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# Strategies to non communicable diseases prevention improvement from the viewpoints of students in Isfahan: A qualitative research

Zohreh Hamedani, Fariba Haghani<sup>1</sup>, Roya Kelishadi<sup>2</sup>

## Abstract

**BACKGROUND AND AIM:** Full health is one of the basic human rights and requires a healthy lifestyle. Public continuous education, especially among the students who are a great target group and the future of the country, is the best way to modify lifestyle. Therefore, the present study was conducted with the aim of analyzing the factors affecting the prevention of non communicable diseases from students' viewpoints in Isfahan in the academic year of 2016–2017.

**METHODS:** This study was carried out through the qualitative approach and conventional content analysis method. Participants included 27 students who were selected by convenient and purposeful sampling method with maximum variation. Method of data collection was semi structured interviews with sound recordings with note-taking, and data analysis method was inductive content analysis.

**RESULTS:** After removing repetitive codes and merging the similar ones, 1237 codes were obtained from interviews that were placed in 7 main categories and 18 subcategories. The main categories included "grand health policy-makings," "the role of the educational system in promoting health," "schools and healthy nutrition models," "schools and sports and physical activity development," "informal learning," "preventive strategies in health promotion," and "lifestyle modification."

**CONCLUSION:** It seems that controlling and improving the factors affecting lifestyle and making school education more effective are the main factors that influence the efficacy of preventive educational programs of non communicable diseases.

## Keywords:

Educational efficacy, lifestyle, non communicable diseases

Department of Educational Sciences, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran, <sup>1</sup>Department of Medical Education, Medical Education Research Center, Isfahan University of Medical Sciences, <sup>2</sup>Children Growth and Development Research Center, Non communicable Diseases Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

## Address for correspondence:

Dr. Fariba Haghani, Isfahan University of Medical Sciences, Isfahan, Iran. E-mail: [F.haghani@gmail.com](mailto:F.haghani@gmail.com)

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## Introduction

In this research, among the various types of non communicable diseases, four diseases that have a higher global and national prevalence and mortality rates, as well as a higher financial burden for their control and treatment in different societies were studied.

The main purpose of development at different levels is to improve the quality of life. Health is one of the pillars of sustainable development and its inseparable part in improving quality of life.<sup>[1]</sup> The progress of

science and technology, the development of mechanical life, and the transformation of lifestyle from traditional to modern have changed the way in which health is provided and regulated.<sup>[2]</sup> Evidence suggests that more than a third of all deaths in the world are due to health-threatening behaviors including inappropriate diet, inadequate physical activity, and smoking, resulting from the incorrect personal and social lifestyles.<sup>[3]</sup> Inappropriate lifestyle is also one of the most important factors in the emergence of non communicable diseases including cancer, chronic pulmonary,

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cardiovascular, and some other diseases. Accordingly, inappropriate life-style has made fundamental changes in individuals' health and has put communities at the risk of epidemics of non communicable diseases. Hence, the first and most important action is to improve the personal and social lifestyle in order to prevent non communicable diseases.

One of the prerequisites for lifestyle modification is having targeted programs to raise the level of awareness and knowledge, related to personal and social health, and prevention of non communicable diseases. Setting goals for and implementation of these programs should be such that, in addition to raising awareness, it can improve the individuals' practice.<sup>[4]</sup> Studies have shown that individuals' health information is effective on their behaviors. In other words, one of the essential elements for the prevention of non communicable diseases and the promotion of health is increasing the public knowledge concerning relevant issues<sup>[5-7]</sup> as well as the elimination of individuals' poverty of the awareness, related to health and prevention of non communicable diseases such as cancer.<sup>[8]</sup> Other research results suggest that awareness, beliefs and proper nutrition behaviors can affect health and reduce the effects of diseases.<sup>[8-10]</sup> Furthermore, research shows that the most effective and practical method of teaching healthy lifestyles to the adolescents is "direct education with no mediation."<sup>[11]</sup> In other words, educational intervention can lead to individuals' attitude and practice improvements.<sup>[12]</sup> In this regard, the use of various sources (such as radio and television, the Internet, friends and relatives, newspapers, journals, and magazines) can lead to an increase in individuals' health information.<sup>[13]</sup>

