

# Lifestyle of patients with coronary artery disease hospitalized in the heart department of Vali-e-Asr Hospital of Birjand and its association with some cardiovascular risk factors

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## Abstract

**Background:** Lifestyle modification plays the most important role in the prevention of cardiovascular diseases. This study aims to assess the lifestyle of patients admitted to the cardiology department of Vali-e-Asr Hospital in Birjand from August 2014 to April 2015 and determine its relationship with cardiovascular risk factors.

**Methods:** In this cross-sectional study, 400 patients hospitalized in the heart department were incorporated by census. The data were gathered using Breslow's Lifestyle Index and a researcher-made questionnaire that included demographic characteristics of patients, history of heart disease, smoking, type of oil daily consumed, the frequency of different foods taken per week, and the results of tests taken on patients. Data were analyzed by SPSS software (version 22) using t-test and ANOVA.

**Results:** The mean age of the patients was 60.7±13.4 years. The majority 203 (50.8%) were male; 190 (47.5%) had diabetes; 181 (45.2%) suffered from obesity and overweight, 25% had high systolic blood pressure; and 10.5% had high diastolic blood pressure. Also, 14.2% were smokers. The mean score of participants on Breslow's Lifestyle Index was 5.61±1.11, which was significantly higher in overweight and obese subjects than subjects with normal weight (P=0.001).

**Conclusions:** Some lifestyle indices in patients hospitalized in the heart department of Vali-e-Asr Hospital in Birjand are undesirable, and their lifestyles need to be modified.

**Keywords:** Lifestyle; Coronary Artery Disease; Risk Factors; Birjand

## 1. Introduction

Cardiovascular disease (CVD) stands as the most common causes of death in both the developing and the developed countries (1-2). In 2008, CVD was responsible for 48% of deaths caused by non-communicable diseases. By the year 2020, CVD is expected to account for three-quarters of all deaths in the developed and developing countries (3). The incidence of cardiovascular disease varies across different regions and countries. The Eastern Mediterranean region and parts of Eastern Europe have the highest incidence of CVD in the world (4).

CVD is similarly the leading cause of mortality and morbidity in Iran and account for the high costs of health

care (5). They are at the same time among the most preventable causes of death due to non-communicable diseases (3).

These diseases are associated with risk factors such as smoking, alcohol consumption, obesity, diet, and physical inactivity (5-6).

Most of the known risk factors for CVD are related to lifestyle. Factors such as increased consumption of fast foods with high saturated fats, reduced physical activity, and increased prevalence of obesity and diabetes have led to a progressively increased prevalence of cardiovascular risk factors in communities (7).

Metabolic risk factors associated with CVD include increased levels of lipids, hypertension, and obesity. High levels of cholesterol are estimated to cause 56% of ischemic heart disease and are responsible for 4.4 million annual deaths attributed to reduced physical activity and fat consumption (mainly from animal products to processed vegetable fats)(8, 9).

Worldwide, around 49% of CVD cases are attributable to undesirable blood pressure (systolic pressure above 115 mm Hg), estimated to be responsible for more than 7 million deaths per year. The increase in the average blood pressure has been associated with the industrialization of the population and the movement from rural areas to urban areas (10). In addition to pharmacotherapy, lifestyle modification as concerning diet and physical activity plays an important role in improvement of blood pressure. New guidelines recommend low-salt and low-fat diets and encourage considerable consumption of fruits and vegetables (11).

While obesity is clearly associated with an increased risk of coronary heart disease, the highest risk caused by obesity are due to other CVD risk factors including hypertension, diabetes mellitus, and lipid imbalances (12).

Studies have shown that smoking, hypertension, diabetes, high cholesterol, and central obesity in men as well as hypertension, diabetes, central obesity and high cholesterol in women have the highest share of CVD risk factors among all risk factors of CVD (13).

Considering the risk factors for CVD, lifestyle modification has the most significant role in the prevention of CVD. Although the role of lifestyle in the development of risk factors for heart disease has been studied and proved in various studies, identification of lifestyles in each region can be contributory to proper planning in order to modify wrong nutritional habits or physical activity patterns and to eliminate the existing stress given the differences in the specific beliefs and customs of each geographic region. This study aims to assess the lifestyle of patients admitted to the heart department of Vali-e-Asr Hospital in Birjand from August 2014 to April 2015.

