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Lifestyle of Coronary Artery Patients Aged Under and Over 45 Years in Tabriz, Iran: A Comparative Study

Mohammad Hasan Sahebihagh[1], Asghar Mohammadpoorasl[2], Raziyeh Parizad[3*], Elnaz Javanshir[4], Mina Hosseinzadeh[5]

Abstract

Objectives: Cardiovascular diseases (CVDs), especially ischemic heart diseases (IHDs) are one of the most important health-related issues in the world. Lifestyle plays a remarkable role in preventing or developing such diseases. Therefore, given the importance of lifestyle as an influential factor in the incidence of coronary artery disease (CAD) and the rise of these diseases in younger ages, the aim of the current research was to investigate and compare various aspects of patients' lifestyles on developing CAD and subsequently to contrast them with non-affected patients.

Materials and Methods: This study included 368 people who were equally divided into four groups of under 45-years-old coronary and non-coronary disease, as well as 45-years and older coronary and non-coronary disease. The participants were selected by means of the convenience sampling method from Madani heart center and Shohada hospital of Tabriz from March to June 2018. Non-coronary and coronary patients were matched in terms of gender and age (±3 years) and data were collected using a 65-item lifestyle questionnaire through interviews.

Results: The mean lifestyle scores were obtained as 103.02 ± 12.11, 123.83 ± 10.35, 99.25 ± 0.27, and 129.02 ± 10.65 for under 45-years-old coronary patients and their counterpart control group, as well as 45-years-old and older patients and their counterpart control group, respectively. Based on the results, there was a significant difference between coronary patients and non-coronary groups in both age categories ($P < 0.001$). Finally, the comparison of the mean lifestyle scores between the under 45-year-old and the 45-year-old and older groups showed that the two groups only had a significant difference in the subscale physical activity and exercise ($P < 0.001$) and dietary habits ($P = 0.009$).

Conclusions: In general, the risk factors for CAD in both age categories were similar except for lower physical activity and nutrition poorer in 45-year- old individuals. Accordingly, primary and secondary prevention, risk factor control, and promotion of a healthy lifestyle at family and society levels should start from childhood and adolescence.

Keywords: Coronary heart diseases, Lifestyle, Age groups

Introduction

As life expectancy has increased, chronic diseases have posed a substantial health issue. These long-lasting, disabling diseases with incurable pathologies rank the first cause and are responsible for about 60% of mortalities across the world (1). In the past, the focus was to cure diseases, but now, it has been shifted to the prevention, provision, and promotion of health through improving lifestyle and eliminating the factors that have rather adverse effects on human health (2). Chronic diseases are among the major causes of the waste of health funds (3). Examples of chronic diseases are coronary artery diseases (CADs), which are among the most important human health threats (4,5).

CAD varies from asymptomatic ischemia to chronic stable angina, unstable angina, acute myocardial infarction, ischemic cardiomyopathy, and sudden cardiac death and is the most common cause of hospitalizations (6). In addition, they are the most prevalent cause of mortality in developed and developing countries such that they are estimated to account for 40%-45% of the causes of mortality. Further, they are gaining importance in developing countries where contagious diseases are controllable (7,8). The global burden of such diseases is more on low and intermediate income countries that are responsible for 78% and 86.2% of all deaths and disabilities, respectively (9). More importantly, in recent years, the onset age of developing coronary diseases has had an alarming decrease such that the youth and middle-aged constitute a significant number of victims, which is a disaster for families and a heavy burden on the economy (10-12) More than 148 thousand people aged under 65 years old died from CAD in the United States in 2004 (13). The average age of heart attacks is approximately 60, but there has been a greater increase in recent years in the rate of heart attacks in young. Approximately 4 to

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[1]Tabriz Health Services Management Research Center, Health Management and Safety Promotion Research Institute and Department of Community Health Nursing, Tabriz University of Medical Sciences, Tabriz, Iran. [2]Tabriz Health Services Management Research Center, Tabriz University of Medical Sciences, Tabriz, Iran. [3]Student Research Committee and Faculty of Nursing and Midwifery, Tabriz University of Medical Sciences, Tabriz, Iran. [4]Department of Cardiology, Cardiovascular Research Center, Tabriz University of Medical Sciences, Tabriz, Iran. [5]Department of Community Health Nursing, Faculty of Nursing and Midwifery, Tabriz University of Medical Sciences, Tabriz, Iran.
*Corresponding Author: Raziyeh Parizad, Email: r_parizad2003@yahoo.com

10% of heart attack patients are under 45 years of age (14). These diseases can result in hospitalization, disability, and declined quality of life. The economic burden of CAD is also substantial such that the costs of such diseases were estimated 315 million dollars in the United States in 2010. Further, these costs are expected to rise to 888 billion dollars by 2030 (15). Statistics suggest a high prevalence in Iran, and more precisely, 19.4% of the Iranian population suffer from CAD (3,16,17). This accounts for 46% of the causes of mortality and 116 thousand people die each year because of coronary diseases (18). The incidence of CAD is also rising in younger ages in Iran (14,19) although its causes need further investigation. One important factor may be an unhealthy lifestyle.

