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Article in *Shiraz E Medical Journal* · March 2018

DOI: 10.5812/semj.13940

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Health Education Performance in Health Houses: A Descriptive study from Iran during April-September 2011

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Received 2017 March 01; Revised 2017 May 23; Accepted 2018 February 10.

Abstract

Background: One of the many tasks of rural health houses (HHs) is to provide health education for rural clients.

Objectives: The purpose of this study was to assess the conditions and responsibilities of HHs regarding health education.

Methods: Through systematic random sampling, 1600 HHs were selected during April-September 2011. Besides the characteristics of HHs, type of training, audience groups, time of education, number of participants, and reasons for educational classes were requested in a written format from the selected HHs. Data were analyzed using Excel 2007 and SPSS version 16.

Results: In total, 21.9% of HHs had no group education within the first 5 months. Most education was related to the field of reproductive health, followed by intestinal diseases. The largest target group included mothers eligible for family planning. The mean duration of education was 33.6 minutes per week. Based on the findings, 55% of training was conducted due to provincial health priorities.

Conclusions: Although cardiovascular diseases, road traffic accidents, and cancers are the major causes of mortality in Iran, most education concentrated on reproductive health, as well as mother and child health. Therefore, modifications in educational methods and planning are necessary.

Keywords: Evaluation, Rural Health Center, Health Education

1. Background

Iran, a lower-middle-income country, is situated in the Eastern Mediterranean Region or Southwest Asia. More than 79,109,000 people live in this country, with 23 million residing in rural areas. In recent years, by adaptation of the declaration of Alma-Ata, Iranian administrators have paid particular attention to primary health care (1-5). The national health network of Iran was established in 1985, prioritizing less privileged rural areas of the country.

In the healthcare system of Iran, a health house (HH) is the most comprehensive health unit. At this point, there are 16,000 HHs all over the country, and their major responsibility is to provide primary health care for clients (2008). The effects of these HHs on improving the population's health against contagious diseases, maternal and neonatal mortality, life expectancy, and vaccination have been reported (6-9).

Health is a global and multifaceted issue, influenced

by various factors. Among these factors, one can mention health education (10). Previous studies have revealed that education can positively affect health. Overall, the goal of education is to enhance health awareness and attitude, which in turn improves the individual's behaviors and promotes health, comfort, and overall performance in all areas of health (11, 12).

Based on the definition proposed by Green and Kreuter, health improvement is a combination of educational and environmental support, promoting a healthy lifestyle (13). In the primary health network of Iran, HHs are among these training centers. One important responsibility of these HHs is to educate people and increase their cooperation in different areas.

Based on the definition of the world health organization (WHO) (14), evaluation aims to present some information regarding efforts to enhance the effectiveness of interventions. Based on this evaluation, training planning is an important factor. The significance of the present

study is the proper implementation of effective interventions on a proper target group and evaluation of the cost-effectiveness of the program.

2. Objectives

This study was conducted on the processes of educational interventions in HHs during April-September 2011 in order to provide a more accurate planning, to promote changes in administrative actions, and to provide the required education through interventions by the ministry of health.

3. Methods

In this descriptive study, 10% of all HHs under the coverage of the ministry of health and medical education (MOHME) of Iran were selected via systematic random sampling. For this purpose, a number was randomly selected, and 1600 HHs, affiliated to 45 universities of medical sciences, were selected, according to the sample formula in Microsoft Excel 2007. After determining the desired week and HHs, a list of health education and health priorities of HHs, selected among universities of medical sciences, was requested. The topics of group education sessions and other subjects were described in 2 forms from April to the end of September 2011 on a weekly basis.

Rural primary healthcare workers completed the data, which were then checked by an expert. The questions in the first form included the list of health priorities, registered priorities, level of priorities, and method of determining priorities (2 open and 3 closed questions). The training subject, target groups, reasons for education, number of participants, and date of education were requested in the second form. Characteristics of healthcare workers and the covered population were at the top of the second form. The items were prepared and validated in joint sessions by healthcare network professionals, as well as experts in health education. All the processes were conducted through official correspondence by the health network on behalf of the department of health education and promotion in 2011. Follow-up was performed via phone calls to complete the forms.