## 2. Methods

In this cross-sectional (descriptive-analytical) study, the participants consisted of 400 patients with coronary artery disease who were admitted to the heart department of Vali-e-Asr Hospital from August 2014 to April 2015. The

inclusion criteria consisted of sufficient overall health to be able to answer questions, patient's consent for participation, diagnosis of Angina pectoris or myocardial infarction (MI), or confirmation of coronary artery disease by angiography in the patient. A total of 400 patients were recruited in the study via census. A researcher-made questionnaire was developed based on a review of the literature that was completed by interviewing the patients and incorporating the test results included in the patient records.

The questionnaire comprised of two parts. The first part covered demographic characteristics of patients, history of previous illness, smoking, type of oil consumed, and the number of different food intakes per week, and the results of the patients' tests. The second part was the Breslow's Lifestyle Index that holds 7 items on routine habits including adequate sleep, breakfast, no snack, regular physical activity, proper weight control, smoking, and alcohol consumption. Each item with a positive answer was scored 1 and those with a negative answer were scored 0. The range of scores obtained from the questionnaire ranged from 0 to 7 (14).

Content validity of the first part of the questionnaire was confirmed by experts. After a pilot administration of 30 questionnaires, the data were analyzed in SPSS software. Cronbach's alpha coefficients were calculated for different parts of the questionnaire, which were between 0.44 and 0.76.

The questionnaires were completed by interviewing the patients and the test results were extracted from the patient records.

Data were analyzed in SPSS software (version 22) using descriptive statistics (i.e., frequency, percentage, mean, and standard deviation) and inferential statistical tests (i.e., independent t-test, ANOVA, and Tukey's post hoc test). The significance level was set at  $\alpha=0.05$ .

## 3. Results

In this study, 400 patients with a mean age of  $60.7 \pm 13.4$  years participated. Minimum age was 15 and maximum age was 94 years. The majority (50.8%) was male, and the majority was married. Demographic characteristics of the participants are displayed in Table 1.

The most common risk factor was diabetes such that 190 (47.5%) of the patients suffered from diabetes. The most common type of HDL was low dyslipidemia. A total of 181 (44.2%) people were overweight or obese (Table 2).

A total of 57 (14.2%) individuals were smokers. For most of the subjects (n=262; 60.5%), the dominant oil consumed was solid oil and only 68 (17%) of them consumed liquid oil.

The average consumption of fruits and vegetables was  $3.37 \pm 1.72$  and  $2.94 \pm 1.75$  times per week, respectively. The average consumption of fish was  $0.69 \pm 0.57$  times a week.

The mean of Breslow's Lifestyle Index was  $5.61 \pm 1.11$  out of a maximum of 7 points. The distribution of factors associated with the Breslow's Lifestyle Index is shown in Table 3.

**Table 1:** Frequency distribution of demographic characteristics of patients hospitalized in the heart department of Vali-e-Asr Hospital

Variables	Number	Percentage	
Gender	Male	203	50.8
	Female	197	49.2
Education	Illiterate	233	58.2
	Primary	79	19.8
	Secondary	30	7.5
	High school	40	10
	Associate or above	18	4.5
Marital status	Single	3	0.7
	Married	397	99.3
Age group (years)	< 40	24	6
	40-50	43	10.7
	50-60	114	28.5
	60-70	122	30.5
	> 70	97	24.3

**Table 2:** Frequency distribution of risk factors in patients with cardiovascular disease hospitalized in Vali-e-Asr Hospital of Birjand in 2014

Risk factor	Number	Percentage	
Dyslipidemia	TG $\geq 150$	92	23
	Cholesterol $\geq 200$	82	20.5
	LDL $\geq 130$	139	34.8
	HDL $\leq 40$ in men and $\leq 50$ in women	232	58
High blood sugar	Between 100 to 126	108	27
	$\geq 126$	190	47.5
Overweight & obesity	BMI between 25 and 30	165	41.2
	BMI $\geq 30$	16	4
High blood pressure	Systolic $\geq 140$	100	25
	Diastolic $\geq 90$	42	10.5

**Table 3:** Frequency distribution of factors associated with Breslow's Lifestyle Index

	Number	Percentage
I do not smoke.	343	85.8
I have physical activity at least two times a week.	290	72.5
I almost always have full breakfast.	310	77.5
I do not have nuts between main meals.	375	93.8
I sleep for at least 7 hours a night.	311	77.8
I do not drink alcohol.	397	99.2
BMI <25	181	45.2