Lifestyle reflects one's attitude toward life, the world, and his or her acceptable values. In other words, lifestyle is a symbol of guiding the people of a community that encompasses all aspects of their lives (20). Indeed, it constitutes daily activities embraced by people in their lives in a way that these activities influence their health (21). Therefore, a healthy lifestyle has a remarkable impact on the physical and mental health of people and society and, ultimately, will result in improved quality of life (22).

Ischemic heart diseases (IHDs) are increasingly rising in the youth and, on the other hand, elderly people will be a significant population weight in the future whose aspects of lives, especially their health, require due attention. More importantly, almost 70% of the deaths from heart diseases can be prevented by modifications to lifestyle (23). One of the ways of collecting information about the public health of a community is to obtain information about the main risk factors for a disease, and modifying pathological behaviors and encouraging a healthy lifestyle are among the methods of health promotion (24).

Although numerous studies have focused on CAD among different age groups, no comparative study is available, at least in Iran, regarding comparing "young", "middle-aged", and "elderly" age groups. Accordingly, the present study was carried out to explore the aspects of lifestyle (i.e., dietary habits, physical activity, tobacco use, mental health, and the ways of their modification) in under and over 45-year-old CAD patients.

Materials and Methods

This descriptive, cross-sectional study was performed in Tabriz in 2018. The research population consisted of four groups including under 45-year-old with coronary (case group I) and non-coronary (control group I) disease, as well as 45-year-old and older with (case group II) and without (control group II) coronary disease. The coronary groups were selected from patients who were admitted to the Madani heart center of Tabriz based on CAD diagnosis. Furthermore, the non-coronary groups were randomly selected from those admitted to the Shohada hospital of Tabriz and CAD was ruled out for them. They had a ±3 age variation and were matched with CAD patients in terms of age and gender.

Inclusion and Exclusion Criteria

Case group's inclusion criteria: Patients who had been hospitalized for the first time following the definitive diagnosis with CAD by a cardiovascular specialist.

Control group's inclusion criteria: Patients hospitalized for incidents and accidents, no finding in favor of CAD in the electrocardiogram and test results, and no cases of hypertension (BP>140/90) and diabetes. All patients were interested to be a part of the study.

Exclusion Criteria

1. Having congenital cardiac disease;
2. Having mental diseases or taking medications as noted by medical files or patients' own reports.

The sample size was calculated as 368 cases (there were 92 people in each group). CAD patients were selected from those who had been in their first 24 hours of hospitalization. The control groups were not selected from the relatives of these patients since their lifestyles were the same and this would distort the results.

The convenience sampling technique was conducted from March to June 2018. The data collection tool was the lifestyle questionnaire developed by Esmaili (25), which was rechecked for validity and reliability. It consisted of two parts. The first part belonged to demographic information and risk factors for CAD and the second part measured six areas such as dietary habits, physical activity and exercise, tobacco use, sleep and rest pattern, stress, and stress-coping strategies. Moreover, content validity was utilized to verify the validity of the questionnaire. The corrective opinions of 15 nursing professors and cardiovascular specialists were applied to improve the tool, followed by calculating reliability at 0.75 Cronbach's alpha. Additionally, the four-point Likert-type scale (0= never, 1= barely, 2= often, 3= always) was the basis for scoring in this part of the questionnaire, and reverse scoring was used for reverse items. The total score of the six domains was one's lifestyle score. The higher score represented a better and healthier lifestyle.

Data collection began by reviewing the clinical files of the patients. Those interested patients completed the questionnaire through interviews in their rooms in non-visiting and non-care hours. The collected data were imported to SPSS, version 24, and statistical analysis was conducted by means of descriptive statistics (mean and standard deviation). Finally, the mean scores were compared across coronary and non-coronary patients under 45 and 45 years old and older for each subscale using the independent *t* test, χ^2, paired sample *t* test, one-way ANOVA, and Pearson correlation.

Results

Based on the results, no significant difference existed between the under 45-year-old case and control groups

in relation to marital status, education, residence, and the history of alcohol and drug use. However, regarding the history of hypertension ($P<0.001$), diabetes ($P<0.001$), and the body mass index (BMI, $P=0.042$), the difference was significant (Table 1). The results further revealed that the percentage of individuals with hypertension and diabetes was higher in both case groups compared to their counterpart control groups. The mean BMI score of the case group II was higher than that of the control group II, but the reverse was true in the case group I and the control group I. In addition, the highest frequency of unstable angina was in the under 45-year-old coronary patients (n = 54, 58.7%).

In the 45-years-old and older age group, no significant difference was found between the case and control groups in terms of education, residence, and the history of alcohol use, and BMI although the difference in marital status ($P=0.023$), history of drug use ($P=0.003$), hypertension ($P<0.001$), and diabetes ($P=0.001$) was significant (Table 1). The percentage of hypertensive and diabetic patients was higher in both case groups (I and II). In coronary patients, most patients were married instead of being single, widowed, and divorced. The largest number of CAD in both age categories was related to unstable angina (n=48, 52.2%).

The *t* test results regarding comparing the mean scores of lifestyle in case and control groups in both age groups revealed a significant difference in terms of each subscale of lifestyle and the total lifestyle score ($P<0.001$), the details of which are presented in Table 2. The independent *t* test was employed to compare the difference between the lifestyle mean score in under 45 and 45-year-old and older patients although its findings only suggested a significant difference in the subscales of physical activity and exercise ($P=0.001$) and dietary habits ($P=0.009$). The independent *t* test was also used to compare the lifestyle mean scores of the under 45 and 45-year-old and older control groups. Based on the results (Table 2), the two groups demonstrated significant differences in the subscales of dietary habits ($P<0.001$), sleep and rest ($P=0.001$), and the lifestyle total mean scores ($P=0.001$).