Some research suggests that addressee groups consider great importance for their interpersonal communication and count on that as a complement for TV health messages<sup>[2]</sup>. With regard to promotion of awareness and making a health belief in individuals, in addition to conducting health focused research, the implementation of preventive educational plans and programs plays an important role and can lead to lifestyle modification in individuals. Among the health plans and preventive programs for non communicable diseases that have been implemented at national and regional levels in Iran over the past two decades are healthy heart promotion from Childhood project,<sup>[14]</sup> project of the young: National healthy heart in Isfahan,<sup>[15]</sup> and primary schools healthy heart project in Shahrekord.<sup>[16]</sup> However, despite the implementation of these plans and programs, the incidence of non communicable diseases is yet high and is increasing day after day.<sup>[17-19]</sup>

As stated, despite the progress of medical science and public health, non communicable diseases such as

hypertension, diabetes, cardiovascular disease, cancers, and pulmonary diseases, not only in Iran, but also in the whole world have a high incidence and threaten the health of citizens. These diseases have common risk factors such as a sedentary lifestyle and lack of physical activity, which originate from the urbanization and inadequate urban spaces for active participation and daily mobility of the citizens. Other effective factors include unhealthy nutrition, stress, tobacco use, and all types of environmental pollutions, which are all the results of urban life and its complications. Therefore, one of the basic needs of today's life is promotion of awareness and knowledge of the society concerning the risk factors of these diseases and the ways to prevent them. In this regard, several studies, research, and educational interventions have been carried out, and various researchers have approached community health through different angles. On the other hand, provision of relevant education for the students, who are the future of the country, is of great importance. Preventive education at the student level not only has a positive, direct, and instantly effective role in lifestyle modification but also can have vaster effects through the transfer of information to the families as well, both of which can lead to lifestyle improvements and prevailing a healthy lifestyle in the various layers of the society in long term. In the present context, education, related to the prevention of non communicable diseases and the improvement of lifestyle at the student level, is presented. This study tried to approach the prevention of non communicable diseases with a new and different approach and analyze the factors, related to the efficacy of preventive programs, to prevent the inappropriate behaviors and non communicable disease risk factors from the viewpoints of the students, as the main addressee group of these programs.

### Analysis method

The present study was conducted with a qualitative approach and with conventional content analysis method.<sup>[20]</sup> Sampling was convenient and purposeful. Based on the fact that one of the most common strategies of purposeful sampling is to consider the maximum variation in which individuals with different perspectives in the field of research are selected,<sup>[21]</sup> in order to achieve maximum data rigor, we tried to select the participants with maximum variation in terms of age, gender, student's educational background, social status, etc., Data coding continued until when no new code was obtained. In other words, the interviews continued until data saturation and repetition of the previous categories. Participants included 27 students (primary school fourth grade up to pre university), studying at an educational unit in one of the six districts of Isfahan. The location of the interviews was also selected on the basis of the participant's convenience to make them

feel comfortable. Inclusion criteria were the willingness of participants to participate in the study and also studying in the fourth grade of elementary schools up to pre university in an educational unit in one of the aforementioned six educational districts in Isfahan in the academic year of 2016–2017. Exclusion criterion was the unwillingness to continue participation at any stage of the research. The method of data collection was deep semi structured interview with taking notes. The interviews began with the question “What information do you have about the behaviors and risk factors of non communicable diseases (nutrition, physical activity, overweight, tobacco)?” and then continued with probing questions. Data analysis was done by a qualitative content analysis method with inductive approach. Interviews were conducted over a period of 5 months from May to September 2017.

A total of 33 interviews were made with students, of which 27 were finally selected and analyzed. The duration of each interview varied from 8 to 45 min, and the average interview time was 18 min. To be sure of the word by word content of the interviews, they were recorded after obtaining interviewees’ permission and informed consent as well as parents’ permission. After each interview, at the earliest possible time, the texts were typed in a Word file. Subsequently, the text of each interview was repeatedly reviewed and reread for several times in order to obtain a sense of whole, and then, the contents were categorized and coded in terms of research-related concepts. Next, subcategories, subthemes, and themes emerged. After coding, the subthemes or main categories were extracted by the researcher, and after clarifying the meaning unit of each and reviewing the data classification, the final decision was made about them. All coding, analysis, and classification steps continued throughout the study.