Data were entered into Excel 2007. After coding and categorizing the data into educational topics and target audiences, they were entered into SPSS version 16. Descriptive tests were used to analyze the data. This study was approved by the committee of the department of ethics and health policies.

4. Results

In this study, 1498 out of 1600 HHs completed the questionnaires (response rate, 93.6%). The forms were sent to 1498 HHs. The data from 3 universities of Kurdistan, Hamadan, and Neyshabur were not considered in the final analysis due to lack of response. Distribution of HHs based on the covered population size is presented in Table 1. Due to the shutdown of HHs or leave/transfer of primary healthcare workers, 325 (21.6%) HHs included no group education from March to July. The mean number of primary healthcare workers was 2.1 ± 0.98 in HHs; most selected HHs had at least 1 male and 1 female primary healthcare worker.

Table 1. Categorization of the Selected Health Houses (HHs) Based on the Covered Population Size

Category	No. (%)
< 500	315 (21.6)
500 - 1000	495 (34)
1000 - 1500	300 (20.6)
1500 - 2000	165 (11.3)
> 2000	182 (12.5)
Total	1457 (100)

The educational sessions for employees in HHs involved topics on family planning (9%), feeding infants and children (6.8%), and intestinal-seasonal diseases (5.8%). Women's cancers accounted for 3.2% and safe delivery for 1% of sessions. In total, 28.3% of educational programs was related to the field of reproductive health. The educational topics were highly dispersed, ranging from sanitary waste disposal, professional health in carpet weaving, and farming to risky behaviors, such as substance abuse and smoking.

Most education in the field of infectious diseases was respectively related to brucellosis, rabies, tuberculosis, malaria, and influenza, which are mostly zoonotic diseases (4.4%). Intestinal diseases mostly included Eltor and diarrhoeal diseases. Education about noncontagious diseases, thalassemia, diabetes, hypertension, and iodine-related diseases was more than other conditions; Table 2 presents this information.

According to the results, the mean length of education was 33.6 ± 18.0 minutes per week. The maximum time of education was 64.67 ± 32.6 minutes per week at the University of Ilam. The reason for holding educational sessions was health priority in 679 (55.5%) HHs and health emergencies in 47 (8.3%) HHs. Other reasons included the city's

Table 2. Topics of Education in the Selected Rural Health Houses (HHs)

Field and Topic of Education	(%)
Reproductive health	28.3
Occupational and environmental health (agriculture)	6.9
Seasonal and intestinal diseases	5.8
Elderly health	5.1
Zoonotic diseases	4.4
Nutrition and food hygiene	4.3
Infectious diseases	4.1
Healthy lifestyle	3.8
Cardiovascular diseases	3.4
Mental health	1.8
Risky behaviors (smoking and drug use)	1.8
Thyroid diseases	1.7
Accidents and first aid	1.2
Oral health	0.7
Other common topics	20.4
Total	100

health center notifications (17.2%), special calendar time (7.5%), and other reasons (16%), respectively.

As the results showed, in all provinces of Iran, women and mothers eligible for reproductive health services accounted for 39.9% of the target groups. The second largest group included villagers, followed by pregnant and breastfeeding mothers. The primary healthcare workers and smokers comprised the lowest percentage of target groups (0.1%). In addition, East Azerbaijan, Isfahan, and Mazandaran provinces included more eligible women in the target groups, respectively; the results are presented in Table 3.

In terms of family planning, most education was provided for cities with a higher population growth, such as Sistan-Baluchestan and Hormozgan. Regarding the area of breast feeding, Khuzestan, Khorasan, Tehran, Yazd, Kermanshah, and Bushehr provinces received more education; Table 4 presents this information.

