*Original Research Article*

# Prevalence of Risk Factors of Cardiovascular Diseases among Nursing Staffs in Western Maharashtra, India

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## ABSTRACT

**Introduction:** Worldwide, Cardiovascular disease (CVD) is recognized as the leading cause of morbidity, mortality and disability. It is predicted that by 2020, globally the CVD would be the 1st and most leading cause of mortality and morbidity over infectious diseases Objective: To study prevalence of risk factors of cardio-vascular diseases among nursing staff at Krishna hospital Karad.
**Material & Methods:** A cross sectional study was conducted in nursing staff working in tertiary health care centre located in rural area of district Satara of state Maharashtra, India in the month of February 2013. Data was collected by using structured pre-tested questionnaire that include socio-demographic and risk factors of CVD and analyzed on SPSS-18.
**Results:** Prevalence of risk factors of CVD like overweight, hypertension (HTN), diabetes (DM) and hypercholesterolemia is 16.90%, 13.52%, 10.62% and 21.73% respectively. As age increases, as level of education increases & as working experience increases the prevalence of risk factors of CVD also significantly increases. The prevalence of HTN, DM and hypercholesterolemia was significantly higher in married nurses.
**Conclusion:** Prevalence of risk factors of CVD like overweight, hypertension, diabetes and hypercholesterolemia is more among nursing staff. Increasing age, higher education & increasing working experience increases the prevalence of risk factors of CVD significantly.

*Keywords:* CVD, Nursing staff, Prevalence, Risk factors

## INTRODUCTION

Worldwide, Cardiovascular disease (CVD) is recognized as the leading cause of morbidity, mortality and disability. It is predicted that by 2020, globally the CVD would be the 1st and most leading cause of mortality and morbidity over infectious diseases. [1] According to recent data, the burden of CVD i.e. incidence, prevalence, morbidity, mortality and disability in recent years have been grown at alarming place in low and middle income countries. In 2008, a study from India reported that India alone is burdened with approximately 25% of

cardiovascular-related deaths and would serve as a home to more than 50% of the patients with heart ailments worldwide within next 15 years. [2] The seriousness of CVD in India is that, most of the CVD sufferers are to be in their productive age which may potentially gives a huge socioeconomic burden on country. In 2005, Reddy *et al*. reported that India has incurred the highest loss in productive years of life worldwide. [3]

The known existing CVD risk factors, including advanced age, obesity, tobacco use (chewing/smoking), high blood cholesterol, high blood pressure, diabetes mellitus. However, low vegetable and fruit intake and alcohol abuse are emerging risk factors in developing countries. [4,5] There are still many unknown risk factors which are directly or indirectly contributing to CVD. An association between job-related psychological characteristics like low decision-making authority, high psychological demands, psychological workload, and physical exertion and CVD has been frequently reported from globally. [6]

In health care sector, chemical exposure, radiation sources, injuries from needle sticks, and musculoskeletal disorders are well-known occupation-related health hazards among the nursing staff, [6] however recently nursing staff are at high psychological stress due to workload, duty schedule, job satisfaction and other work related factors which may increase the risk of CVD among them which is still not clear. The present study aimed to evaluate of the health status of nursing staff from tertiary health care centre to address the risk factors of CVD.

## MATERIALS AND METHODS

A cross sectional study was conducted in nursing staff working in tertiary health care centre located in rural area of district Satara of state Maharashtra, India. The proposed study was carried out in the month of February 2013. At the time of study, total 217 nursing staff was providing nursing and patient related health care services at different working areas of health care centre. All the nursing staffs were enrolled. Institutional ethical clearance as well as informed consent was obtained before data collection. Structured pre-tested questionnaire that include socio-demographic and risk factors of CVD utilized to collect data from nursing staff. All the study participants were informed regarding schedule of interview and clinical examination. All the precautions were undertaken to get accurate data from study participants. On two consecutive working days, all the study subjects from OPD, IPD, Immunization and other service departments were personally interviewed as per questionnaire and clinically examined in casualty department by principal investigator and trained intern doctors. Sodium vaccutainer tubes were used to collect blood for biochemical analysis which was collected by trained laboratory technician.