### Validity and data rigor

For validity and rigor of the Data, four criteria of credibility, transferability, dependability, and confirmability were used.<sup>[22]</sup> Credibility was conducted by member check

and peer check; transferability by accurate expression and description; dependability through recording and collecting raw data and data reduction and results synthesis through briefing and categorization, and finally, confirmability was confirmed by external check on all study stages as well as accurate recording of all research steps through the text strip, notes, and analysis. Other ethical principles, observed in this research, were the awareness of the participants with the general objectives of the plan, the efforts to respect the participants’ peace of mind, the right to voluntary participation and withdrawal, respect to the confidentiality of their identity and dedication of a special code to their quotations, obtaining the necessary permissions to attend educational units, and coordinating with the managers of the educational units and the participants regarding the time and place of their interviews.

## Results

In this study, 27 students were interviewed [Table 1]. Finally, the analysis of participants’ statements resulted in the emergence of 18 subcategories and 7 main categories [Table 2]. The seven main categories included “grand health policy makings,” “the role of the educational system in promoting health,” “schools and healthy nutrition models,” “schools and sports and physical activity development,” “informal learning,” “preventive strategies in health promotion”, and “lifestyle modification.”

### Grand health policy-makings

One of the main categories, derived from the analysis of the participants’ viewpoints, was grand health policy makings. This main category has two subcategories of strategies related to health authorities and strategies related to health programs.

Participants’ viewpoints regarding “strategies related to health authorities” pointed out the authorities’ attention to community health and health planning. Among these

**Table 1: Demographic characteristics of the research population**

Sex	Girls		Boys						
Number	15		12						
Average age (years)	14.5								
Educational unit type	Governmental		Non-governmental		Specific				
Number	16		12		1				
Educational grade	Primary		Secondary (first stage)		Secondary (second stage)				
	4	5	6	7	8	9	10	3	4
Number	3	2	5	2	5	3	3	5	2
Education level	Bachelor and over		Bachelor		Associate degree		High school diploma and lower		
Number									
Father	6		4		2		15		
Mother	1		6		2		18		

**Table 2: Subcategory and main categories obtained from content analysis**

Subcategories	Main
Strategies related to health authorities	Grand health
Strategies related to health programs	policy-makings
Challenges in health education in schools	Role of the educational
Effective health education	system in promoting
Targeting education to promote health	health
Healthy Nutrition Challenges in Schools	Schools and healthy
Improving nutritional quality in school	nutrition model
Challenges of Physical Activity in Schools	Schools and sports
Role of the school in improving the	and physical activity
physical activity	development
Information-seeking behaviors	Informal learning
Effect of commercials on health behaviors	
Self-directed strategies for health	Preventive Strategies in
promotion	promoting Health
Regulatory strategies for health promotion	
Challenges for lifestyle modification	Lifestyle modification
Current nutritional practice	
Current tobacco use practice	
Current physical activity practice	
Personal strategies to improve lifestyle	

strategies were planning to raise public awareness and enriching the library of schools with health related books.

“So much information should be provided through education, relevant dialogs should be made in communities, it should increase so much in the mind that it is unconsciously repeated and done by individuals” (female participant, third grade of secondary school).

In the subcategory of “health related strategies,” there were some issues such as health planning and addressing the weaknesses of the programs. Participants believed that we should not be after shortterm goals and that the plans in Iran are fundamental with no appropriate mental support. “I think there is no thought room in Iran at all” (female participant, pre university).

### The role of the educational system in promoting health

This category includes three subcategories of challenges in health education in schools, effective health education, and targeting education in order to promote health. In the subcategory of “health education challenges in schools,” participants discussed issues such as defective educational system and the experience of inefficient programs. “I have a sedentary life. I’m always sitting and studying. I do not have time to change it. This opportunity has not been given to me. The opportunity should be given to you by the system” (female participant, grade 10).

“This year, a book was prepared for us. I do not mean all, but quite a percentage (of the kids) object against

it. It confronts the students’ desires and they say, these are not the thing that students should have in their curriculum.” (female participant, grade 10).

In the subcategory of “effective health education,” participants discussed issues such as the marginalization of health issues in their textbooks, the non applicability of some textbook materials, and the formation of workgroups in some high schools in the field of health. “Some schools form groups and some students join them and have to read a piece about this” (male participant, pre university).