5. Discussion

The present study revealed that most of the provided education in HHs was related to the fields of family planning, maternal and child health, and reproductive health. In recent years, the high rate of reduction in total fertility has been discussed, and new approaches are necessary in this area. Overall, studies on the efficacy of education for family planning seem inadequate (15).

Table 3. The Target Groups of the Selected Health Houses (HHs)

Target Groups	Percentage
Mothers and women eligible for reproductive health services	39.9
General public	12.7
Pregnant or breastfeeding women	10.8
Elderly	7.9
Farmers	3.2
Patients and families	2.8
Students	2.7
Housewives	2.4
Healthcare workers ^a	1.7
Council members and rural municipal administrators	1.4
Workers	1.4
Young couples	1.3
Primary healthcare workers	0.1
Smokers	0.1
Other target groups	11.6
Total	100

^aHealthcare workers as the medium between primary healthcare workers and people.

Reproductive health includes physical, mental, and social health, besides different aspects, processes, and functions of the reproductive system. It encompasses family planning services, HIV/AIDS and other sexually transmitted diseases, maternal and neonatal health, sexual violence (16), and all aspects of human health from birth to death. The international conference on population and development (ICPD) in Egypt highlighted the need to promote reproductive health programs around the world (17). Therefore, it seems that considering women's health issues, it is necessary to increase the coverage of family planning. Some provinces, which have the highest rates of family planning, also have a total fertility of less than 2 children in Iran.

Another topic was rural environmental health, which was mostly discussed in the marginal cities of Southwest and Northwest of Iran near the Lake Urmia. It seems that the poor conditions of rural environmental health have prompted primary healthcare workers to provide more instructions for patients. The rural culture is changing towards consumerism, which in turn leads to the production of imperishable waste. On the other hand, the rural population is still oblivious to waste management and environmental health (18). Although the exact content of these educational programs is not the focus of this study,

Table 4. Topics of Education in Provinces and Medical Universities Under Study

	Province (University or City)	Topics	Percentage
1	Mazandaran	RH	17.3
2	Gilan	ZD and ID	18.9
3	Semnan (Semnan ^a and Shahrud)	IDD	27.3
4	Yazd	CN	13.2
5	Ardabil	OC	10.3
6	East Azerbaijan	EH and ZD	21.4
7	West Azerbaijan	EH	17.3
8	Khorasan (Mashhad, Sabzevar, Torbat-e Heydarieh)	RH	30.2
9	Ilam	CN and ID	25.7
10	Tehran and Karaj	CN	24
11	Golestan	Elderly health and OC	20.6
12	Kohgiluyeh and Boyer Ahmad	EH	11.5
13	Isfahan and Kashan	OC	13.3
14	Kerman (Kerman, Jiroft, Rafsanjan)	RH	28.6
15	Zanjan	Intestinal diseases	9.6
16	North Khorasan	CN and elderly health	20
17	South Khorasan (Birjand)	OC and ZD	23.8
18	Chaharmahal and Bakhtiari (Shahrekord)	Water sanitation	14
20	Bushehr	CN and EH	28
21	Kermanshah	CN and EH	25
22	Khuzestan (Dezful, Ahvaz)	CN and food hygiene	18.6
23	Hormozgan	OC	19.4
24	Markazi (Arak)	OC and ZD	19.6
25	Sistan and Baluchestan (Zahedan)	OC	15.9
26	Lorestan	Intestinal and parasitic diseases	13.2
27	Fars (Shiraz and Jahrom)	Women's cancers	12.8
28	Qazvin	Women's cancers	9.5

Abbreviations: CN, child nutrition; EH, environmental health; ID, infectious diseases; IDD, iodine deficiency disorders; OC, contraceptive methods; RH, reproductive health; ZD, zoonotic diseases.

^aCity.

it seems necessary to create an intersectional partnership in the area of rural environmental health education, as rural municipal administrators manage rural environmental health.