### *Cardiovascular Risk Factors:*

Cardiovascular risk factor was evaluated by examining a subject's body-mass index, calculated as the ratio of body weight (kg) to height squared ($m^2$), various blood biochemistry parameters and systolic/diastolic pressures. Personal demographic characteristics included gender, age, education, marital status, duration of job etc. According to the Dutch GP Guidelines, BMI was divided into 2 subgroups as healthy BMI (18.50 – 24.99) and overweight (>25). Use of tobacco in any form as ≥ 1 per day, physical activity as ≤ 30 min moderately intensive physical activity on ≥5 days/week, alcohol consumption as ≥ 1 peg(30 ml) per day or

180 ml on any day of week, positive family history for cardiovascular disease in first degree relative. Blood biochemistry parameters were determined for each study subject according to WHO as, fasting blood glucose criteria values ≥ 126 mg%, serum cholesterol ≥ 220mg/dl. All blood samples and all clinical tests were run in an accredited laboratory of the participating hospital. The blood pressure was measure using an auscultatory method. Blood pressure was measure using stethoscope and sphygmomanometer. The cut off value for designating abnormality were set in this study at for systolic and diastolic as ≥140/90 mmHg as a mean of at least two readings.

The data were entered simultaneously in the computer. SPSS statistical packages version 18 was used to produce descriptive analysis. Mean age (mean±S.D) of the participants was calculated & Chi-square test was used to determine the statistical association.

## RESULTS

Table 1: Personal characteristics of nurses (N= 207)

| Personal Factors | Frequency (%) |
|---|---|
| **Age(yrs):** | |
| 21-30 | 87(42.02) |
| 31-40 | 41(19.80) |
| 41-50 | 61(29.46) |
| 51-60 | 18(8.69) |
| **Sex:** | |
| Male | 38(18.35) |
| Female | 169(81.64) |
| **Education:** | |
| ANM | 5(2.41) |
| GNM | 154(74.39) |
| Graduation | 48(23.18) |
| **Marital status:** | |
| Married | 135(65.21) |
| Unmarried | 72(34.78) |
| **Job duration:** | |
| < 10 yrs | 108(52.17) |
| 10-20 yrs | 58(28.01) |
| > 20 yrs | 41(19.80) |

Out of total 217 nursing staff 207 were enrolled in the present study. Remaining 10 were either absent on the day of data collection or not willing to involve in the study so hence they were excluded.

Maximum (42.02%) nurses were in age group 21 to 30 yrs with age ranged from 21 to 60 yrs with mean age (SD) 32.87 (10.96). Maximum proportion of (81.64%) nurses were females, 74.39% did GNM nursing course, 65.21% were married and 52.17% had working experience of less than 10 years.

Prevalence of risk factors of CVD like overweight, hypertension (HTN), diabetes (DM) and hypercholesterolemia was 16.90%, 13.52%, 10.62% and 21.73% respectively. As age increases, the prevalence of risk factors of CVD also significantly increases (p< 0.05) and was seen maximum after the age of 40 years. Prevalence of HTN and hypercholesterolemia was significantly higher in males as compared to females (p< 0.05), as level of education increases, the prevalence of risk factors of CVD also increases and showing statistically significant difference (p<0.05). The prevalence of HTN, DM and hypercholesterolemia was significantly higher in married nurses as compared to unmarried nurse (p< 0.05). The prevalence of risk factors of CVD increases as working experience increases and was seen maximum after 10 years of job duration and difference was statistically significant (p< 0.05) (Table 2).

According to table number 2 & 3 the prevalence of risk factors like use of tobacco, alcohol, lack of physical exercise and family history of risk factors of CVD was 15.45%, 7.72%, 76.81% and 11.59% respectively. Use of alcohol is significantly increases as age increases and difference was significantly associated (p< 0.05). Prevalence of use of tobacco, alcohol and physical inactivity was significantly higher in males as compared to females and difference was statistically significant (p< 0.05). As level of education increases, the prevalence of risk factors of use of tobacco,

alcohol and physical inactivity also increases and showing statistically significant difference (p< 0.05). The prevalence of physical inactivity was significantly higher in married nurses as compared to unmarried nurse (p< 0.05). The prevalence of risk factors of use of alcohol and lack of physical exercise increases as working experience increases and difference was statistically significant (p< 0.05).