“Besides it, some health behaviors may be found at the end of the book or its margins” (female participant, third grade of secondary school).

Participants such as the type of training, repetition, and continuity and the learners were placed in the subcategory of “targeting education in order to promote health.” “There must be something new, informing and shocking. For example, you say man! wow! I did not know that” (female participant, third Grade of secondary school), and “It exactly depends on the people themselves. Being a worrying person whose health is important to him/her, or a person who knows well about it but is zero in action” (female participant, grade 10).

### Schools and Healthy Nutrition model

This category consists of two subcategories of healthy nutrition challenges in schools and improving nutritional quality in schools.

In the subcategory of “healthy nutrition challenges in schools,” participants highlighted poor school performance and school problems in implementing healthy eating. “for example, someone should wash the fruit, and someone should dry it. It is a trouble for us. These obstacles, for example, may be in the way and can be the first excuse for us not to do this” (female participant, grade 10).

In the subcategory of “improving nutrition quality in schools,” participants indicated improvement of buffet and school performance. “They ordered not to sell sandwiches or pizzas as these are forbidden in our school. Potato chips and crunchy snacks are banned in our school. Mostly, they sell healthy things” (female participant, grade 5).

### Schools and sports and physical activity development

This category consists of two subcategories of the challenges of physical activity in schools and the role of school in improving physical activity.

In the subcategory of the “challenges of physical activity in schools” participants discussed the current situation of morning exercise and students’ escape from school sports. “From the primary school, at the time of morning exercise, the first thing we did was to make our faces frowny. The reason might be that the school staff themselves did not care and just wanted to film and send it to the relevant upper level educational office” (female participant, grade 10).

In the subcategory of “school role in improving physical activity”, participants suggested the promotion of morning exercise efficiency and boosting school sports. “They can allocate some days (for exercise) or screen the talented schoolgirls. Perhaps the kids, after being once worked on by their school teacher, may understand they can do it well and be interested in that sports” (Female participant, grade 10).

### Informal learning

This category includes two subcategories of information-seeking behaviors and the effect of commercials on health behaviors.

In the subcategory of information-seeking behaviors, participants referred to information sources and experiential learning. “Our health educator talked a lot about health” (male participant, grade 6). “Our teachers tell us most of these issues. For example, cancers that are caused by cell phone or television radiation” (male participant, third grade of secondary school).

In the subcategory of “the effect of commercials on health behaviors,” participants emphasized the need for proper management of media commercials, the dual roles of Internet and Iranian radio and TV organization. “It’s possible... to disseminate useful information in internet as the impact of virtual space and media is much more as most of people surf in these spaces. Of course, in my opinion, Radio and TV organization has a higher priority” (male participant, pre university).

### Preventive strategies for health promotion

This category includes two subcategories of self-directed strategies for promoting health and regulatory strategies for health promotion.

In the subcategory of “self-directed strategies for health promotion,” participants outlined factors such as personal factors, self-control, and stress management. “To reduce stress. well, the attitudes we have, the things that happen to us, from our own or from others (are important). We can relax through doing something like sports. We can do yoga” (female participant, third grade of secondary school).

In the subcategory of “regulatory strategies for health promotion”, participants outlined issues such as social factors and dependence on external control. “My mom adds salt to food but not always... I say do not add” (female participant, grade 9).

“...I lost 10 kilos. I was in good shape and satisfied with my body image. my doctor said I was overweight by 15 kilos. I did not like to reach that weight, about 57 or 58 kilos is ok” (female participant, grade 9).

### Lifestyle modification, A multifactorial phenomenon

This category consists of five subcategories of challenges for lifestyle modification, current nutritional practice, current tobacco use practice, current physical activity practice, and personal strategies to improve lifestyle.

In the subcategory of “healthy life style challenges,” participants indicated issues such as tobacco, low activity, and low urban commercial efficiency. “Water pipe is not a good thing, but now it is common among the young for fun. unfortunately, the young, along with healthy activities, do unhealthy activities such as smoking too” (male participant, pre university).

In the subcategory of “current nutrition practice,” the participants reported momentary pleasure, the role of the family atmosphere in nutrition, inconsistency in behavior and information, and so on. “My mom always follows (a healthy diet). She always says I try to use the least amount of oil or salt, but while cooking, I add a lot of oil although I know it is unhealthy” (female participant, grade 10). “The junk food, especially out of home!, the additives they use for better taste! That we love. I think it’s hard to let the feeling of taste pleasure go” (female participant, third grade of secondary school).

