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Original Article

Investigating the distribution of risk factors of heart diseases and related factors in Urmia city in the year 2023

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Abstract

***Background & Aims*:** Due to the fact that cardiovascular diseases are one of the most important causes of death and disability worldwide, including Iran, and considering the importance of this issue, this study was conducted with the aim of investigating the distribution of heart disease risk factors and related factors in Urmia city.

***Materials & Methods*:** The study sample included 10,000 people over 30 years of age in Urmia city, who were examined in terms of the risk of cardiovascular diseases in 2023. A multi-stage cluster sampling method was used to select the samples. Descriptive statistics, frequency, and percentage were used to describe the findings, and data analysis was performed using SPSS 22 software.

***Results*:** The average age of the subjects studied was 49.19 ± 13.21 years. Furthermore, 91.2% had a risk level of less than 10%, 8.2% had a risk level between 10% and 20%, and 0.3% had a risk level between 20% and 30%, and 0.3% had a risk level above 30%. The average levels of cholesterol and FBS of risk assessed people were 177.72 ± 32.6 and 99.3 ± 32, respectively. The prevalence of people with high blood pressure was 17.2%, and diabetes was 12.2%. The average waist circumference and body mass index were calculated as 91.36 ± 10.7 and 27.8 ± 4.3, respectively.

***Conclusion*:** In this study, people who were at risk of heart diseases were reported to be less than 10%, which requires the use of up-to-date and efficient models to accelerate appropriate intervention for high-risk people.

***Keywords*:** Cardiovascular diseases, Health care centers, Patients, Risk assessment, Urmia

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Introduction

Deaths due to cardiovascular diseases account for more than 75% in low- and middle-income countries. The disability-adjusted life years index for cardiovascular diseases is 10% in low- and middle-income countries and 18% in high income countries

(1). Iran is a middle-income country in West Asia, where cardiovascular diseases are the most important cause of death (2). In Iran, non-communicable diseases (NCDs) caused 236 thousand deaths in 2013, marking a 14.5% increase in NCDs-related deaths over the past two decades (3).

The distribution of effective factors on cardiovascular diseases is different in many countries. However, factors such as age, diabetes, high blood pressure, family history, smoking, body mass index, weight gain, cholesterol, and blood sugar can affect cardiovascular diseases (4, 5). In the studies conducted, the probability of cardiovascular diseases after the age of 40 is 49% for men and 32.5% for women (6). Various studies have shown that obesity is one of the causes of cardiovascular diseases, so it can be said that with weight gain, the risk of high blood pressure increases between 2 and 6 times, and also, with each kilogram of weight gain, systolic blood pressure increases by about 1 mmHg (7).

In 2010, the World Health Organization (WHO) initiated an innovative and action-oriented response called Package of Essential Noncommunicable Disease Interventions or WHO PEN.(8) In our country, this package was called IraPEN. In the IraPEN program, for people over 30 years of age, the ten-year risk of fatal and non-fatal heart and brain strokes is determined, even when they are not sick and have no symptoms. In the examination of each person, information such as age, sex, blood pressure, tobacco and alcohol consumption, diabetes, and cholesterol levels are measured and entered into the integrated health system (SIB) by health care workers. Then, the system categorizes the people into a 10-year risk classification (9). After that, people are treated or referred to hospitals for specialized procedures based on the determined risk level (1).

The IraPEN program has a positive effect on reducing the prevalence of risk factors in the people under follow-up, and also, by using the integrated care approach of non-communicable diseases, limited resources can be directed to the side of society that is in need (10). In most of the studies that are conducted, the focus is on the diagnosis and treatment of sick people. Based on the results of other studies, primary prevention is much more effective than secondary prevention to reduce mortality (11). Therefore, this study was conducted with the aim of investigating the distribution of heart disease risk factors and related factors in health centers of Urmia city.

Materials & Methods

This descriptive cross-sectional study was conducted after approval by the ethics committee of Urmia University of Medical Sciences with code of ethics IR.UMCU.REC.1402.102 in 1402. Considering that the number of people over the age of 30 evaluated for cardiovascular diseases from April 2022 to March 2023 was 214,000, a sample of 10,000 people was selected from among them using a multi-stage cluster sampling method. Variables include (residence, sex, age, height, weight, BMI, cholesterol level, FBS, BP, waist circumference, family history of diabetes and high blood pressure, diabetes and high blood pressure, risk level years) that were entered in the Sib system by health care workers during the risk assessment of people and were extracted by the researcher's checklist. To collect the data, the health care provider, in the Sib system from the performed care report section, enters the date (from April 2022 to March 2023), registers the code 7043 (the code related to risk assessment), searches for the names of the risk-assessed people, selects each person, and opens the summary of the electronic file of each person to view and extract information.