Another issue was related to zoonotic diseases, which are common in provinces, such as Isfahan (19) and Yazd (20). However, the prevalence in these provinces is much lower than the mean national rate. Previous studies have emphasized on the importance of education for coetaneous leishmaniasis (21) in the endemic regions of Isfahan (22). The healthcare system should determine whether the given education is in accordance with the recognized importance of diseases in the region or is inconsistent with the region's priorities.

In case of intestinal diseases, more education was provided in rural HHs, perhaps since most education was provided in summer, when diarrheal and intestinal diseases, such as Eltor, are more common. Coronary heart disease (CHD) is the leading cause of mortality in Iran, comprising about 50% of all deaths (23, 24). Other studies have focused on the increasing prevalence of metabolic syndrome and obesity in Iran and have proposed various interventional methods (25, 26).

Although the mentioned diseases comprise the health priorities of Iran and less educated people (such as rural populations) are at a great risk of these diseases (27), only a small part of HH training was dedicated to cardiovascular diseases and risk factors in our study. In rural populations of Alabama (USA), India, and Egypt, similar results have highlighted the need for education regarding the risk factors (28-30). The limited education may be related to the negligence of this issue as a priority for human forces, low capacity for the desired level of education, and lack of attention by the authorities.

In a study by Mooney LA and Franks AM, instructions about cardiovascular risk factors were accompanied by disease screening (31). Since the prevalence of CHD is higher in men than women and the relationship between education and CHD risk factors varies according to gender (32), different types of education and training are necessary for men and women.

Road accidents are the second leading cause of death in Iran (33). In fact, the mortality rate is 10 times higher than the global mortality rate due to car accidents (34). Moreover, mortality rate due to road injuries is higher than the average rates in other countries (35). However, despite its great importance, limited instructions are provided in this area. The need for safety education and control of road accidents in Iran is reportedly similar to Pakistan (36). It seems that intersectoral attempts at training in this area must be in collaboration with the police force, highway patrol, mass media, and ministry of health.

In a study conducted in Fars Province, Iran, 10.7% of all deaths were related to accidental injuries (unintentional injuries) in rural regions (37). Therefore, special attention should be paid to the education of male drivers, accompa-

nied by an injury surveillance system. Considering the target groups, it seems that besides mothers (with children < 5 years), pregnant women, and eligible women for family planning, particular attention should be paid to teenagers and their risky behaviors, as well as patients with chronic diseases, risk factors for chronic diseases, and men with high-risk jobs.

Self-care education should be considered in diseases, such as hypertension and diabetes. Iran is a country with diverse ethnicities, languages, and priorities (38). Therefore, these differences and priorities, as well as people's needs and beliefs, should be taken into consideration in the design of training programs in HHs.

Among the limitations of the present study, one can mention the absence of a detailed examination of the content, effectiveness, and efficiency of educational programs; lack of examination through the year is another shortcoming. However, a major strength of this study is the comprehensive and nation-wide review of health clinic education.

5. Conclusions

This study examined the public educational programs of HHs, considering the health priorities of each region and the target rural groups. It seems that most education in these HHs does not correspond to the needs of the region. Regarding contagious diseases and infections, some of the provided education did not match the prevalent diseases in the region. Despite the great importance of contagious diseases, little efforts have been made to educate people, and there is limited education on this subject. Although cardiovascular diseases, road traffic accidents, and cancers are the major causes of mortality in Iran, most provided education focused on reproductive health and mother and child health.

We suggest reforms at all levels of the primary health network of Iran. Similar to other WHO health promotion programs, such as health promotion hospital (HPH), which considers education and health promotion of clients, staff, organization, and community (39, 40), multidimensional education can be integrated in Iran. On the other hand, new methods of education, such as use of mobile phones and social networks, are suggested to improve evidence-based education in the future.

Implications for health policymakers/practice/research/medical education

This study can be helpful in the development and promotion of health education in Iranian health houses.

Acknowledgments

We would like to thank Majid Talkhabi and Hosein Moradi for their assistance in the analysis of data. We also extend our gratitude to the personnel of health education and promotion office of the Ministry of Health and Medical Education, as well as all research members who worked at the medical universities.