In the subcategory of “current tobacco use practice,” participants discussed personal effects, social effects, and tobacco control. “Although I’m a little kid... I feel like telling the boys who smoke not to do a wrong thing... why did cigarette come to Iran?... I would like to tell the enemy who does it that is a wrong job” (female participant, grade 6).

Issues such as lack of exercise and mere theoretic awareness of the positive effects of exercise were discussed in the subcategory of “current physical activity practice.” “The kids in Iran think to have grown up very soon. They want to behave like adults soon.... stop learning and put away everything including sports” (female participant, grade 10). “I tried, when we had fewer programs or no exam, for example, to take a walk as it is refreshing” (female participant, grade 10).

In the subcategory of “personal strategies to improve lifestyle” participants referred to topics such as the use of knowledge and having a positive role model for lifestyle. “We eat as much as we need for our bodies. When we are not hungry anymore, we stop eating... not continue eating more... our parents did that and we saw their behavior and learned from it and do it ourselves” (female participant, grade 6).

## Discussion

Several factors have contributed to the efficacy of prevention of non communicable diseases. Appropriate and purposeful educational programs including long term and short term programs, coverage of all age groups of students (at different educational levels, even preschool, and before that), use of various methods and tools in education in order to make it attractive (focusing on practical and objective education), providing the necessary infrastructure for lifestyle modification, and maintaining appropriate and continuous monitoring of the programs progression are among the factors that can lead to more effective preventive education. Starting the education from the moment the children enter the educational system can increase individuals’ awareness and, through the transfer of information to parents, can result in the promotion of social awareness, and consequently, a change in attitude and improvement of practice in lifestyle. In this regard, we believe that improvements in general health will be achieved by improving health education and the access to information.

The results of this study are categorized into seven main categories including “grand health policy-makings,” “the role of the educational system in promoting health,” “schools and healthy nutrition models,” “schools and sports and physical activity development,” “informal learning,” “preventive strategies in health promotion,” and “lifestyle modification: A multifactor phenomenon.”

One of the important subcategories of this study was “effects of commercials on health behaviors.” Participants pointed to the beneficial effects of commercials on people and the sensitization of society through urban commercials, and considered the effectiveness of media commercials more than urban commercials. Several studies have been conducted in the field of health and media. Examples include the study of media content in particular fields of health and health media education.<sup>[23,24]</sup> In this regard, Alimahdi and Ghorbani believe that for proper implementation of health programs and promotion of health in Iran, full capacity of radio and television, especially those in provincial centers, should be used. They also believe that the negative role of radio

and television, especially TV in health, is more related to watching television by the audience and provision of inappropriate health content in this medium.<sup>[25]</sup> The findings of Tavousi *et al.* showed that radio and television have a high penetration rate among the urban population of Iranians, and the highest level of health information is transmitted to their participants in the research by these two media. Accordingly, and with regard to other advantages of these two media such as their spread in Iran, the cost-efficacy of transferring information through them, and accurate monitoring of the accuracy and continuity of information, they suggest that using these two media provides correct, accurate, and continuous health information to a wide range of audiences and improves their health literacy.<sup>[13]</sup>

Other subcategories of this study included “effective education in health.” In this regard, participants pointed to issues such as school educational content and health and the role of the educator in promoting healthy lifestyles. In this regard, the participants believed that the issues on the prevention of non communicable diseases were not only ignored in the textbooks, but also some contents of the textbook are not applicable as well. Studies have shown the impact of educational content as well as the educator on the efficacy of education. One of the key strategies in the WHO Cancer Control Program is to raise awareness among individuals.<sup>[9]</sup> Meanwhile, the important role of teachers<sup>[26]</sup> and schools as an appropriate place for education of the students and their families and finally the education of health-related subjects to increase awareness, attitude, and role modeling of healthy behavior is undeniable.<sup>[12]</sup> Furthermore, Mahmoud Abad *et al.* reported that educational intervention had a significant effect on knowledge, attitude and practice of health in the experimental group.<sup>[8]</sup> Javaheri *et al.*, based on their research, suggest that as poor food habits, inactive lifestyles, and the tendency toward tobacco are formed at an early age and last for a long time over the next years, the necessary steps to follow the principles of a healthy lifestyle should be taken before the fixation and formation of these habits, as the subsequent efforts to change these habits would be very difficult and maybe impossible.<sup>[11]</sup>

One of the main categories of the study was the educational environment, which referred to the type of participants’ practice such as current inadequate commercials and informatics at schools and fewer high school hours, spent on health. Participants also suggested ways to invite experts to inform the students about a healthy lifestyle in the morning ceremony and engaging the students, individually and in group, in encouragement to health promotion.