Contrarily, there was no significant relationship between the lifestyle mean score and gender, marital status, residence, and age (r=-0.022), but the relationship between education and the lifestyle mean score was significant ($P<0.001$). In other words, higher education led to an increase in the lifestyle mean score, the related data are shown in Table 3.

Discussion

In general, the findings of this study revealed a significant difference between the under 45-year-old case and control groups and between the 45-year-old and older case and control groups in terms of the subscale mean scores and the total mean score of lifestyle ($P<0.001$). Eftekhar et al (26) reported a significant difference in lifestyle mean scores between IHD patients (mean age = 63.1 years) and their counterpart control group (mean age = 45.6 years).

Table 1. Comparison of the Demographic Information and Risk Factors in Coronary Patients and Their Counterpart Control Groups

Variable		Case Group I, No. (%)	Control Group I, No. (%)	*P* Value	Case Group II, No. (%)	Control Group II, No. (%)	*P* Value
Gender	Male	53 (57.6)	53 (57.6)	1.000	50 (54.3)	50 (54.3)	1.000
	Female	39 (42.4)	39 (42.4)		42 (45.7)	42 (45.7)	
Marital status	Single	22 (23.9)	19(20.7)	0.109	2 (2.2)	10 (10.69)	0. 969
	Married	70 (76.1)	73 (79.3)		90 (97.8)	82 (89.1)	
Education	Uneducated	9 (9.8)	6 (6.5)	0.428	27 (29.3)	22 (23.9)	0.705
	High school/diploma/lower	61 (66.3)	57 (62)		55 (59.8)	59 (64.1)	
	University degree	22 (24)	29 (31.4)		10 (10.9)	11 (11.9)	
Residence	Tabriz	42 (45.7)	46 (50)	0.540	48 (52.2)	44 (47.8)	0.476
	County	39 (42.4)	32 (34.8)		36 (39.1)	43 (46.7)	
	Rural	11 (12.0)	14 (15.2)		8 (8.7)	5 (5.4)	
History of alcohol use	Yes	9 (9.8)	5 (5.4)	0.203	4 (4.3)	2 (2.2)	0.341
	No	83 (90.2)	87 (94.6)		88 (95.7)	90 (97.8)	
History of drugs abuse	Yes	3 (3.3)	3 (3.3)	1.000	8 (8.7)	0 (0)	0.003
	No	89 (96.7)	89 (96.7)		84 (91.3)	92 (100)	
History of Hypertension	Yes	47 (51.1)	23 (25.0)	<0.0001	63 (68.5)	33 (37.0)	<0.0001
	No	45 (48.9)	69 (75)		29 (31.5)	59 (64.1)	
History of Diabetes	Yes	29 (31.9)	6 (6.5)	<0.0001	30 (32.6)	12 (13.0)	<0.0001
	No	63 (68.5)	86 (93.5)		62 (67.4)	80 (87)	
Age (mean ± SD)		34.8 ± 6.71	34.6 ± 7.17	0.857	55.7 ± 8.54	54.70 ± 6.76	0.443
BMI (mean ± SD)		27.44 ± 2.67	28.29 ± 2.99	0.042	27.29 ± 3.10	26.4 ± 3.33	0.061

Note. SD: Standard deviation; BMI: Body mass index; Group 1: Under 45-years-old, coronary patients (case I) and non-coronary patients (control I); Group 2: 45-years-old, coronary patients (case II) and non-coronary patients (control II).

Table 2. Comparison of the Lifestyle Mean Scores of Coronary Patients and Their counterpart Control Groups

Variable	Case Group I	Control Group I	*P* Value	Case Group II	Control Group II	*P* Value	*P**	*P***
	Mean ± SD	Mean ± SD		Mean ± SD	Mean ± SD			
Dietary habits	44.33 ± 6.66	50.15± 4.88	< 0.001	41.61 ± 7.22	53.30± 5.37	< 0.001	0.009	< 0.001
Physical activity and exercise	2.98 ± 1.79	3.97 ± 1.83	< 0.001	1.85 ± 1.60	4.00 ± 1.54	< 0.001	< 0.001	0.931
Tobacco use	10.79 ± 4.31	14.01± 2.66	< 0.001	10.63 ± 4.65	13.72 ± 1.95	< 0.001	0.806	0.405
Sleep and rest	12.10 ± 2.64	15.56 ± 2.67	< 0.001	11.85 ± 3.16	16.83 ± 2.35	< 0.001	0.562	< 0.001
Stress	16.25 ± 3.16	18.60 ± 3.34	< 0.001	15.75 ± 3.64	18.86 ± 3.10	< 0.001	0.322	0.584
Stress-coping strategies	16.54 ± 3.81	21.51 ± 3.97	< 0.001	17.53 ± 4.30	22.28 ± 3.33	< 0.001	0.101	0.150
Total lifestyle	103.02 ± 12.11	123.83 ± 10.35	< 0.001	99.25 ± 15.39	129.02 ± 10.65	< 0.001	0.066	< 0.001

Note. SD: standard deviation.

