

# Prevalence of Cardiovascular Risk Factors among the Nurse Population in the East of Iran

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## Abstract

**Introduction:** The present study was planned to assess the prevalence of cardiovascular risk factors among nurses.

**Methods:** This descriptive-analytical study was done on employed nurses in Birjand in 2011. At first, complete clinical examinations were done; including height, weight, waist circumference, and blood pressure in standard ways. Then, 5cc blood of each subject, after a 12 hour fasting, was taken in order to measure FBS and lipid profile. A questionnaire inquiring demographic information and history of previous cardiovascular risk factors was filled out. At the end data were analyzed by T test in SPSS software (V.15).

**Results:** The mean age of the subject was 40.6±7.2 yrs. The most prevalent risk factor were dyslipidemia, overweight, and central obesity (70.4%, 40%, and 37.7% respectively). Dyslipidemia and smoking in men, and obesity in women were more prevalent.

**Conclusion:** The prevalence of cardiovascular risk factors were high in nurses despite the adequate specialized knowledge about these risk factors.

**Keywords:** Cardiovascular Risk Factor, Nurse, Iran

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## 1. Introduction

Cardiovascular diseases (CVD) are one of the most important causes of death throughout the world [1]. These diseases are the reason for 30% of mortalities in Iran and the rest of the world [2]. During recent years, due to industrialization development of communities and citizenship, extensive changes have occurred in the life style of people having different races and culture [2, 3]. In the Middle East, these changes have revealed in the form of replacing a rich fiber, low cholesterol and fat diet, with a low fiber, rich in cholesterol and fat one. As a result, obesity and inactivity have extensively been increasing [4, 5]. Such changes have caused cardiovascular diseases [6]. Regarding the chronic nature of these diseases, they can increase mortality rate, disability, lowering life style status, imposing great expense on health systems, and social problems.

The underlying risk factors of these diseases are of various types. Among them, smoking, diet, and insufficient physical activity, as behavioral risk factors; and dyslipidemia, hypertension, obesity, and Diabetes Mellitus (DM), as metabolic risk factors, are of utmost importance [1, 7]. Various studies have shown that these factors have a relatively high prevalence in both patients with Ischemic heart diseases and across the whole community [6, 8].

However, CVD are among the most preventable chronic diseases of man; and if they are controlled their probable damages in and their imposed expense on the health system of every community will decrease [9].

Nurses are the backbone of health systems throughout the world and have a critical role in the health systems, health education, and prevention of diseases. Thus, they act as a practical model of healthy life for both patients and the community [10, 11]. These health care workers are closely faced with and aware of CV risk factors and their damages

[12]. Therefore, they are expected to do more in the domain of correcting the community's life style and its improvement through deleting CV risk factors [13, 14]. Besides, regarding the educational role of nurses towards patients and their attendants it is reasonable to expect more effective education on the part of the nurses who have a healthier life style and are more aware of their own health risk factors.

Different studies about CV risk factors in nurse population have shown that a significant number of nurses are prone to an increase in CV risk factors. Among them smoking, overweight, and lack of regular exercise are the more important ones [12, 15].

Since the health of nurses, as one of the basics of any health system, and the necessity of determining the pathologic condition in the community or specific group; and regarding that there was no specific information about the health workers in the east of Iran, the present study was designed aiming at determining CV risk factors in the nurses of Birjand educational hospitals.

## 2. Methods

The present cross-sectional study was done on the nurses of Birjand educational hospitals. The study protocol had been approved by BUMS' ethical committee. After selecting the study population and taking their written consent, they entered the study.