Social organizations such as schools, workplaces, worship places (mosques and churches), and health centers also

play a significant role in health and its promotion. Promoting health through these organizations provides an opportunity for direct and indirect intervention among a wide range of audiences. The use of these centers in overcoming unhealthy behaviors such as smoking, healthy diet disobedience, drinking alcohol, and not doing sports and physical exercises has been very successful.<sup>[21]</sup> Bonel *et al.* examined theories of how schools' environment influenced the students' health. After systematic review of the influential theories on the school environment, they developed an integrated theory of the effects of the school environment on students' health. This theory can report complex interventions such as promoting school health programs.<sup>[27]</sup>

One of the challenges of lifestyle modification can be stressors and their effects, as well as inconsistency of practice and knowledge. Therefore, stress management training and its correction with environmental conditions to lower stress for individuals can be effective to improve lifestyle. In this regard, we know that moving toward individual and organizational goals, and ultimately, the advancement of society depends on individuals' function. Stress has the most important impact on individuals' function, and if it is less or more than normal, it leads to a decrease in it. However, the amount of stress in a balanced manner leads to the best individuals' function.<sup>[28]</sup> There is strong evidence that stress can lead to negative consequences such as physical illnesses, mental disorders, or burnout in individuals. On the other hand, numerous researches have shown that stress and psychosocial tensions are the factors, independent of age, sex, and other factors in cardiovascular diseases, which, through psychological, neurological and physiological mechanisms, can cause or prolong cardiovascular diseases.<sup>[29,30]</sup>

One of the other challenges of lifestyle modification, suggested by the participants, was the low efficiency of urban commercials. Azam Kasiri believes that urban commercials as a cosmological and expressive system and a message oriented media encompass the major part of the urban graphics system in today's world. Environmental commercials, media, and visual expression of commercial, cultural, social, and political meanings, in accordance with the principles of visual aesthetics, are in various urban spaces and places of urban citizens' commutation. Its purpose and application are to create diversity and beauty and to communicate quickly, explicitly, and accurately to the audience. Urban media include various structural forms, each of which, based on its expressive structure, induces a meaning that, if it is taken into account and its semantic structure is recognized, can play an important role in the sustainable development of the city.<sup>[31]</sup> Ebrahimzade *et al.* also believe that the dimensions of the efficacy of

commercials including visual attractions, believability, relevancy, ability to persuade, the dimension of content and information, and the ability to be reminded influence the tendency and interest in commercials and thus awareness of commercials, their imagination in audience's mind, and tendency to use their messages. Accordingly, it can be argued that modification and improvement of urban commercials affect lifestyle modification.<sup>[32]</sup>

In the subcategory of current nutritional practice, participants discussed issues such as individuals' awareness, the role of the family atmosphere in nutrition, the impact of environmental conditions on nutrition, and inconsistency of behavior and information. In subcategory of the role of the family atmosphere in nutrition, they indicated the inadequacy of current parenting education and formation of inappropriate food habits according to the existing conditions in the family. Shakiba *et al.* pointed to the lack of proper awareness of appropriate food, lack of time to prepare proper foods, high costs of some materials, difficulty of their procurement, and unavailability of facilities and inconsistencies in the diet of different members of the family as the barriers in nutritional modification. In this way, it can be concluded that people still need to learn more and more efficiently to attain the appropriate culture of their nutritional and their lifestyle, which requires more money and time.<sup>[10]</sup>

In subcategory of practice modification from personal strategies to improve lifestyle, participants pointed out lifestyle changes due to future effects of behavior and the practice of the already gained knowledge. In this regard, Zare *et al.* (2016) suggest that physical activity promotion is one of the most effective strategies to reduce the risk of some non communicable and chronic diseases.<sup>[33]</sup> The researchers, quoting from Aghamolayee *et al.* (2009), state that regular physical activity, as an important health-promoting behavior, can prevent or delay all kinds of chronic diseases and mortality and improve mental health, life satisfaction and quality of life.