Inclusion criteria: In this study, according to the instructions of the IraPEN program and the package of necessary interventions for non-communicable diseases of the World Health Organization, for the cost-effectiveness of the interventions and the reduction of costs, among the people in the age group of 30 to 40, cases that have one of the risk factors (family history of diabetes, early cardiovascular events in first degree relatives, kidney failure in first degree relatives, systolic blood pressure over 140 mg/dL, waist circumference over 90 cm, smoking, history of

diabetes, and diagnosed blood pressure) were qualified to enter the study.

Exclusion criteria: People who had a history of a heart attack, history of angiography, history of coronary artery transplant, history of stroke, and history of peripheral vascular disease were excluded from the study.

To describe the findings, descriptive statistics and frequency and percentage of use, and data analysis were done using SPSS 22 statistical software.

Results

The average age of the study subjects was 49.19 ± 13.21 years. Most of the participants in the study were 5,407 (54.1%) women and 4,593 (49.5%) men. The majority of participants were married, 9,098 (91%), and only 902 (9%) were single. In terms of literacy level, 2,113 (21.1%) people were illiterate, 2,673 (26.7%) had primary education, 1,777 (17.8%) had middle school education, 2,399 (24%) had high school education, and only 1,038(10/4%) had a university education (Table 1).

In the examination of the risk level of cardiovascular diseases among the studied subjects, it was found that 91.2% had a risk level of less than 10% (Table 2). The average systolic and diastolic blood pressure of the subjects were 114.17 ± 11.6 and 70.8 ± 8.6, respectively. The average cholesterol level of the risk-assessed subjects was 177.72 ± 32.6, and their fasting blood sugar average was 99.3 ± 32. The number of people with high blood pressure and diabetes was 1,724 (17.2%) and 1,222 (12.2%), respectively. Also, average waist circumference and BMI were calculated as 27.8 ± 4.3 and 91.36 ± 10.7, respectively.

Table 1. Frequency distribution and demographic characteristics of the studied subjects

Variable		Frequency	Percent
Address	City	6301	63.0
	Village	3698	37
History of alcohol consumption	Yes	261	2.6
	No	9739	97.4
Family history of kidney failure	Yes	54	0.5
	No	9946	99.5
History of diabetes	Yes	1222	12.2
	No	8778	87.8
Family history of diabetes	Yes	452	4.5
	No	9548	95.5
History of high blood pressure	Yes	1724	17.2
	No	8276	82.8
A smoker	Yes	828	8.3
	No	9172	91.7
Insurance status	Social security	3003	30
	Health	6336	63.4
	Armed forces	338	3.4
	Other	42	0.4
	Does not have	274	2.7
Job	Housewife	4115	41.2
	Employee	1037	10.4
	Free	4687	46.9
	Unemployed	161	1.6

Table 2. Frequency distribution of cardiovascular disease risk level

Risk level	Frequency	Percent
Less than 10 percent	9115	91.2%
Between 10 and 20 percent	824	8.20%
Between 20 and 30 percent	33	0.30%
Above 30 percent	28	0.30%

Discussion & Conclusion

The present study examines the results of the program of screening, prevention, and control of non-communicable diseases in 10,000 people over 30 years old in Urmia city. In total, among the risk factors of cardiovascular diseases, the prevalence of high blood pressure was 17.2% and the prevalence of diabetes was 12.2%. The results of the risk assessment in the Isfahan study also showed that the prevalence of diabetes was 11.5% and the prevalence of high blood pressure was 17.4%, which is consistent with the present study (12). Also, in Hossein Khani's study, which was conducted on the residents of Mino region in Qazvin, the prevalence of diabetes was 17.1% (13). In a review study, they reported the prevalence of high blood pressure and diabetes in the population over 40 years old as 42.2% and 18.7%, respectively (14). In Emberson's study, the average prevalence of hypertension in the Eastern Mediterranean region was 29%, which affects 125 million people, and in Iran, this rate is 43.6% (15). In Spain, 33.7% of patients had high blood pressure (16).