In order to gather necessary data a self-designed questionnaire on the basis of the aim of the study including demographic information, CV risk factors status, and results of biochemical tests of the cases was used. Content reliability of the questionnaire was confirmed by three of expert academic members. Data collection was done in the following manner: First of all, two trained nursing adepts

collected demographic data and CV risk factors through interviewing the cases. Then, the subjects were weighed by means of German Seca scale while they were bare-footed and had the least clothing on; with an error margin of 50 g. Height measurement of the cases was done using a strip meter while they were bare-footed and their heads were attached to the back wall, with an error limit of 0.5 centimeter. Waist circumference parallel to the navel and buttocks circumference regarding its most prominent spot were also measured. Blood pressure of the subjects was measured two times by means of a Mercury sphygmomanometer while they were sitting, with a lapse of 5 minutes under standard condition. All the measurements were done by the same nurse using the same equipment whose accuracy was regularly checked. Then, the obtained data was recorded in the questionnaire. For the assessment of blood factors, 5cc of blood from each one's brachial vein was extracted after a 12 hour fasting. After preparation and freezing of the samples in the hospital lab, they were simultaneously sent to Imam Reza special clinical lab to undergo FBS, CHOL, LDL, HDL and TG tests.

Diabetic criteria in the present study were  $FBS \geq 126$  mg/dl, as diabetes;  $FBS$  110mg/dl-125 mg/dl, as prediabetes; and dyslipidemia indices were Triglyceridemia  $> 150$ mg/dl, Cholesterol  $>200$ mg,  $LDL >130$ mg/dl,  $HDL <40$ mg/dl (in males) and  $HDL <50$  (in females). Besides,  $BP \geq 140/90$  was taken as "Hypertension".

The obtained data was fed into SPSS software (V:13), and after applying descriptive statistics, was analyzed using  $X^2$

and t-test at the significant level  $\alpha=0.05$ .

### 3. Results

The current study was conducted on 453 individuals of Birjand educational hospitals health staff with the mean age of  $40.6 \pm 7.2$  yrs. Among the subjects, 297 were females (65.6%) and 432 (95.4%) were married. Regarding education 192(42.4%) held a high school diploma or part of high school education, 54(11.9%) were associates, 176(38.9%) had B.S. degrees, and 31 (6.9%) had MA or PhD degrees. Among them 14 (3.1%) were current smokers. The mean BMI of the subjects was  $25.8 \pm 4.3$  kg/m<sup>2</sup>.

Figure 1 illustrates CV risk factors of the subjects. According to the figure, the most prevalent risk factors in the population under study were dyslipidemia, overweight, and central obesity; i.e. 70.4%, 40%, and 37.7% respectively. As seen, the risk factors "smoking", "diabetes", and "hypertension" had the least prevalence (3.1%, 3.1%, and 9.1% respectively). As for dyslipidemia, low HDL (44.4%) were the most and high TG (24.9%) were the least prevalent items.

Table 1 also presents a comparative assessment of CV risk factors in the two sexes. It was found that the prevalence of dyslipidemia and smoking was significantly higher in males. However, central obesity was more in females. Regarding diabetes prevalence and the factors overweight, obesity, and hypertension no significant difference was found between the two sexes.