In the present research, we tried to study non communicable diseases with a new and different approach, while analyzing the factors related to the efficacy of preventive programs for risky behaviors of these diseases, to achieve strategies to improve the quality of such educations from students' perspective as the main users of these programs. In this way, by cooperation of managers and planners, our suggested applicable strategies can increase the efficacy of such programs. Among the strength points of this study, a relatively large number of students and the maximum variation of the participants can be mentioned as we tried to cover all geographical and educational districts, all

economic status, and all types of educational centers, etc., in addition to paying attention to gender and academic background in selecting students. One of the limitations of this study was to limit the participants to just Iranian nationality.

## Conclusion

Planning to eliminate the barriers and challenges, associated with the efficacy of education, and having strategic plans and applying the strategies, related to improving education, have been effective in empowering the preventive education of non communicable diseases and may lead to lifestyle modification in the society, and this can be a promise for a healthy society in short future.

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## Conflicts of interest

There are no conflicts of interest.

## References

1. Rezapour A, Ebadi Fard Azar A, Asadi S, Bagheri Faradnebeh S, Tufan F. Estimation of the odds ratio of factors affecting household exposure to sky high costs and leading to poor health. *Mil Med* 2016; 18:355-61.
2. Khanniki H, Racy Tehrani H. Students' attitudes on the impact of television health messages. *Cult Commun Stud* 2011; 12:152-78.
3. Pirzadeh A, Sharifirad G. A survey of healthy life styles in teachers in district 4 of Isfahan, Iran. *J Health Syst Res* 2011;7:1075-81.
4. Momayezi M, Fallahzadeh H, Farzaneh F. Evaluation of physical activity in patients with hypertension in Yazd: A case-control study. *Health Sunrise* 2015;14:139-48.
5. Carlson JP, Vincent LH, Hardesty DM, Bearden WO. Objective and subjective knowledge relationships: A quantitative analysis of consumer research findings. *J Consum Res* 2009;35:864-76.
6. Dancy C, Lohsoonthorn V, Williams MA. Risk of dyslipidemia in relation to level of physical activity among Thai professional and office workers. *Southeast Asian J Trop Med Public Health* 2008;39:932-41.
7. Recours R, Hanula G, Travert M, Sabiston C, Griffet J. Governmental interventions and youth physical activity in France. *Child Care Health Dev* 2011;37:309-12.
8. Mahmood Abad SS, Noorbala MT, Arjmandi M, Mirzaei Alavijeh M, Fazelpoor SH, Soltani T, *et al.* Effectiveness of skin cancer prevention educational program among teachers in Yazd city. *Tolooe Behdasht* 2015;14:139-49.
9. World Health Organization Media centre. Cancer. Geneva; World Health Organization Media centre; February 2012 Available From: <http://www.who.int/mediacentre/factsheets/fs297/en/index.html>. [Last accessed on 2012 Nov 13].
10. Shakiba S, Shojaeizadeh D, Sadeghi R, Azad K. The effectiveness of educational intervention based on the health belief model on eating style and the severe reduction of menstrual pain among clinical personnel of the Imam Khomeini hospital complex. *Iran J Health Aduc Health Promot* 2016;4:158-68.
11. Javaheri J, Farajzadegan Z, Shams B, Kelishadi R, Sharifirad Gh, Asgari M, *et al.* Evaluating healthy life style education to adolescents by means of direct method, parents, and teachers using CIPP evaluation model. *Iran J Med Educ* 2010;10:219-28.
12. Baghiani moghadam MH, Mohammadi S, Mazloomi Mahmoudabad SS, Norbala MT. The effect of education based on protection-Motivation theory on skin cancer preventive practices among female high school students in Yazd. *Ofogh Danesh J Gonabad Univ Med Sci* 2011;17:27-35.