**Table 4:** Comparison of Breslow's Lifestyle indices in terms of cardiovascular risk-factors

Variable		N(%)	mean±standard deviation	P-value
<b>Blood sugar</b>	<b>Normal</b>	103 (25.8)	5.27± 1.13	0.38
	<b>Impaired</b>	107 (26.8)	5.63±1.10	
	<b>Diabetes</b>	190 (47.5)	5.54±1.11	
<b>Body mass index</b>	<b>Normal</b>	219 (54.8)	6.05±1.05	0.001
	<b>Overweight</b>	165 (41.2)	5.10±0.95	
	<b>Obese</b>	16 (4)	4.81±0.83	
<b>Triglyceride</b>	<b>Normal</b>	308	5.77±1.07	<0.001
	<b>High</b>	92	5.08±1.08	
<b>Cholesterol</b>	<b>Normal</b>	318	5.74±1.20	<0.001
	<b>High</b>	82	5.10±1.34	
<b>LDL</b>	<b>Normal</b>	261	5.61±1.13	0.91
	<b>High</b>	139	5.62±1.08	
<b>HDL</b>	<b>Normal</b>	168	5.45±1.18	0.01
	<b>Low</b>	232	5.72±1.27	
<b>Systolic blood pressure</b>	<b>Normal</b>	301	5.69±1.11	0.01
	<b>High (≥140)</b>	99	5.37±1.08	
<b>Diastolic blood pressure</b>	<b>Normal</b>	358	5.65 ±1.11	0.04
	<b>High (≥90)</b>	42	5.28±1.02	

The mean of lifestyle index was not statistically significant in terms of glucose levels ( $P=0.38$ ). Tukey's post hoc test showed that the mean of lifestyle index in subjects with normal BMI was significantly higher than those with overweight and obesity ( $P=0.001$ ), but there was no significant difference between overweight and obese subjects ( $P=0.49$ ).

The mean of lifestyle index in individuals with normal triglyceride and cholesterol was significantly greater than those with high triglyceride and cholesterol ( $P < 0.001$ ). However, there was no difference between subjects with normal and high LDL ( $P=0.91$ ).

The mean score of lifestyle index in subjects with low HDL was higher than those with normal HDL ( $P=0.01$ ); it was significantly greater in subjects with normal blood pressure than in those with high blood pressure ( $P=0.01$  for systolic;  $P=0.04$  for diastolic blood pressure) (Table 4).

#### 4. Discussion

The purpose of this study was to enquire into the lifestyle of CAD patients admitted to the heart department of Vali-e-Asr Hospital in Birjand and the associations between their lifestyle and cardiovascular risk factors.

The findings of this study showed that some cardiovascular risk factors in the subjects were not desirable. The type of oil used in most cases was solid, and only 17% of the participants consumed liquid oil. The

consumption of fruits and vegetables, fish and dairy products was also low.

Mean score of Breslow's Lifestyle Index was  $5.61 \pm 1.11$  out of a maximum of 7 points. In Moghadasi et al.'s study, Breslow's Lifestyle Index scores in adult men and women of Ilam were respectively  $3.9 \pm 0.9$  and  $3.7 \pm 0.7$  (14) which are lower than the score in the current study. Also, in Nuri et al.'s study in Shiraz, the scores for men and women were  $4.9 \pm 1.1$  and  $5.1 \pm 1.05$ , respectively (15). The reason for the varying values of the lifestyle index in different studies can be attributed to the difference in the populations studied, where healthy people participated in the studies mentioned while in our study, CVD patients were the participants. Known risk factors such as hyperlipidemia or hypertension, etc. could have acted as precautions for these individuals to improve their lifestyle.

The mean score of Breslow's Lifestyle Index in people with normal BMI was significantly higher than those with overweight and obesity; it was significantly less in patients with hypertriglyceridemia, hypercholesterolemia, and hypertension than in normal subjects. In the study of Moghadasi and colleagues in Ilam, Berslow's Lifestyle Index correlated significantly with serum triglyceride levels in men and women and with cholesterol levels in women (14), which is consistent with findings of the present study. This suggests that those who have an inappropriate lifestyle would suffer more from lipid disorders.