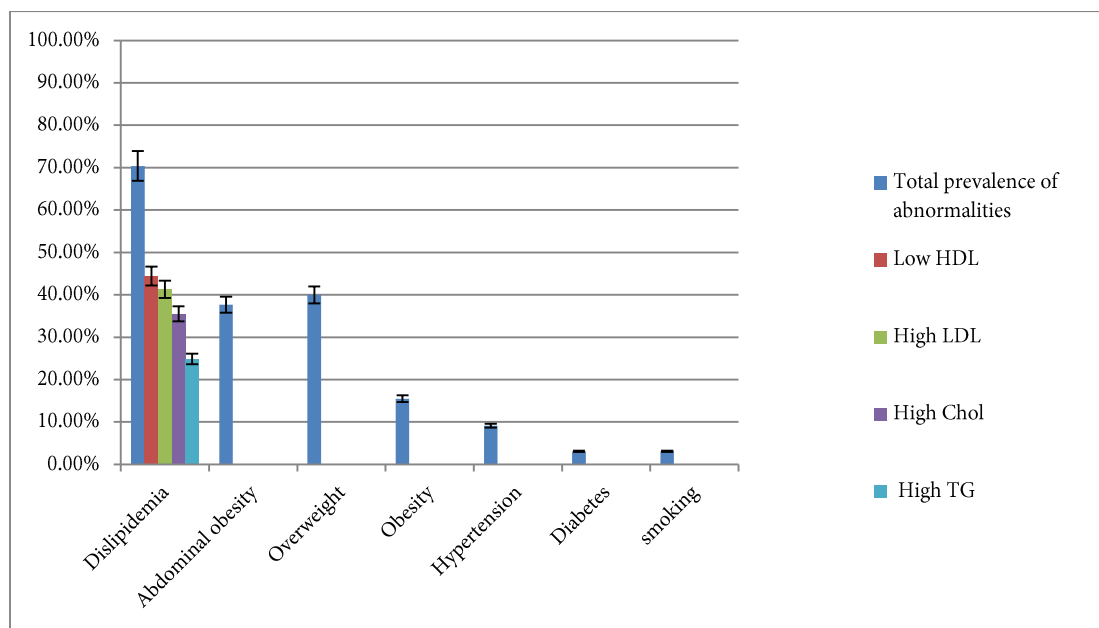


Figure 1. CV risk factors in the population under study

Table 1. Prevalence of CV risk factors with respect to sex in the study population

Prevalence Risk Factors	Total N (%)	Male N=156	Female N=297	P Value
Diabetes	14 (3.09)	8 (5.1)	6 (2)	P=0.09
Hypertension	41 (9.05)	17 (10.9)	24 (8.1)	P=0.32
Smoking	14 (3.09)	14 (9)	0 (0)	P<0.001
Dyslipidemia	319 (70.42)	145 (92.9)	174 (58.6)	P<0.001
Low HDL	201 (44.37)	138 (88.5)	63 (21.3)	P<0.001
High LDL	187 (41.28)	73 (46.8)	114 (38.4)	P=0.08
High CHOL	161 (35.54)	62 (39.7)	99 (33.3)	P=0.18
High TG	113 (24.94)	60 (38.5)	53 (17.8)	P<0.001
Abdominal obesity	171 (37.74)	41 (26.3)	130 (43.8)	P<0.001
Overweight $25 \leq BMI < 30$	181 (39.96)	58 (37.2)	123 (41.4)	P=0.38
Obesity $BMI \geq 30$	70 (15.45)	18 (11.5)	52 (17.5)	P=0.09

#### 4. Discussion

The present study was trying to assess CV risk factors in all the employed nurses in the hospitals under the affiliation of BUMS in Birjand. The results of the study showed that dyslipidemia, overweight and central obesity are respectively the most prevalent CV risk factors.

The most prevalent CV risk factor was found to be dyslipidemia (70%) and it was significantly higher in males than in females. According to Burns' study the most prevalent CV risk factor was prehypertension. Dyslipidemia (cholesterol >200mg/dl, HDL<40mg/dl), with the level of 58%, was ranked the second. No significant statistical difference was observed between dyslipidemia among the nurses and that of the community (62%) [12]. Fair's study found that the most dominant risk factor was prehypertension and dyslipidemia (15%) was the second. Both of the above factors were less prevalent in the nurses than the community [13].

In most of the developed countries hypertension and prehypertension have been diagnosed as the greatest CV factors. Compared with the above studies it is concluded that dyslipidemia prevalence in the nurse's population in Iran is higher than those in other countries. This difference can be due to different diets, amount and type of physical activity, and –perhaps- racial and ecological varieties.

The current study revealed that among different aspects of dyslipidemia low HDL (41.28%) and high LDL (35.54%) were the most prevalent.

In Burns' study on nurses in the United States it was found that most dyslipidemia was in the form of high LDL (48%) and low HDL only in 10% of the nurses under study [12]. This report shows a difference in dyslipidemia factors in the two countries, since low HDL is known as the most prevalent CV risk factor in Iran [16, 17].