**Table 2: Prevalence of life style risk factors of CVD among nursing staff.**

| Personal factors | CVD Risk Factors | | | |
|---|---|---|---|---|
| | Overweight (%) | Hypertension | Diabetes | Cholesterol |
| **Age** | | | | |
| 21-30 | 5(5.74) | 4(4.59) | 0(0.00) | 7(8.04) |
| 31-40 | 11(26.82) | 5(12.19) | 4(9.75) | 11(26.82) |
| 41-50 | 14(22.95) | 13(21.31) | 13(21.31) | 19(31.14) |
| 51-60 | 5(27.77) | 6(33.33) | 5(27.77) | 8(44.44) |
| | $\chi^2$= 13.68, p=0.003 | $\chi^2$= 23.28, p=0.001 | $\chi^2$= 23.28, p=0.001 | $\chi^2$= 18.84, p=0.003 |
| **Sex** | | | | |
| Male | 9(23.68) | 13(34.21) | 6(15.78) | 14(36.84) |
| Female | 26(15.38) | 15(8.87) | 16(9.46) | 31(18.34) |
| | $\chi^2$= 1.5, p=0.21 | $\chi^2$= 17.02, p=0.001 | $\chi^2$= 1.30, p=0.25 | $\chi^2$= 6.24, p=0.01 |
| **Education:** | | | | |
| ANM | 2(40.00) | 2(40.00) | 0(0.00) | 1(20.00) |
| GNM | 19(12.33) | 15(9.74) | 7(4.54) | 27(17.53) |
| Graduation | 14(29.16) | 11(22.91) | 15(31.25) | 17(35.41) |
| | $\chi^2$= 9.32, p=0.009 | $\chi^2$= 8.50, p=0.01 | $\chi^2$= 28.08, p=0.001 | $\chi^2$= 6.88, p=0.03 |
| **Marital status:** | | | | |
| Married | 26(19.25) | 24(17.77) | 19(10.07) | 38(28.14) |
| Unmarried | 9(12.50) | 4(5.55) | 3(4.16) | 7(9.72) |
| | $\chi^2$= 1.5, p=0.21 | $\chi^2$= 5.99, p=0.01 | $\chi^2$= 4.85, p=0.02 | $\chi^2$= 9.37, p=0.002 |
| **Job duration:** | | | | |
| < 10 yrs | 9(8.33) | 1(0.92) | 00 | 6(5.55) |
| 10-20 yrs | 12(20.68) | 14(24.13) | 7(12.06) | 22(37.93) |
| > 20 yrs | 14(34.14) | 13(31.70) | 15(36.58) | 27(65.83) |
| | $\chi^2$= 14.91, p=0.006 | $\chi^2$= 31.83, p=0.001 | $\chi^2$= 42.05, p=0.001 | $\chi^2$= 60.71, p=0.001 |

**Table 3: Prevalence of behavioral risk factors of CVD.**

| Personal factors | CVD Risk Factors | | | |
|---|---|---|---|---|
| | Tobacco (%) | Alcohol | Physical Inactivity | Family History (CVD) |
| **Age** | 15(17.24) | 1(1.14) | 68(78.16) | 6(6.89) |
| 21-30 | 7(17.07) | 9(21.95) | 33(80.48) | 9(21.95) |
| 31-40 | 8(13.11) | 6(9.83) | 47(77.04) | 7(11.47) |
| 41-50 | 2(11.11) | 0(0.00) | 11(61.11) | 2(11.18) |
| 51-60 | $\chi^2$= 0.81, p=0.84 | $\chi^2$= 18.79, p=0.003 | $\chi^2$= 2.89, p=0.40 | $\chi^2$= 6.16, p=0.10 |
| **Sex** | | | | |
| Male | 23(60.62) | 13(34.21) | 23(60.52) | 6(15.78) |
| Female | 9(5.32) | 3(8.87) | 136(80.47) | 18(10.65) |
| | $\chi^2$= 72.33, p=0.001 | $\chi^2$= 45.76, p=0.001 | $\chi^2$= 6.93, p=0.008 | $\chi^2$= 0.79, p=0.37 |
| **Education:** | | | | |
| ANM | 0(0.00) | 0(0.00) | 4(80.00) | 2(40.00) |
| GNM | 13(8.44) | 7(4.54) | 128(83.11) | 16(10.38) |
| Graduation | 19(39.58) | 9(18.75) | 27(56.25) | 6(12.50) |
| | $\chi^2$= 28.09, p=0.001 | $\chi^2$= 10.78, p=0.004 | $\chi^2$= 14.85, p=0.006 | $\chi^2$= 4.19, p=0.12 |
| **Marital status** | | | | |
| Married | 21(13.54) | 11(7.09) | 128(82.58) | 19(12.25) |
| Unmarried | 11(15.27) | 5(6.94) | 31(43.05) | 5(6.94) |
| | $\chi^2$= 0.12, p=0.72 | $\chi^2$= 0.1, p=0.9 | $\chi^2$= 36.60, p=0.001 | $\chi^2$= 1.4, p=0.22 |
| **Job duration** | | | | |
| < 10 yrs | 15(13.88) | 0(0.00) | 93(86.11) | 13(12.03) |
| 10-20 yrs | 13(22.41) | 11(18.96) | 37(63.79) | 6(10.34) |
| > 20 yrs | 4(9.75) | 5(12.19) | 29(70.73) | 5(12.19) |
| | $\chi^2$= 3.37, p=0.18 | $\chi^2$= 20.46, p=0.001 | $\chi^2$= 11.64, p=0.003 | $\chi^2$= 0.12, p=0.94 |