* Significance is related to the comparison of the lifestyle scores in under 45 and over 45 case groups.

** Significance is related to the comparison of lifestyle scores in under 45 and over 45 control groups.

Table 3. The Relationship Between the Demographic Variables and the Lifestyle Mean Scores of Coronary Patients and Their Counterpart Control Groups

Variable		Case Group I		Control Group I		Case Group II		Control Group II	
		Mean ± SD	*P*	Mean ± SD	*P*	Mean ± SD	*P*	Mean ± SD	*P*
Gender	Male	102.56 ± 13.14	0.677	122.58 ± 9.29	0.180	97.24 ± 17.23	0.173	127.96 ± 11.20	0.299
	Female	103.64 ± 10.69		125.52 ± 11.55		101.64 ± 12.64		130.28 ± 9.93	
Marital status	Single	100.65 ± 9.89		122.47 ± 8.92		99.33 ± 15.55		129.15 ± 10.68	
	Married	103.64± 12.82	0.611	124.17 ± 10.45	0.794	95.50 ± 1.41	0.730	123.00 ± 9.19	0.422
	Widowed/divorced	105.00± 2.12		125.50 ± 25.45		99.25 ± 15.39		129.02 ± 10.65	
Education	Uneducated	101.55 ± 5.71		127.83 ± 13.69		98.14 ± 14.11		132.51 ± 9.26	
	High school Diploma and lower	100.92 ± 10.99	0.016	125.16 ± 10.10	0.015	97.18 ± 14.67	0.006	126.66 ± 10.55	0.033
	University degree	109.43 ± 14.88		118.50 ± 7.71		113.60 ± 16.38		132.55 ± 12.09	
Residence	Tabriz	102.69 ± 14.66		123.42 ± 9.33		100.17 ± 15.09		129.94 ± 11.02	
	County	104.28 ± 9.21	0.548	124.29 ± 11.46	0.933	96.59 ± 15.15	0.273	127.94 ± 10.75	0.686
	Rural	99.81± 10.65		123.72 ± 10.82		105.62 ± 17.69		128.31 ± 8.23	
Age			0.305		0.266		0.990		0.600

Note. SD: standard deviation.

In another study, Hekari et al (27) also found a statistically significant difference between the lifestyle scores of female coronary patients and non-coronary patients (mean age = 60.23 years, ($P < 0.001$). More precisely, 60% of coronary patients had an "average" lifestyle while only 1.1% enjoyed a "very good" lifestyle ($P < 0.05$). The present results also confirm those of Sedaghat et al (28) and Shahsavari et al (29).

According to Karkhah et al (30), the results of epidemiological studies showed that unhealthy lifestyle, smoking, sedentariness, high alcohol use, poor diet, and not being of ideal weight result in an approximately 20% risk of CAD. The American Heart Association has recognized lifestyle as an important predisposing factor for disease and mortality in the US and attributes around 70% of all physical and mental diseases to lifestyle (31). Moreover, the provided information by some studies suggests that a healthy lifestyle, including no smoking, healthy diet, obesity prevention, physical activity, and no alcohol use, prevents cardiovascular diseases (CVDs) up to 80% (32-34).

In their study regarding the effect of education on lifestyle among patients suffering from IHD, Nasrabadi et al (35) examined a case group (mean age = 52.30 years) and a control group (mean age = 51.86 years) and reported a significant difference between the two groups in the posttest total mean scores of lifestyle ($P < 0.001$).

It may be argued that amending the lifestyles of people of all ages is necessary for the improvement of their physical and mental status. This can be achieved through education and culture building, and the incidence and severity of diseases can be highly prevented by modifying lifestyle.

In this study, the number of individuals with hypertension and diabetes in coronary patients was higher in both under 45 and 45-year-old and older age groups compared to non-coronary patients. Nadeem et al, in their study on under 45-year-old cardiac patients, reported high blood lipids, diabetes, and high BMI as the major causes of developing hypertension (36). Similarly, Ianula referred to smoking, high blood lipids, obesity, and hypertension as the causes of cardiac diseases among the youth (37). Morillas et al also studied under 45-year-old patients with myocardial infarction (MI) and then compared them

with over 45 individuals. They found that smoking and hypercholesterolemia were more common among young patients ($P<0.0001$) while hypertension, diabetes, along with the history of CAD and lower physical activity were more common among senior patients (38). In another study, Parizad et al evaluated acute coronary syndrome and cardiovascular risk factors in women of reproductive age in northwest Iran and reported hypertension, diabetes, hyperlipidemia, and smoking as the risk factors for CAD (39). Therefore, the prevention of these conditions at any age can be influential in CAD prevention.

In this study, under 45-year-old coronary patients had smaller BMI, which is consistent with the results of Abedi et al (54) and Park et al (40), but contradicts those of Park et al (41) and Nasrabadi et al (35). Low BMI patients had the higher risk of developing coronary diseases compared to the control group, which is probably attributed to decreasing muscle mass, less physical activity, and wrong habits like smoking and unhealthy nutrition (42). Our study showed lower BMI in the young case group compared to the control group, which can be considered as a new risk factor for CAD in young people, which corroborates with the findings of previous studies (43,44).