Ghazanfaris' study on Kerman citizens indicated that abnormal BMI (46%) and dyslipidemia (39.8%) had the first and the second prevalence, respectively [8]. Kazemi in her study discovered that the most prevalent CV factors in referring patients with infarction were hypertension (34.8%), smoking (32.1%), and dyslipidemia (24%) in a descending order [6]. Another study in the east of Iran found that dyslipidemia, overweight and obesity, addiction to smoking, hypertension, and diabetes were the most significant CV risk factors [18]. According to a study in Isfahan obesity [19]; in Isfahan's Healthy Heart Study hypertension, dyslipidemia, and smoking [20]; in Amir Shahr in the Mazandaran province, overweight and obesity, hypertension, diabetes, and smoking were the most significant, too [21].

Comparing the results of the present study with those of the above studies reveals that the distribution of CV risk factors in nurses, the whole population, and other sub-groups in the community are different. Dyslipidemia is the most notorious complication in the nurses, although they are expected to have experienced less prevalence of this in the current study; regarding their awareness of dyslipidemia risks and their interaction with dyslipidemia patients. This is while the obtained results astonishingly showed that the prevalence of such complications in the nurse population is much higher than that of the general population of the country. This indicates more occurrences of CV risk factors in the nurses' population. Thus, it is necessary that promoting measures should be taken in order to improve CV risk factors in the nurses, who act as one of the basics of the health systems.

Based on the findings of the present study the prevalence of overweight and obesity were 39.9% and 15.4%, respectively. A study in Shiraz found that the prevalence of overweight and obesity were respectively 37.1% and 17.9%; something similar to what we found [23]. These findings are in accord with the increase of obesity prevalence in Asia and in the world [24]. It is evident that obesity and overweight are caused by dietary changes and consuming high calorie foods [25].

Various studies show that obesity and overweight prevalence is more in females [23, 26, 27] and women are severely prone to obesity [28]. Higher prevalence of overweight and obesity in women can be due to their more inactivity [29]. This was while in our study this rate was equal in men and women,

On the basis of the present study, 37.7% of the subjects had central obesity, which was more prevalent in females; but this prevalence was less than the average (53.6%) in the country [22]. However, this percent (i.e.37.7%) of central obesity was not favorable and required weight decreasing interventions [22].

We found that hypertension prevalence was 9%, while it used to be 10% in another study in Birjand [18]. In a study conducted in Isfahan it had been 7.7% [19]. Thus, the prevalence of hypertension in the health workers, who are expected to have a better control, is in agreement with the condition in other studies and of the public.

It was discovered that diabetes prevalence in the health workers was 3.9%. It was higher in males compared to females. Its prevalence degree was close to that of Mazandaran and south khorasan provinces [18, 21]. In comparison with the developed countries [30] and the mean level in Iran [22], the diabetes prevalence was lower, which can be due to less economic and social development of Birjand [30].

The total prevalence of smoking was 3.9%, while it was significantly higher in men compared to women. It had been 6.9% in Isfahan, 15.5% in Birjand, 18% in Amir Shahr [18, 19, 21]. Different studies have shown that the smoking prevalence in men has been more. It is probable that, due to notoriety of being a smoker employed clerk, some individuals' sensitivities and feasible fears, some would have avoided reporting their smoking addiction [31].

In a recent study held out by Jardim et al. the prevalence of CVD risk factors and their changes in different health care professionals over the past 20 years in Brazil (all the students of the Faculties of Medicine, Nursing, Nutrition, Dentistry, and Pharmacy) was assessed (1993-2013). They observed an increase in the prevalence of CVD risk factors in these health care professionals. This may be related to the low activity and highly sedentary activities and on the other hand the high degree of stress in these groups [32].

#### 5. Conclusion

Based on the results of the current study, CVD risk factors in the nurses "a population with formal education in health, with appropriate knowledge on CVD and their complication" are high, and educational intervening programs should be outlined to decrease such risk factors in them for a better outcome of their health services.

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### Authors' Contributions

All authors were involved in the study design and result interpretation. All authors confirmed the final draft before submission.

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The authors declare that they have no financial disclosure.

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