stages of a human being’s life is puberty. We can say that this is the time of rapid changes in their body and social attitudes. Puberty is a period of spiritual, physical, mental, emotional and social growth, during which the personality of an individual develops and becomes stable (30). Lack of knowledge of young people about this age can lead them to fear, sadness and even depression. Therefore, it is necessary to inform them directly or indirectly. The results indicate a kind of inadvertence about these important issues in children and adolescent magazines like the findings of Izadi’s paper (29).

Today, smoking and drug addiction is a major problem in many countries of the world and, unfortunately, every day we see these problems in younger age groups. Addiction has both harmful effects on individuals and many negative consequences and costs for the family and society (31). So there are a lot of efforts to prevent addiction in different countries. One of the major challenges that young people face is the risk of initiating substance use, which is especially high at this age. Understanding the mechanism of substance abuse development in young people may provide a starting point for understanding the nature of addiction (32). The first step to prevent it, is to increase awareness and eliminate risk factors. In the meantime, various media including print and electronic media can play an important role in the prevention of this devastating phenomenon by providing necessary knowledge. Unfortunately, the results revealed that magazines have failed to do this vital duty.

In general, regarding the important mission of children and adolescents’ magazines in preparation of audiences to enjoy a healthy and happy life, the findings of this study showed that despite successes in some areas, yet in some categories, such as issues related to puberty and drugs, the magazines have failed to help their readers. Some of the more important suggestions of this research are: considering feedback of health and nutrition experts, doing some scientific needs assessments, and scientific content analysis on other informal media. Also it is necessary for health education authorities to publish a special magazine for children and adolescents’ health.

Today, mass media, including magazines play a role far beyond entertainment. Therefore, their major role in education cannot be ignored. Since teaching, guidance, social awareness and social skills promotion are the most im-

portant tasks of today's media such as children and adolescents magazines, it is expected that they publish papers and issues in order to improve physical, mental and emotional health in children and adolescents. These can be done by different ways for example considering experts' ideas, scientific polls and conducting content analysis on informal media. This way they can promote individual's well-being.