The comparison of the lifestyle mean scores of coronary patients in both age groups revealed a significant difference in physical activity and exercise ($P<0.001$) and dietary habits ($P=0.009$) such that physical activity and nutrition were poorer in 45-year-old and older patients. No other study on under 45 and 45-year-old and older patients was found to compare the results. Therefore, it is necessary to modify lifestyle in both age groups and enhance the physical activity and nutrition of elderly people.

Eftekhar et al (26) also reported significantly less physical activity in patients with IHD in comparison to healthy individuals ($P<0.013$). Likewise, Garber conducted a one-year follow-up study on the most common risk factors for inactivity, including sedentary jobs and the correction of physical activities and demonstrated that proper intervention significantly increased the physical activity and lowered sedentariness in patients with type 2 diabetes (45). Rezabeigi Davarani et al (2016) also concluded that the lack of physical activity was the second risk factor for CVD (46).

In their studies on risk factors of CVD in elderly patients, Hosseini et al found that 67.3% of subjects did not go walking and 88.6% did not do exercise (47). Exercise in the elderly reduces the incidence of the risk factors of CVD, including fatness, hypertension, and diabetes (48). Furthermore, sedentariness is the cause of 30% of IHD (49). Moreover, Koertge et al showed that physical activity is the most important aspect of the lifestyle of elderly people with CAD (50). Sezavar et al also reported lower physical activity in young patients with MI compared to the control group (51).

The American College of Surgeons and the American College of Sports Medicine reported that regular physical activities for at least 30 minutes a day can prevent CAD. Walking also can reduce the risk of heart diseases by affecting physical fitness, physical functioning, and the high-density lipoprotein level (52).

According to a British study on elderly CVD patients, light and mediate physical activities including regular walking, frequent recreational activities, sports activities such as swimming and jogging were significantly effective in reducing mortality (53). Recent observational studies also have shown that exercise reduces the risk of death from CVD by 25-30% (54, 55). Physical activities play a pivotal role in the quality of life and health of people in older ages and those with high physical activities will have a healthier life in their old age and will be at less risk of developing CAD (56).

On the other hand, unfavorable changes in lifestyle such as dietary habits, along with declined physical activities may increase CAD-related mortality.

Aldana et al examined the impact of nutrition as the only dimension effective on the lifestyle of cardiac patients and found a statistically significant difference in the experimental group as opposed to the control group (57). In another study, Refahi et al reported that the subjects did not have a favorable nutritional status (58).

Therefore, to confront unhealthy dietary habits as a risk factor for CVDs, the consumption of fast foods, the correction of other improper dietary habits and behaviors, and health education should be the priorities of informing and creating the right attitude which will consequently result in the right dietary habit (59).

The comparison of the lifestyle mean scores of under 45 and 45-year-old and older control groups revealed a significant difference with a lower mean score in the under 45-year-old group. No other study was found in relation to this issue. Machine-like life, little physical activity, the increased consumption of fast foods, and a change in the dietary habits of the youth might be the relevant causes and if confirmed, one should expect more widespread CAD for the decades ahead.

In this study, there was a significant relationship between the lifestyle mean score and education in all groups, which is compatible with the results of Kapelios et al (60) and Hasanpour et al (61) but contradicts those of Karimi et al (62) and Banifatemeh et al (63). Such discrepancy may be attributed to the type of study population. Education has a remarkable impact on people's health and lower education indicates the possibility of unawareness to enjoy a healthy and proper lifestyle. Moreover, education can enable people to make changes in their lifestyle (64) so that patients will be able to prevent the recurrence of disease and healthy people will act as a preventive manner.

Based on the reports of Haskell in the study in the United States on the prevention of CAD and efficiency of interventions involved in the lifestyle, engaging frequent physical activities, having a healthy diet, maintaining a healthy weight, and avoiding stress are the vital parts of a

program to prevent CAD in addition to quitting smoking. People with a high risk of developing heart diseases (those with hypertension, high lipids, and diabetes) should both take medication and change their lifestyles (65).

Conclusions

The lifestyles of the CAD patients in both age groups (under 45 and 45 and older) were different from those of the counterpart control groups. On the other hand, the risk factors were the same across the age groups except for physical activity which could be related to the physical disability of the 45-year-old and older group. Given the similarity of risk factors and the initiation of CAD at childhood age, it may be argued that interventions for the risk factors of CAD should be developed from childhood and adolescent ages by means of primary and secondary preventions through lifestyle modifications in order to promote the health of society. It is also necessary to promote through education healthy dietary habits, proper physical activities, and normal mental atmospheres, especially in families. On the other hand, the comparison of the lifestyles across both age groups showed that it is necessary to increase activities in the middle-aged and elderly people in order to reduce the risk factors for CAD. The prevention of diseases and disabilities is easier and less costly than treatments. In addition to reductions in the enormous costs of therapies and the occupation of hospital beds, it will improve people's health. Therefore, it is also essential to ask people to cooperate and inform them about the outcomes of an unhealthy lifestyle. Eventually, the future exploration of the issues in the form of cohort studies on various parts of the society can help us control the factors that play an influential role in people's health.

Limitations of the Study

Our study had some limitations. The results were based on patients' self-reports. Moreover, post-illness and hospitalization stress and anxiety, as well as personal, social, and cultural differences and psychological traits might have influenced participants' responses to the questions thus recall bias was more probable.

Conflict of Interests

Authors have no conflict of interests.