In a study on the prevalence of risk factors in men based on a Tehran-based study on lipid and glucose status, it was found that the prevalence of cardiovascular risk factors in people with high triglycerides and high waist circumference was higher than in other groups (16).

The most common dyslipidemia in the present study comprised of low HDL and high LDL. Maleki et al.'s study showed that the main risk factor in patients with obstructive coronary artery disease is hypercholesterolemia, which can indicate bad habits and high prevalence of inactivity (17). Dyslipidemia is one of the known risk factors for CVD, which is related to the lifestyle of individuals.

The most widely used oil in this study was solid oil. In the study of Koohpayehzadeh et al. regarding the relationship between nutritional factors and acute MI, the most common type of oil used in the two groups involved vegetable oils (18). Given the high consumption of solid oil and low consumption of liquid oil in individuals in our study, the prevalence of various types of dyslipidemia is not unexpected.

In this study, there was a low consumption of good foods such as vegetables, fruits, and dairy products, indicating an inappropriate nutritional pattern in the studied patients. The role of nutritional factors has been proved in the pathogenesis of ischemic heart disease in various studies (19). In the study of Koohpayehzadeh et al., consumption of red meat was greater in patients, whereas the consumption of fruits and dairy products was lower in the control group (18). In a study, the relationship between food habits and cardiac ischemia was investigated among patients admitted to Shahid Beheshti Hospital of Kashan, showing that the prevalence of ischemic diseases correlated significantly with the consumption of fruits, vegetables, starch and dairy products (20). It was observed in the study of Pourreza et al. that consumption of at least 7 servings of fruits and vegetables per week has a protective role (21). Differences in the nutritional pattern in different places can be influenced by various geographical, cultural, social and economic factors. Overall, however, results indicate that patients with cardiovascular disease have a poor dietary pattern.

In the present study, the mean score of Breslow's Lifestyle Index was higher in those with an abnormal HDL level. The mean score did not differ significantly between diabetic and non-diabetic individuals. This contradicts findings from other studies possibly because of the

population in the present study. The patients with a history of cardiac diseases in our study may have modified their lifestyle due to their knowledge of background chronic illnesses or known risk factors such as hypertension, diabetes, or hyperlipidemia. This has not been evaluated in this study, however, given the cross-sectional nature of the study and is one of the limitations of this study.

The strength of the present study lies with its relatively big sample size and the wide range of risk factors covered. On the other hand, the sampling method can be a limitation as only patients admitted to the heart department who were satisfied with participation were included, and the results cannot be generalized to all CVD patients in Birjand.

## 5. Conclusion

Despite the undesirable status of risk factors for CVD in patients admitted to the heart department of Vali-e-Asr Hospital in Birjand, some lifestyle indicators are desirable in these patients, which may be because of lifestyle modifications following a known risk factor. Some lifestyle factors such as overweight and obesity require more effort to encourage positive corrective behaviors in the patient's life pattern.

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## References

1. Jacob S, Ferrières J. [Epidemiology of coronary disease and prevention of cardiovascular diseases]. *Soins*. 2015;(793):32-5. [French]
2. Krishnan A, Yadav K, Kaur M, Kumar R. Epidemiology to public health intervention for preventing cardiovascular diseases: the role of translational research. *Indian J Med Res*. 2010;132:643-50.
3. Amirsadri M, Hassani A. Cost-effectiveness and cost-utility analysis of OTC use of simvastatin 10 mg for the primary prevention of myocardial infarction in Iranian men. *Daru*. 2015;23:56.
4. Talaei M, Sarrafzadegan N, Sadeghi M, Oveisgharan S, Marshall T, Thomas GN, et al. Incidence of cardiovascular diseases in an