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Footnote

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References

- Kavian MLF, Rahimi Moaghar A, Hosseini M, Goldian J, Tehrani A. Preventive health education and the media. *Iran Pak*. 2009;**26**:21-8.
- Sharifnia H, Hojati H, Sharifnia M. The role of pre primary school education on health awareness of first grade students. *J Urmia Nurs Midwifery Faculty*. 2011;**9**(2).
- Sarkar M. Personal hygiene among primary school children living in a slum of Kolkata, India. *J Prevent Med Hygiene*. 2013;**54**(3):153.
- Habbu SG, Krishnappa P. Effectiveness of oral health education in children - a systematic review of current evidence (2005-2011). *Int Dent J*. 2015;**65**(2):57-64. doi: [10.1111/idj.12137](https://doi.org/10.1111/idj.12137). [PubMed: [25345565](https://pubmed.ncbi.nlm.nih.gov/25345565/)].
- Mahmodifar YKZ, Rezvani P, Salehi K. Role and position of nurses in the school health program in Iran. *Homa-ye-Salamat*. 2010;**33**:27-31.
- Helmsresht PDI, Mostajeran A. Glossary of Health Sciences Terms. Tehran: Chehr; 2003.
- Khaniki H, Rassi Tehrani H. The study of audience's point of view about health messages of TV. *Culture Commun Stud*. 2011;**3**(12):151-87.
- Arunakul M, Asvanund Y, Tantakul A, Mitrakul K, Srisatjaluk R, Vongsavan K. Effectiveness of an Oral Hygiene Education Program Combined with Fluoride Mouthrinse among Visually Impaired Students in Bangkok, Thailand. *Southeast Asian J Trop Med Public Health*. 2015;**46**(2):354-9. [PubMed: [26513939](https://pubmed.ncbi.nlm.nih.gov/26513939/)].
- Mereu A, Sotgiu A, Buja A, Casuccio A, Ceconi R, Fabiani L, et al. Professional competencies in health promotion and public health: what is common and what is specific? Review of the European debate and perspectives for professional development. *Epidemiol Prev*. 2015;**39**(4 Suppl 1):33-8. [PubMed: [26499413](https://pubmed.ncbi.nlm.nih.gov/26499413/)].
- Upashe SP, Tekelab T, Mekonnen J. Assessment of knowledge and practice of menstrual hygiene among high school girls in Western Ethiopia. *BMC Womens Health*. 2015;**15**:84. doi: [10.1186/s12905-015-0245-7](https://doi.org/10.1186/s12905-015-0245-7). [PubMed: [26466992](https://pubmed.ncbi.nlm.nih.gov/26466992/)].
- World Health Organization. Understanding Skills-Based Health. Education & Life Skills. Geneva: WHO Information Series on School Health; 2003.
- Kalin SR, Fung TT. Comparison of child obesity prevention and control content in mainstream and Spanish-language US parenting magazines. *J Acad Nutr Diet*. 2013;**13**(1):133-40. doi: [10.1016/j.jand.2012.09.023](https://doi.org/10.1016/j.jand.2012.09.023). [PubMed: [23260730](https://pubmed.ncbi.nlm.nih.gov/23260730/)].
- Kazemi B. Investigation and analysis of psychological concepts of non-school books for children (from the collection of Institute for the Intellectual Development of Children & Young Adults). Tehran: Al-lameh Tabatabai University; 1994.
- Atashnafs AKS, Dostmohammadi GH. Examine ways of improving the health of students in Semnan: 2003. *Razehzistan*. 2005;**8**:11-34.
- Sukumaran A, Diwakar MP, Shastry SM. A content analysis of advertisements related to oral health in children's Tamil television channels—a preliminary report. *Int J Paediatr Dent*. 2012;**22**(3):232-8. doi: [10.1111/j.1365-263X.2011.01187.x](https://doi.org/10.1111/j.1365-263X.2011.01187.x). [PubMed: [21972943](https://pubmed.ncbi.nlm.nih.gov/21972943/)].
- Ostry A, Young ML, Hughes M. The quality of nutritional information available on popular websites: a content analysis. *Health Educ Res*. 2008;**23**(4):648-55. doi: [10.1093/her/cym050](https://doi.org/10.1093/her/cym050). [PubMed: [17897928](https://pubmed.ncbi.nlm.nih.gov/17897928/)].
- Jones SC, Andrews KL, Tapsell L, Williams P, McVie D. The extent and nature of "health messages" in magazine food advertising in Australia. *Asia Pac J Clin Nutr*. 2008;**17**(2):317-24. [PubMed: [18586654](https://pubmed.ncbi.nlm.nih.gov/18586654/)].
- Maheshwar M, Rao RD. A comparative analysis of nutrition science coverage by popular Indian daily newspapers. *J Media Commun Stud*. 2011;**3**(4):131.
- Yoo JH, Kim J. Obesity in the new media: a content analysis of obesity videos on YouTube. *Health Commun*. 2012;**27**(1):86-97. doi: [10.1080/10410236.2011.569003](https://doi.org/10.1080/10410236.2011.569003). [PubMed: [21809934](https://pubmed.ncbi.nlm.nih.gov/21809934/)].
- Friedman DB, Laditka SB, Laditka JN, Price AE. A content analysis of cognitive health promotion in popular magazines. *Int J Aging Hum Dev*. 2011;**73**(3):253-81. [PubMed: [22272508](https://pubmed.ncbi.nlm.nih.gov/22272508/)].
- No E, Kelly B, Devi A, Swinburn B, Vandevijvere S. Food references and marketing in popular magazines for children and adolescents in New Zealand: a content analysis. *Appetite*. 2014;**83**:75-81. doi: [10.1016/j.appet.2014.08.013](https://doi.org/10.1016/j.appet.2014.08.013). [PubMed: [25128834](https://pubmed.ncbi.nlm.nih.gov/25128834/)].
- Nonaka D, Jimba M, Mizoue T, Kobayashi J, Yasuoka J, Ayi I, et al. Content analysis of primary and secondary school textbooks regarding malaria control: a multi-country study. *PLoS One*. 2012;**7**(5):e36629. doi: [10.1371/journal.pone.0036629](https://doi.org/10.1371/journal.pone.0036629). [PubMed: [22574203](https://pubmed.ncbi.nlm.nih.gov/22574203/)].
- Paek HJ, Reid LN, Jeong HJ, Choi H, Krugman D. Five decades of promotion techniques in cigarette advertising: a longitudinal content analysis. *Health Mark Q*. 2012;**29**(1):1-17. doi: [10.1080/07359683.2011.623087](https://doi.org/10.1080/07359683.2011.623087). [PubMed: [22416922](https://pubmed.ncbi.nlm.nih.gov/22416922/)].
- Manganello JA, Clegg Smith K, Sudakow K, Summers AC. A content analysis of food advertisements appearing in parenting magazines. *Public Health Nutr*. 2013;**16**(12):2188-96. doi: [10.1017/S1368980012005216](https://doi.org/10.1017/S1368980012005216). [PubMed: [23217222](https://pubmed.ncbi.nlm.nih.gov/23217222/)].
- Shannon CE. A mathematical theory of communication. *ACM SIGMOBILE Mobile Comput Commun Rev*. 2001;**5**(1):3-55.
- Pouretedal Z, Salek-Zamani SH, Vahidkia N, Ebrahimi-Mamaghani M. Changing the food style consumption of female and male students of Tabriz University After entrance to University. *Med J Tabriz*. 2008;**30**(1):25-32.
- Hossieni M, Fallah H, Keshavarz SA. Comparison of nutritional status and related factors among pupils aged 11-14 year olds in public and private schools of Damghan (2005). *Koomesh*. 2007;**8**(2):53-60.
- Izadi S, Abedini Baltarak M, Mansouri S. Content analysis of physical activities issues in Primary School Textbooks. *J Sport Manag Act Behav*. 2011;**7**(1):27-40.

29. Izadi S, Salehi E, Fathi K, Abedini M. Analysis of primary school textbooks based on the components of health education. *J Educ Innovat.* 2010;**9**(1):139–62.
30. Mohammadzadeh Z, Allame Z, Shahrokhi S, Oreyzi HR, Marasi MR. Puberty health education in Iranian teenagers: Self-learning or lecture and discussion panel?. *Iran J Med Educ.* 2002;**1**(3):3–6.
31. Jahantab M. Unsuitable friends and teenagers addiction. *Soc Health Addict.* 2015;**1**(4):63–78.
32. el-Guebaly N, Carra G, Galanter M. Textbook of Addiction Treatment: International Perspectives. Italia: Verlag; 2015.