Ethical Issues

The research proposal was approved by the Research Council of the Department and Faculty of Nursing and Midwifery, as well as the Regional Ethics Committee of Research at Tabriz University of Medical Sciences (No. IR.TBZMED.REC.1397.007).

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References

1. Clark NM, Gong M, Kaciroti N. A model of self-regulation for control of chronic disease. Health Educ Behav. 2014;41(5):499-508. doi:10.1177/1090198114547701
2. Mann DL. Braunwald's Heart Disease: A Textbook of cardiovascular medicine. Philadelphia, US: Elsevier Health Sciences; 2014.
3. Suzman R, Beard J. Global health and ageing. World Health Organization; 2011. http://library.bsl.org.au/jspui/bitstream/1/3411/1/Global%20Health%20%26%20Ageing_WHO%202011.pdf.
4. Khaledifar A, Bahonar A, Asadilari M, et al. Risk factors of cardiovascular diseases in a worker population in Isfahan province. ARYA Atheroscler. 2012;7:82-87.
5. Mendis S, Puska P, Norrving B. Global Atlas on Cardiovascular Disease Prevention and Control. Geneva: World Health Organization; 2011.
6. Hecht SM. A Review of: "Harrison's Manual of Medicine. 17th ed. Fauci, Anthony S.; Braunwald, Eugene; Kasper, Dennis L. et al., eds." Medical Reference Services Quarterly. 2010;29(1):103-104.
7. Arizona WHA. Cardiovascular disease risk factor. https://www.world-heart-federation.org/resources/risk-factors/.
8. Löfvenmark C, Saboonchi F, Edner M, Billing E, Mattiasson AC. Evaluation of an educational programme for family members of patients living with heart failure: a randomised controlled trial. J Clin Nurs. 2013;22(1-2):115-126. doi:10.1111/j.1365-2702.2012.04201.x
9. Kazemi T, Sharifzadeh GR, Zarban A, Fesharakinia A, Rezvani MR, Moezy SA. Risk factors for premature myocardial infarction: a matched case-control study. J Res Health Sci. 2011;11(2):77-82.
10. Rezaian M, Dehdari A, Tabatabaie SZ. Age and sex patterns of deaths due to cardiovascular diseases in Kerman province. Homaye Saadat. 2012;8(4):45. [Persian].
11. Koohi F, Salehiniya H, Mohammadian Hafshejani A. Trends in mortality from cardiovascular disease in Iran from 2006-2010. Journal of Sabzevar University of Medical Sciences. 2015;22(4):630-638. [Persian].
12. Rashidi M, Ghias M, Ramesht MH. Geographical epidemiology of death due to cardiovascular diseases in Isfahan povince, Iran. Journal of Isfahan Medical School. 2011;29(125):13-19. [Persian].
13. Perdikaris P, Kletsiou E, Gymnopoulou E, Matziou V. The relationship between workplace, job stress and nurses' tobacco use: a review of the literature. Int J Environ Res Public Health. 2010;7(5):2362-2375. doi:10.3390/ijerph7052362
14. Grassi C, Landi F, Delogu G. Lifestyles and ageing: targeting key mechanisms to shift the balance from unhealthy to healthy ageing. Stud Health Technol Inform. 2014;203:99-111. dio:103233/978-1061499-425-1-99
15. Go AS, Mozaffarian D, Roger VL, et al. Executive summary: heart disease and stroke statistics--2014 update: a report from the American Heart Association. Circulation. 2014;129(3):399-410. doi:10.1161/01.