- Iranian population: the Isfahan Cohort Study. *Arch Iran Med.* 2011;16(3):138-44.
5. Sabzmakan L, mazloomi mahmoodabad S, Morowatisharifabad, MA, Mohammadi E, Naseri MH, Mirzaieae M, et al . Patients, Experiences with Cardiovascular Disease Risk Factors and Healthcare Providers of Determinants of the Nutritional Behavior: A Qualitative Directed Content Analysis. *Iran J Endocrinol Metab.* 2013; 15 (3) :292-302. [Persian]
  6. Boutayeb A, Boutayeb S. The burden of non communicable diseases in developing countries. *Int J Equity Health.* 2005; 4(1):2.
  7. Popkin BM, Gordon-Larsen P. The nutrition transition: worldwide obesity dynamics and their determinants. *Int J Obes Relat Metab Disord.* 2004;28 Suppl 3:S2-9.
  8. Mehrkash M , Mohammadian S , Qorbani M, Eshghinia S, Shafa N. Prevalency of metabolic syndrome among adolescents aged 15 to 17 years in Gorgan, Northern Iran (2009). *J Gorgan Univ Med Sci.* 2011 13(2):93-9. [Persian]
  9. Sadeghi M, Roohafza H, Shirani S, Baghaei A, Golshadi I, Aghdak P. Relationship Between Hematological Factors and Metabolic Syndrome in an Iranian Population Isfahan Healthy Heart Program. *J Rafsanjan Univ Med Sci.* 2006; 5(2):109-16. [Persian]
  10. Bagherian Sararoudi R, Saneei H, Bahrami Ehsan H. The Relationship of History of Hypertension and Illness Cognitive Representation in Post-Myocardial Infarction. *J Isfahan Dent Sch.* 2010 27(101):701-10. [Persian]
  11. Feyh A, Bracero L, Lakhani HV, Santhanam P, Shapiro JI, Khitan Z, et al. Role of Dietary Components in Modulating Hypertension. *J Clin Exp Cardiol.* 2016;7(4):pii: 433.
  12. Mohammadifard N, Shams H, Paknahad Z, Sajadi F, Maghroon M, Safari H, et al. Relationship between obesity and cardiovascular risk factors in adults living in central Iran: Results of Isfahan Healthy Heart Program. *Iran J Nutr Sci Food Technol.* 2009; 3(4):19-28. [Persian]
  13. Azimi S, Khalili D, Hadaegh F, Mehrabi Y, Yavari P, Azizi F. Direct Estimate of Population Attributable Fraction of Risk Factors for Cardiovascular Diseases: Tehran Glucose and Lipid Study. *Iran J Epidemiol.* 2012; 7(4):9-18. [Persian]
  14. Moghadasi M, Nikbakht M, Kuchaki M. Association Between Lifestyle Status and Dyslipidemia in Ilam Adults. *Iran J Endocrinol Metab.* 2011; 13(2): 137-44. [Persian]
  15. Nuri R, Moghadasi M, Moraveji F. Association between Obesity and Overweight with Lifestyle Status and Physical Fitness Level in Shiraz Adults. *Iran J Endocrinol Metab.* 2012; 14(3):241-7. [Persian]
  16. Ghanbili M, Mirmiran P, Solati M, Majeed M, Azizi F. Incidence of cardiovascular risk factors in hypertriglycemic- waist males (Tehran Lipid and Glucose Study). *Iran J Endocrinol Metab.* 2003; 5(3):179-85. [Persian]
  17. Maleki A, Miri M, Ghanavati R, Bayat M, Montazeri M, Rashidi N, et al. The Prevalence of Risk Factors of Coronary Artery Diseases In CCU Ward. *Nursing Development in Health.* 2012 3(4-5): 7-13. [Persian]
  18. Koohpayehzadeh J, Mohammad Hassani M, Mirkhani S. Study of Correlation between Nutritional Factors and Acute Myocardial Infarction . *Razi J Med Sci.* 2006; 13(50):147-54. [Persian]
  19. Najimi A, Azadbakht L, Hassanzadeh A, Sharifirad GR. The Effect of Nutrition Education on Risk Factors of Cardiovascular Diseases in Elderly Patients with Type 2 Diabetes: a Randomized Controlled Trial. *Iran J Endocrinol Metab.* 2011; 13(3):256-63. [Persian]
  20. Taghaddosi M, Vali GR. Behavioral habits and ischemic heart disease in Kashan, 1995. *Feyz.* 2003;7(2):43-9. [Persian]
  21. Pourreza A, Barat A, Hosseini M, Akbari Sari A, Oghbaie H. Relationship between socioeconomic factors and coronary artery disease among under-45 year-old individuals in Shahid Rajaei Hospital, Tehran, Iran: A case-control study. *J Sch Public Health Inst Public Health Res.* 2010; 7(4):25-32. [Persian]