Footnotes

Authors' Contribution: Fatemeh Rahmati-Najarkolaei contributed to the study design, statistical analysis, and writing of the manuscript. Tayebeh Rakhshani was supervisors of the study. Majid Tavakoli and Hossein Sobati collected the data, and Sedigheh Sadat Tavafian edited the manuscript. All authors read and approved the final manuscript.

Ethical Considerations: Ethical issues (including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) were completely observed by the authors. The education and health promotion office of Iran ministry of health and medical education approved the protocol of this study.

Funding/Support: This study was supported by the health education and promotion office of Iran ministry of health and medical education.

References

1. Ahmad Kiadaliri A, Najafi B, Haghparast-Bidgoli H. Geographic distribution of need and access to health care in rural population: an ecological study in Iran. *Int J Equity Health*. 2011;**10**:39. doi: [10.1186/1475-9276-10-39](https://doi.org/10.1186/1475-9276-10-39). [PubMed: [21939511](https://pubmed.ncbi.nlm.nih.gov/21939511/)].
2. Jatrana S, Crampton P. Primary health care in New Zealand: who has access?. *Health Policy*. 2009;**93**(1):1-10. doi: [10.1016/j.healthpol.2009.05.006](https://doi.org/10.1016/j.healthpol.2009.05.006). [PubMed: [19535163](https://pubmed.ncbi.nlm.nih.gov/19535163/)].
3. Mehrdad R. Health system in Iran. *JMAJ*. 2009;**52**(1):69-73.
4. Society IC. *Geography of Iran: facts and figures*. 2001. Available from: <http://www.iranchamber.com>.
5. WHO. *Iran (Islamic Republic of)*. 2015. Available from: <http://www.who.int/countries/irn/en/>.
6. Farzadfar F, Murray CJ, Gakidou E, Bossert T, Namdaritabar H, Alikhani S, et al. Effectiveness of diabetes and hypertension management by rural primary health-care workers (Behvarz workers) in Iran: a nationally representative observational study. *Lancet*. 2012;**379**(9810):47-54. doi: [10.1016/S0140-6736\(11\)61349-4](https://doi.org/10.1016/S0140-6736(11)61349-4). [PubMed: [22169105](https://pubmed.ncbi.nlm.nih.gov/22169105/)].
7. Movahedi M, Haghdoost AA, Pournik O, Hajarizadeh B, Fallah MS. Temporal variations of health indicators in Iran comparing with other Eastern Mediterranean Region countries in the last two decades. *J Public Health (Oxf)*. 2008;**30**(4):499-504. doi: [10.1093/pubmed/fdn071](https://doi.org/10.1093/pubmed/fdn071). [PubMed: [18772146](https://pubmed.ncbi.nlm.nih.gov/18772146/)].
8. Nasserli K, Sadrizadeh B, Malek-Afzali H, Mohammad K, Chamsa M, Cheraghchi-Bashi MT, et al. Primary health care and immunisation in Iran. *Public Health*. 1991;**105**(3):229-38. [PubMed: [2062995](https://pubmed.ncbi.nlm.nih.gov/2062995/)].