cir.0000442015.53336.12
16. Fowkes FG, Rudan D, Rudan I, et al. Comparison of global estimates of prevalence and risk factors for peripheral artery disease in 2000 and 2010: a systematic review and analysis. Lancet. 2013;382(9901):1329-1340. doi:10.1016/s0140-6736(13)61249-0
17. Naghavi M. Transition in health status in the Islamic Republic of Iran. Iranian Journal of Epidemiology. 2006;2(1):45-57. [Persian].
18. Nagavi M. The viewpoint of diseases and mortalities in 18 country of Iran in 1990. Tehran: Ministry of Health Care and Medical Education; 2002.
19. Chan MY, Woo KS, Wong HB, Chia BL, Sutandar A, Tan HC. Antecedent risk factors and their control in young patients with a first myocardial infarction. Singapore Med J. 2006;47(1):27-30.
20. Dalvandi A. Reviewand perspectives, experiences and perceptions of teachers, Clergymen and students of the Islamic Culture about health-oriented lifestyles. Tehran Univ Soc Welfare Rehabil Sci. 2012;7(5):98-116.
21. Tol A, Tavassoli E, Shariferad G, Shojaezadeh D. The relation between health-promoting lifestyle and quality of life in undergraduate students at school of health, Isfahan University of Medical Sciences. Journal of Health System Research. 2011;7(4):442-448. [Persian].
22. Dao-Tran TH. Stressful life events, modifiable lifestyle factors, depressive symptoms, health-related quality of life, and chronic disease among older women in Vietnam and Australia: a cross-cultural comparison [thesis]. Queensland University of Technology; 2017.
23. Chow CK, Redfern J, Hillis GS, et al. Effect of Lifestyle-Focused Text Messaging on Risk Factor Modification in Patients With Coronary Heart Disease: A Randomized Clinical Trial [published correction appears in JAMA. 2016 Mar 8;315(10):1057]. JAMA. 2015;314(12):1255-1263.
24. Lowdermilk DL, Perry SE, Bobak IM, eds. Maternity and Women's Health Care. 7th ed. St Louis: Mosby Co; 2000:359-360.
25. Esmaili N. Lifestyle of hospitalized patients with coronary heart disease in the Lavasani hospital in Tehran [thesis]. Tabriz: Tabriz University of Medical; 2006.
26. Eftekhar Ardebili H, Rahimi Foroushani A, Barkati H, Babaei Heydarabadi A, Ashrafi Hafez A, Omrani A. Evaluation of correlation between lifestyle and Morbidity of Ischemic heart disease. Journal of Faculty of Nursing and Midwifery, Shahid Beheshti University of Medical Sciences and Health Services. 2013;23(81):47-54. [Persian].
27. Hekari D, Mohammadzadeh R, Khajavikia H, Zarei S. Comparing lifestyle between menopause women with and without coronary heart diseases during 2010-2011. Medical Science Journal of Islamic Azad Univesity-Tehran Medical Branch. 2012;22(1):69-77. [Persian].
28. Sedaghat Z, Zibaeinejad MJ, Fararouei M. Adherence to healthy lifestyle among hypertensive patients and its association with anthropometric measures. Iranian Journal of Health Education and Health Promotion. 2015;3(3):232-241. [Persian].
29. Shahsavari S, Nazari F, Karimyar Jahromi M, Sadeghi M. Epidemiologic study of hospitalized cardiovascular patients in Jahrom hospitals in 2012- 2013. Cardiovascular Nursing Journal. 2013;2(2):14-21. [Persian].
30. Karkhah A, Saadi M, Nouri HR. In silico analyses of heat shock protein 60 and calreticulin to designing a novel vaccine shifting immune response toward T helper 2 in atherosclerosis. Comput Biol Chem. 2017;67:244-254. doi:10.1016/j.compbiolchem.2017.01.011
31. St Jeor ST, Howard BV, Prewitt TE, Bovee V, Bazzarre T, Eckel RH. Dietary protein and weight reduction: a statement for healthcare professionals from the Nutrition Committee of the Council on Nutrition, Physical Activity, and Metabolism of the American Heart Association. Circulation. 2001;104(15):1869-1874. doi:10.1161/hc4001.096152
32. Akesson A, Larsson SC, Discacciati A, Wolk A. Low-risk diet and lifestyle habits in the primary prevention of myocardial infarction in men: a population-based prospective cohort study. J Am Coll Cardiol. 2014;64(13):1299-1306. doi:10.1016/j.jacc.2014.06.1190
33. Karkhah A, Amani J. A potent multivalent vaccine for modulation of immune system in atherosclerosis: an in silico approach. Clin Exp Vaccine Res. 2016;5(1):50-59. doi:10.7774/cevr.2016.5.1.50
34. Kasper D, Hauser S, Lango D, Jameson J, Loscalzo J. Harrison's Principles of Internal Medicine Cardiovascular Disorders. New York: McGraw-Hill; 2015.
35. Nasrabadi T, Goodarzi Zadeh N, Shahrjerdi AR, Hamta A. The effect of education on life style among patients suffering from ischemic heart disease. Journal of Mazandaran University of Medical Sciences. 2010;20(79):72-79. [Persian].
36. Nadeem M, Ahmed SS, Mansoor S, Farooq S. Risk factors for coronary heart disease in patients below 45 years of age. Pak J Med Sci. 2013;29(1):91-96. doi:10.12669/pjms.291.2828
37. Ianula R. Correlation between lifestyle and ischemic heart disease in young patient. Romanian Statistical Review. 2015;4:82-93.
38. Morillas PJ, Cabadés A, Bertomeu V, et al. [Acute myocardial infarction in patients under 45 years]. Rev Esp Cardiol. 2002;55(11):1124-1131. doi:10.1016/s0300-8932(02)76774-2
39. Parizad R, Chenaghlou M, Namdar H. Evaluation of acute coronary syndrome and cardiovascular risk factors in women of reproductive age in Northwest Iran. International Journal of Women's Health and Reproduction Sciences. 2015;3(1);56-60. [Persian].
40. Abedi H, Bik Mohammadi S, Abdeyazdan G, Nazari H. A survey on the the lifestyle of the heart desease patients after discharge from hospital in Urmia Seyyed Alshohada in 1391. The Journal of Urmia Nursing and Midwifery Faculty. 2014;11(12):944-954. [Persian].
41. Park D, Lee JH, Han S. Underweight: another risk factor for cardiovascular disease?: a cross-sectional 2013 Behavioral Risk Factor Surveillance System (BRFSS) study of 491,773 individuals in the USA. Medicine (Baltimore). 2017;96(48):e8769. doi:10.1097/md.0000000000008769
42. Lopez-Jimenez F, Wu CO, Tian X, et al. Weight change after myocardial infarction--the Enhancing Recovery in Coronary Heart Disease patients (ENRICHD) experience. Am Heart J. 2008;155(3):478-484. doi:10.1016/j.ahj.2007.10.026
43. Mora S, Yanek LR, Moy TF, Fallin MD, Becker LC, Becker DM. Interaction of body mass index and framingham risk score in predicting incident coronary disease in families. Circulation. 2005;111(15):1871-1876. doi:10.1161/01.cir.0000161956.75255.7b