13. Tavousi M, Haeri Mehri A, Rafiefar Sh, Solimanian A, Sarbandi F, Ardestani M. *et al.* Health literacy in Iran: Findings from a national study. *Payesh* 2016;1: 95-102.
14. Kelishadi R, Hashemi poor M, Sarraf zadegan N, Sadri GH, Bashardoost N, Alikhasi H, *et al.* Effect of some environmental factors on smoking and the consequences of smoking on major cardiovascular disease (CVD) risk factor in adolescent: Isfahan healthy heart program-Heart health promotion from childhood. *J Guilan Uni Med Sci* 2004;13:62-75.
15. Rookhazfa HR, Sadeghi M, Yazdekhesti S, Khani A, Sarrafzadegan N. Relation of smoking status and stress level: Isfahan healthy heart program. *J Res Behav Sci* 2011; 9:131-37.
16. Malekhamdi MR, Roozbehani A, Khayatan F. Healthy heart project of Shahrekord elementary schools. *Isfahan Med Sch J* 2009;27:62.
17. Ahmadi A, Soori H, Mobasheri M, Etemad K, Khaledifar A. Heart failure, the outcomes, predictive and related factors in Iran. *J Mazandaran Univ Med Sci* 2014; 24:180-8.
18. Ameri H, Alizadeh S, Barzgar A. Identification of effective factors on myocardial infarction in diabetic patients using C and R algorithm. *Daneshvar Med* 2014;112:1-13.
19. Karimy T, Saffari M, Sanaeinasab H, Khalagi K, Hassan-Abadi M. The impact of educational intervention based on the theory of planned behavior on lifestyle change of patients with myocardial infarction. *Iran J Health Educ Health Promot* 2016;3:370- 80.
20. Hsieh HF, Shannon S. Three approaches to qualitative content analysis. *Qual Health Res* 2005;15:1277-88.
21. Creswell JW, Plano Clark VL. *Designing and conducting Mixed Methods Research*. Los Angeles, London: Sage; 2011.
22. Elo S, Käriäinen M, Hanste O, Pölkki T, Utrianen K, Kyngäs H. Qualitative content analysis: A focus on trustworthiness. *Sage Open* 2014; 1-10.
23. Nawkova L, Nawka A, Adamkova T, Rukavina TV, Holcnerova P, *et al.* The picture of mental health/illness in the printed media in three central European countries. *J Health Commun* 2012;17: 22-40.
24. Velasco HF, Cabral CZ, Pinheiro PP, Azambuja RdC, Vitola LS, *et al.* Use of digital media for the education of health professionals in the treatment of childhood asthma. *J Pediatr* 2015;91:183-8.
25. Alimahdi M, Ghorbani F. The role of the Islamic republic of Iran broadcasting in health improvement: A study for Khorasan Razavi broadcasting. *J Qual Res Health Sci* 2015;4:326-38.
26. Kelley MA. Culturally appropriate breast health educational intervention program for African-American women. *J Natl Black Nurses Assoc* 2004;15:36-47.
27. Bonell CP, Fletcher A, Jamal F, Wells H, Harden A, Murphy S, *et al.* Theories of how the school environment impacts on student health: Systematic review and synthesis. *Sci Direct* 2013;24:242-9.
28. Badalzadeh A, Mirshahjafari SA. The effect of inservice training courses on reducing staff in Isfahan University of medical sciences, Iran. *J Health Syst Res* 2018;13:405-9.
29. Radmehr P, Yousefvand L. The investigating rate of



- mindfulness-based cognitive therapy in reduces perceived stress and increase life expectancy in women suffering coronary artery disease, *Iran J Health Educ Health Promot* 2017;5:164-72.
30. Ghassemi-Pirbalouti A, Alavi-Eshkaftaki S. Association of organizational culture and job stress with mental health in nurses in Hajar and Kashani hospitals of Shahrekord city. *J Clin Nurs Midwifery* 2013;2:53-63.
  31. Azam Kasiri A. Semantic matching of environmental advertising system and Sustainable city. *Sustain Arch Urban Dev* 2015;3:47-58.
  32. Ebrahimzade R, Haghghat S, Hemati A. Presentation a model in order to evaluate the effectiveness of urban advertising with financial-Ecinimic approach. *Urban Manage* 2018;51:345-56.
  33. Zare F, Aghamolaei T, Ghanbarnejad A, Hajializadeh K, Zarei H. The effect of transtheoretical model-based education on promoting physical activity among employees of Abumusa Island, Iran, *J Health Syst Res* 2016;12:90-5.