9. Salehi-Isfahani D, Abbasi-Shavazi MJ, Hosseini-Chavoshi M. Family planning and fertility decline in rural Iran: the impact of rural health clinics. *Health Econ*. 2010;**19** Suppl:159–80. doi: [10.1002/hec.1613](https://doi.org/10.1002/hec.1613). [PubMed: [20552711](https://pubmed.ncbi.nlm.nih.gov/20552711/)].
10. Furnee CA, Groot W, van den Brink HM. The health effects of education: a meta-analysis. *Eur J Public Health*. 2008;**18**(4):417–21. doi: [10.1093/eurpub/ckn028](https://doi.org/10.1093/eurpub/ckn028). [PubMed: [18434381](https://pubmed.ncbi.nlm.nih.gov/18434381/)].
11. Rahmati Najarkolaei F, Ghaffarpasand E, Gholami Fesharaki M, Jonaidi Jafari N. Nutrition and physical activity educational intervention on CHD risk factors: a systematic review study. *Arch Iran Med*. 2015;**18**(1):51–7. [PubMed: [25556387](https://pubmed.ncbi.nlm.nih.gov/25556387/)].
12. Hawks SR, Smith T, Thomas HG, Christley HS, Meinzer N, Pyne A. The forgotten dimensions in health education research. *Health Educ Res*. 2008;**23**(2):319–24. doi: [10.1093/her/cym035](https://doi.org/10.1093/her/cym035). [PubMed: [17827470](https://pubmed.ncbi.nlm.nih.gov/17827470/)].
13. Tagoe M, Aggor RA. Knowledge, behaviour, perceptions and attitudes of University of Ghana students towards HIV/AIDS: what does behavioural surveillance survey tell us?. *J Health Hum Serv Adm*. 2009;**32**(1):51–84. [PubMed: [19558033](https://pubmed.ncbi.nlm.nih.gov/19558033/)].
14. WHO. Iranian health houses open the door to primary care. *Bull World Health Organ*. 2008;**86**(8):585–6. [PubMed: [18797612](https://pubmed.ncbi.nlm.nih.gov/18797612/)].
15. Kamalikhah T, Rakhshani F, Rahmati Najarkolaei F, Gholian Avval M. Evaluation of Transtheoretical Model-Based Family Education Among Females of Zahedan (Southeast of Iran). *Iran Red Crescent Med J*. 2015;**17**(10). e18895. doi: [10.5812/ircmj.18895](https://doi.org/10.5812/ircmj.18895). [PubMed: [26568846](https://pubmed.ncbi.nlm.nih.gov/26568846/)].
16. UNHCR. *Reproductive health in refugee situations: an Inter-agency field manual*. 1999. Available from: <http://www.unhcr.org/refworld/docid/403b6ceb4.html>.
17. Golbasi Z, Taskin L. Evaluation of school-based reproductive health education program for adolescent girls. *Int J Adolesc Med Health*. 2009;**21**(3):395–404. [PubMed: [20014642](https://pubmed.ncbi.nlm.nih.gov/20014642/)].
18. Amouei AA, Asgharnia HA, Khodadadi A. Quantitative and qualitative characteristics of rural solid wastes (babol, iran 2007). *J Babol Univ Med Sci*. 2008;**10**(5):74–80.
19. Shirani-Bidabadi L, Zahraei-Ramazani A, Yaghoobi-Ershadi MR, Rassi Y, Akhavan AA, Oshaghi MA, et al. Assessing the insecticide susceptibility status of field population of *Phlebotomus papatasi* (Diptera: Psychodidae) in a hyperendemic area of zoonotic cutaneous leishmaniasis in Esfahan Province, Central Iran. *Acta Trop*. 2017;**176**:316–22. doi: [10.1016/j.actatropica.2017.08.035](https://doi.org/10.1016/j.actatropica.2017.08.035). [PubMed: [28870534](https://pubmed.ncbi.nlm.nih.gov/28870534/)].
20. Salari MH, Khalili MB, Hassanpour GR. Selected epidemiological features of human brucellosis in Yazd, Islamic Republic of Iran: 1993–1998. *East Mediterr Health J*. 2003;**9**(5–6):1054–60. [PubMed: [16450537](https://pubmed.ncbi.nlm.nih.gov/16450537/)].