44. Sahin S, Eroglu M, Selcuk S, et al. Intrinsic factors rather than vitamin D deficiency are related to insulin resistance in lean women with polycystic ovary syndrome. Eur Rev Med Pharmacol Sci. 2014;18(19):2851-2856.
45. Garber CE. The benefits of physical activity on coronary heart disease and coronary heart disease risk factors in women. Womens Health Issues. 1997;7(1):17-23. doi:10.1016/S1049-3867(96)00024-2
46. Rezabeigi Davarani E, Iranpour A, Khanjani N, Mohseni M, Nazari Robati F. Cardiovascular diseases risk factors and the relationship between knowledge level and preventive behaviors for cardiovascular diseases among women in Kerman. Journal of Health Based Research. 2016;2(2):119-132. [Persian].
47. Hosseini SR, Zabihi A, Bijani A. Prevalence of cardiovascular risk factors in elderly population in Amirshahr (2007). Salmand: Iranian Journal of Ageing. 2009;4(11):46-52. [Persian].
48. Lavie CJ, Milani RV. Effects of cardiac rehabilitation and exercise training programs in patients > or = 75 years of age. Am J Cardiol. 1996;78(6):675-677. doi:10.1016/s0002-9149(96)00393-1
49. Azizi F. Faulty lifestyle: mechanisms, prevention and coping. Iranian Journal of Endocrinology and Metabolism. 2010;12:321-323. [Persian].
50. Koertge J, Weidner G, Elliott-Eller M, et al. Improvement in medical risk factors and quality of life in women and men with coronary artery disease in the Multicenter Lifestyle Demonstration Project. Am J Cardiol. 2003;91(11):1316-1322. doi:10.1016/s0002-9149(03)00320-5
51. Sezavar SH, Aminisani N, Alavizadeh SA. Risk factors for myocardial infarction in young adults: a case-control study. Journal of Ardabil University of Medical Sciences. 2004;4(13):51-55. [Persian].
52. Haskell WL, Lee IM, Pate RR, et al. Physical activity and public health: updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. Med Sci Sports Exerc. 2007;39(8):1423-1434. doi:10.1249/mss.0b013e3180616b27
53. Wannamethee SG, Shaper AG, Walker M. Physical activity and mortality in older men with diagnosed coronary heart disease. Circulation. 2000;102(12):1358-1363. doi:10.1161/01.cir.102.12.1358
54. Agarwal SK. Cardiovascular benefits of exercise. Int J Gen Med. 2012;5:541-545. doi:10.2147/IJGM.S30113.
55. Sclavo M. [Cardiovascular risk factors and prevention in women: similarities and differences]. Ital Heart J Suppl. 2001;2(2):125-141.
56. Vagetti GC, Barbosa Filho VC, Moreira NB, Oliveira V, Mazzardo O, Campos W. Association between physical activity and quality of life in the elderly: a systematic review, 2000-2012. Braz J Psychiatry. 2014;36(1):76-88. doi:10.1590/1516-4446-2012-0895
57. Aldana SG, Whitmer WR, Greenlaw R, et al. Cardiovascular risk reductions associated with aggressive lifestyle modification and cardiac rehabilitation. Heart Lung. 2003;32(6):374-382. doi:10.1016/s0147-9563(03)00106-7
58. Refahi S, Shamsi A, Ebadi A, Saeeid Y, Moradi A. Comparison of military and civilian life style of people with hypertension. Journal of Health Promotion Management. 2012;1(4):43-50. [Persian].
59. Mohammadi Zeidi E, Heidarnia A, Hajizadeh R. Lifestyle of cardiovascular disease. Daneshvar Medicine. 2005;61(13):49-56. [Persian].
60. Kapelios CJ, Kyriazis I, Ioannidis I, Dimosthenopoulos C, Hatziagelaki E, Liatis S. Diet, life-style and cardiovascular morbidity in the rural, free living population of Elafonisos island. BMC Public Health. 2017;17(1):147. doi:10.1186/s12889-017-4053-x
61. Hasanpour L, Zohari Anboohi S, Safari M, Naderiravesh N, Khodakarim S. Factors associated with nurses' lifestyles in nurses of Tehran hospitals in 2012. Advances in Nursing and Midwifery. 2016;25(91):65-73. [Persian].
62. Karimi S, Afkhaminia F, Talebpour Amiri F. Study of different dimensions of lifestyle and some of the factors associated with it in employees of Mazandaran University of Medical Sciences in 2017. Journal of Health Research in Community. 2018;3(4):63-74. [Persian].
63. Banifatemeh H, Shahamfar J, Alizadeh Aghdam MB, Abdi B. Health status, education and gender: effects on people's awareness, life style and health related quality of life. Payesh. 2015;14(1):85-92. [Persian].
64. Mirowsky J, Ross CE. Education, Health, and the Default American Lifestyle. J Health Soc Behav. 2015;56(3):297-306. doi:10.1177/0022146515594814
65. Haskell WL. Cardiovascular disease prevention and lifestyle interventions: effectiveness and efficacy. J Cardiovasc Nurs. 2003;18(4):245-255. doi:10.1097/00005082-200309000-00003