The results of a study showed that having diabetes and high blood pressure puts people at a higher risk level (17) In Iran, patients (diabetics and those with blood pressure issues) are sent to higher levels (The first level of a person's referral involves health workers, and if needed, they are referred to a family doctor/general practitioner located in urban/rural health centers and from there to a specialist doctor located in a special clinic/city hospital) (18), according to the referral system after being identified (10).

Among the risk-assessed people, 4.5% had a family history of diabetes, 17.2% had a family history of high blood pressure. In the analysis of the risk assessment results of the study by Jahani et al., there was a significant relationship between family history of diabetes and risk level (10). Also, family history is very effective in transferring an unhealthy lifestyle (19). Therefore, it seems necessary to use educational interventions to change people's lifestyle by health care providers.

The average level of cholesterol and FBS in our study was 177.72 ± 32.6 and 99.3 ± 32, respectively. In a study in Mashhad, the average cholesterol was 179.1, and the average blood sugar of the subjects was 94.5, which is consistent with our study (20). One of the important risk factors for cardiovascular diseases is total cholesterol. Every 1 mmol/L increase in cholesterol causes a 35% increase in the risk of death from coronary artery diseases, a 25% increase in the risk of fatal and non-fatal stroke (14). In a study conducted in 69 countries, it was reported that the mortality rate of cardiovascular diseases was higher in people with high cholesterol than in people with low cholesterol (21).

The results of our study showed that 91% of the risk assessed people had a risk level of less than 10%, 8.2% had a risk level of 10-20%, 0.3% had a risk level of 20-30%, and 0.3% had a risk level of more than 30%. The results of the study conducted in Noor and Mahmoud Abad cities of Babol also showed that most people had a risk level of less than 10% (61%) and also in the study of Hadavand Siri, % had a risk level of less than 10%, which the results of both studies are consistent with our study (10,9). The results of a study showed that in assessing the 14-year risk of cardiovascular diseases (using the SCORE tool), 53.8% of the studied women were at low risk level and this rate was 36.6% in men (17). The average BMI and waist circumference in our study were 27.8 and 91.3, respectively, and the BMI in the Isfahan study was 29.2, which is inconsistent with our study (12). In the third survey of the National Health and Nutrition Survey, it was shown that waist circumference is strongly related to the risk factors of cardiovascular diseases in women and men (22). In a research, Ledoux et al. found that body measurements are moderately correlated with high blood pressure, blood lipid disorders, and diabetes, and that BMI plays an almost equal role like waist circumference (23).

Smoking, along with high blood pressure, increases cardiovascular risk (24). In our study population, the majority of people did not smoke (8.3%), and 2.6% of people consumed alcohol. Considering that in other

studies conducted in Urmia city, the prevalence of alcohol consumption is high (15.8%) (25), it seems that the actual statistics of alcohol consumption are higher than reported. In the analysis of the risk assessment data of the Qazvin study, smoking and alcohol consumption were found to be 6% and 10%, respectively (13).

The IraPEN program in our country still has problems such as the lack of coordination between departments, the lack of compatibility of the network system with the needs of patients, the lack of an integrated information system, and the instability of financial resources (26). In the risk assessment program, the follow-up and care of the identified patients have problems, as it was shown in the Isfahan study that 26% of people with diabetes and 20% of people with high blood pressure were not taken care of even once a year. The follow-up and care of 32% of people with diabetes and 41% of people with high blood pressure in another study shows that the care of these patients is insufficient (12). Regular follow-up and care of patients are one of the important factors in achieving treatment goals and identifying complications in the early stages. Searching for obstacles to follow-up and regular visits of patients can be the subjects of further studies.

The limitation that can be mentioned in this study is that only the variables recorded in the SIB system were examined, while other factors affect the incidence of cardiovascular diseases, which were not mentioned in this study. In this study, it was determined that only less than 10% of the referring people were classified as high-risk for heart diseases. It seems that it is necessary to use updated and more efficient models in order to avoid delaying appropriate intervention for high-risk people. Conducting a risk assessment program for all people over the age of 18 can help early identification of high-risk people.

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Conflict of Interest

The authors have no conflict of interest in this study.

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Data Availability

The raw data supporting the conclusions of this article are available from the authors upon reasonable request.

Ethical Statement

This study was conducted after approval by the ethics committee of Urmia University of Medical Sciences with code of ethics IR.UMCU.REC.1402.102 in 1402.

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