21. Iman N, Davood A. QSAR and QSTR study of pyrimidine derivatives to improve their therapeutic index as antileishmanial agents. *Med Chem Res*. 2013;**22**(10):5029–35. doi: [10.1007/s00044-013-0477-8](https://doi.org/10.1007/s00044-013-0477-8).
22. Saberi S, Zamani A, Motamedi N, Nilforoushzadeh MA, Jaffary F, Rahimi E, et al. The knowledge, attitude, and prevention practices of students regarding cutaneous leishmaniasis in the hyperendemic region of the Shahid Babaie Airbase. *Vector Borne Zoonotic Dis*. 2012;**12**(4):306–9. doi: [10.1089/vbz.2010.0259](https://doi.org/10.1089/vbz.2010.0259). [PubMed: [22022818](https://pubmed.ncbi.nlm.nih.gov/22022818/)].
23. Hatmi ZN, Tahvildari S, Gafarzadeh Motlag A, Sabouri Kashani A. Prevalence of coronary artery disease risk factors in Iran: a population based survey. *BMC Cardiovasc Disord*. 2007;**7**:32. doi: [10.1186/1471-2261-7-32](https://doi.org/10.1186/1471-2261-7-32). [PubMed: [17971195](https://pubmed.ncbi.nlm.nih.gov/17971195/)].
24. Maddah M. Overweight among rural girls in Iran: a terrifying prospect of cardiometabolic disorders. *Int J Cardiol*. 2009;**132**(3):442–4. doi: [10.1016/j.ijcard.2007.08.083](https://doi.org/10.1016/j.ijcard.2007.08.083). [PubMed: [18158192](https://pubmed.ncbi.nlm.nih.gov/18158192/)].
25. Bahrami H, Sadatsafavi M, Pourshams A, Kamangar F, Nouraei M, Semnani S, et al. Obesity and hypertension in an Iranian cohort study; Iranian women experience higher rates of obesity and hypertension than American women. *BMC Public Health*. 2006;**6**:158. doi: [10.1186/1471-2458-6-158](https://doi.org/10.1186/1471-2458-6-158). [PubMed: [16784543](https://pubmed.ncbi.nlm.nih.gov/16784543/)].
26. Tavakoli HR, Dini-Talatappéh H, Rahmati-Najarkolaei F, Gholami Fesharaki M. Efficacy of HBM-Based Dietary Education Intervention on Knowledge, Attitude, and Behavior in Medical Students. *Iran Red Crescent Med J*. 2016;**18**(11). e23584. doi: [10.5812/ircmj.23584](https://doi.org/10.5812/ircmj.23584). [PubMed: [28210498](https://pubmed.ncbi.nlm.nih.gov/28210498/)].
27. Falkstedt D, Hemmingsson T. Educational level and coronary heart disease: a study of potential confounding from factors in childhood and adolescence based on the Swedish 1969 conscription cohort. *Ann Epidemiol*. 2011;**21**(5):336–42. doi: [10.1016/j.annepidem.2010.12.005](https://doi.org/10.1016/j.annepidem.2010.12.005). [PubMed: [21458726](https://pubmed.ncbi.nlm.nih.gov/21458726/)].
28. Hamner J, Wilder B. Knowledge and risk of cardiovascular disease in rural Alabama women. *J Am Acad Nurse Pract*. 2008;**20**(6):333–8. doi: [10.1111/j.1745-7599.2008.00326.x](https://doi.org/10.1111/j.1745-7599.2008.00326.x). [PubMed: [18588661](https://pubmed.ncbi.nlm.nih.gov/18588661/)].
29. Karalis IK, Alegakis AK, Kafatos AG, Koutis AD, Vardas PE, Lionis CD. Risk factors for ischaemic heart disease in a Cretan rural population: a twelve year follow-up study. *BMC Public Health*. 2007;**7**:351. doi: [10.1186/1471-2458-7-351](https://doi.org/10.1186/1471-2458-7-351). [PubMed: [18088432](https://pubmed.ncbi.nlm.nih.gov/18088432/)].
30. Kokiwar PR, Rao JG, Shafee MD. Prevalence of coronary risk factors in a rural community of Andhra Pradesh. *Indian J Public Health*. 2009;**53**(1):52–4. [PubMed: [19806833](https://pubmed.ncbi.nlm.nih.gov/19806833/)].