## DISCUSSION

According to present study prevalence of risk factors of CVD like overweight, hypertension (HTN), diabetes (DM) and hypercholesterolemia is 16.90%, 13.52%, 10.62% and 21.73% respectively. As age increases, as level of education increases & as working experience increases the prevalence of risk factors of CVD also significantly increases. Prevalence of HTN and hypercholesterolemia was significantly higher in males. The prevalence of HTN, DM and hypercholesterolemia was significantly higher in married nurses.

The World Health Report 1999 estimates that in 1998, 78% of the burden of NCDs and 85% of the CV burden arose from the low and middle income countries (Table 3). The CVD burden afflicts both men and women, with CV deaths accounting for 34% of all deaths in women and 28% in men in 1998. A large body of epidemiologic studies has clearly demonstrated a link between certain risk markers and CVD. These can be classified into two categories: those that have been proven to be causal (risk factors -Tobacco consumption, Elevated LDL, Low HDL, High blood pressure, Elevated glucose, Physical inactivity, Obesity, Diet) and those that show associations with CVD but for whom a cause and effect association is yet to be proven (risk markers-Low socioeconomic status, Elevated prothrombotic factors: fibrinogen, PAI-1, Markers of infection or inflammation, Elevated homocysteine, Elevated lipoprotein(a), Psychological factors). These markers could be classified as predisposing (e.g. obesity which may work through raising blood pressure, glucose, and lipids) or direct (e.g. smoking). [7]

Fair et al [8] studied a total of 1,345 complete surveys were collected. The respondents were mostly women (96%), with mean (SD) age of 47.4 (8.7) years.

More than 95% were not cigarette smokers, more than 50% had a healthy body mass index (<25), and more than 56% achieved the recommended levels of physical activity. Nevertheless, obesity (body mass index ≥ 30) was a health risk in one-fifth of PCNA respondents. The rates of hypertension (17%) and dyslipidemia (15%). [8]

Gupta R et al [9] found in their study found that, Coronary risk factors, anthropometric variables, blood pressure, ECG, fasting blood glucose and lipids were evaluated. A total of 1123 subjects were examined. Overall coronary heart disease prevalence, diagnosed by history or ECG changes, was found in 6% males and 10% females. Risk factor prevalence showed that smoking/tobacco use was present in 36.5% males and 11.7% females. Physical inactivity, either work-related or leisure time, was seen in 28.5% males and 22.7% females Hypertension (> or =140 and/or 90 mmHg) was present in 36.4% males and 37.5% females. Obesity, body mass index > or =27 kg/m2 was present in 24% males and 30% females. The most common dyslipidemia in both males and females was low HDL-cholesterol (<40 mg/dl: males 54.9%, females 54.2%). Hypertension, obesity, truncal obesity, diabetes and dyslipidemias increased significantly with age in both males and females. [9]

## CONCLUSION

Prevalence of risk factors of CVD like overweight, hypertension, diabetes and hypercholesterolemia is more among nursing staff. Increasing age, higher education & increasing working experience increases the prevalence of risk factors of CVD significantly.

permission to conduct the survey among nursing staff.

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