31. Mooney LA, Franks AM. Impact of health screening and education on knowledge of coronary heart disease risk factors. *J Am Pharm Assoc (2003)*. 2011;**51**(6):713–8. doi: [10.1331/JAPhA.2011.010127](https://doi.org/10.1331/JAPhA.2011.010127). [PubMed: [22068192](https://pubmed.ncbi.nlm.nih.gov/22068192/)].
32. Veronesi G, Ferrario MM, Chambless LE, Segal R, Mancina G, Corrao G, et al. Gender differences in the association between education and the incidence of cardiovascular events in Northern Italy. *Eur J Public Health*. 2011;**21**(6):762–7. doi: [10.1093/eurpub/ckq155](https://doi.org/10.1093/eurpub/ckq155). [PubMed: [2107391](https://pubmed.ncbi.nlm.nih.gov/2107391/)].
33. Fallahzadeh H, Dehgani A. Epidemiology of road traffic mortality and injuries in Yazd, Iran during 2003–2008. *Chin J Traumatol*. 2011;**14**(5):293–6. [PubMed: [22118484](https://pubmed.ncbi.nlm.nih.gov/22118484/)].
34. Saadat S, Soori H. Epidemiology of traffic injuries and motor vehicles utilization in the capital of Iran: a population based study. *BMC Public Health*. 2011;**11**:488. doi: [10.1186/1471-2458-11-488](https://doi.org/10.1186/1471-2458-11-488). [PubMed: [21693056](https://pubmed.ncbi.nlm.nih.gov/21693056/)].
35. Rezapur-Shahkolai F, Naghavi M, Shokouhi M, Laflamme L. Unintentional injuries in the rural population of Twisarkan, Iran: a cross-sectional study on their incidence, characteristics and preventability. *BMC Public Health*. 2008;**8**:269. doi: [10.1186/1471-2458-8-269](https://doi.org/10.1186/1471-2458-8-269). [PubMed: [18671856](https://pubmed.ncbi.nlm.nih.gov/18671856/)].
36. Durrani M, Waseem H, Bhatti JA, Razzak JA, Naseer R. Associations of traffic safety attitudes and ticket fixing behaviours with the crash history of Pakistani drivers. *Int J Inj Contr Saf Promot*. 2012;**19**(4):351–6. doi: [10.1080/17457300.2011.635207](https://doi.org/10.1080/17457300.2011.635207). [PubMed: [22132726](https://pubmed.ncbi.nlm.nih.gov/22132726/)].
37. Heydari ST, Hoseinzadeh A, Ghaffarpasand F, Hedjazi A, Zarenezhad M, Moafian G, et al. Epidemiological characteristics of fatal traffic accidents in Fars province, Iran: a community-based survey. *Public Health*. 2013;**127**(8):704–9. doi: [10.1016/j.puhe.2013.05.003](https://doi.org/10.1016/j.puhe.2013.05.003). [PubMed: [23871394](https://pubmed.ncbi.nlm.nih.gov/23871394/)].
38. Ebrahimi M, Mansournia MA, Haghdoost AA, Abazari A, Alaeddini F, Mirzazadeh A, et al. Social disparities in prevalence, treatment and control of hypertension in Iran: second National Surveillance of Risk Factors of Noncommunicable Diseases, 2006. *J Hypertens*. 2010;**28**(8):1620–9. doi: [10.1097/HJH.0b013e32833a38f2](https://doi.org/10.1097/HJH.0b013e32833a38f2). [PubMed: [20647858](https://pubmed.ncbi.nlm.nih.gov/20647858/)].
39. Maleki MR, Delgoshai B, Nasiripour AA, Yaghoobi M. Exploratory and confirmatory factor analysis of health promotion in Iranian hospitals. *Health Med*. 2012;**6**(7):2261–7.
40. Yaghoobi M, Javadi M, Bahadori M, Ravangard R. Health Promoting Hospitals Model in Iran. *Iran J Public Health*. 2016;**45**(3):362–9. [PubMed: [27141499](https://pubmed.ncbi.nlm.nih.gov/27141499/)].