Lifestyle-associated risk for cardiovascular diseases among doctors and nurses working in a medical college hospital in Tamil Nadu, India

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ABSTRACT

Context: Globally, about 17 million people die of cardiovascular diseases (CVDs) every year and a substantial number of these deaths are attributed to four major risk factors namely unhealthy diet, physical inactivity, tobacco consumption, and alcohol consumption. Doctors and nurses often have a sedentary lifestyle. **Aims:** This study aimed at assessing the lifestyle-associated risk for CVDs among doctors and nurses in a medical college hospital. **Setting and Design:** Cross-sectional study among 250 doctors and nurses, selected using a stratified random sampling, working at a medical college hospital in Tamil Nadu. **Subjects and Methods:** After consenting, each participant answered a questionnaire comprising questions pertaining to the sociodemographic characteristics as well as lifestyle-related risk factors. Risk was categorized into low, moderate, and high based on general risk factors, physical activity risk factors, and dietary risk factors separately. **Statistical Analysis:** Descriptive statistics and Chi-square analysis were used to analyze the data. **Results:** It was found that 31.2% of all study subjects and 49.2% of doctors were at high general risk for CVDs; 30.4% of all study subjects and 42.1% of doctors were at high physical activity-related risk for CVDs; 14.4% of all study subjects and 19.8% of all doctors were at high dietary pattern-related risk for CVDs. Advancing age is a statistically significant risk factor across all risk groups. **Conclusions:** Doctors are at a higher risk for CVDs as compared to nurses as well as the general population.

Keywords: Cardiovascular diseases, doctors, lifestyle-associated risk, nurses

Introduction

Globally, an estimated 17.5 million people died of cardiovascular diseases (CVDs) in the year 2012, and a substantial number of these deaths are attributed to four major risk factors namely unhealthy diet, physical inactivity, tobacco consumption, and alcohol consumption.[1] Tobacco smoking increases the risk of coronary heart disease by 2–4 times.[2] Nicotine, the addictive component of tobacco, accelerates the heart rate, and raises blood pressure.[3]

Risk of CVDs is increased by eating more salt, more saturated and trans-fats and insufficient amounts of polyunsaturated fats, fruits and vegetables.[4] Annually, globally, approximately, 3.2 million people die due to consequences of insufficient physical activity.[5] In a study conducted in India, 79% men and 83% women were found to be physically inactive, 51% of men and 48% of women consumed high-fat diet, whereas 60% of men and 57% of women consumed very low quantities of fruits and vegetables and 12% of men and 0.5% of women smoked tobacco.[6]

Doctors and nurses form a very important segment of the population. They provide health care to the population and

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hence it is expected that they take adequate care of themselves. However, doctors and nurses often have a sedentary lifestyle and on many occasions fail to follow preventive health guidelines for their own health and hence may be at risk for CVDs. A 20-year follow-up study conducted among different healthcare professionals in Brazil reported that doctors and nurses showed excessive weight gain and there was a significant increase in the prevalence of systemic arterial hypertension in these groups.[7] The same study also reported an increased prevalence of dyslipidemia among doctors and excessive alcohol consumption among nurses. Another study carried out in Singapore to estimate the prevalence of modifiable cardiovascular risk factors among health workers (doctors and nurses) and nonhealth workers reported that around 10% of the doctors and nurses were having dyslipidemia, and around 7% of them were obese (body mass index >30 kg/m²).[8]

It has also been reported that there is a strong and consistent relationship between physician's health choices and the recommendations they make to their patients.[9] The WHO recommended doctor-population ratio is 1:1000 and in India it currently stands at 0.702/1000.[10] Furthermore, the WHO recommended nurse-population ratio is 2.2:1000 while the current nurse-population ratio in India is 1.05/1000.[11] This puts a lot more stress and burden on the health of the doctors and nurses. However, despite our search in different search engines such as PubMed, IndMED, Scopus, and Google Scholar, we could not identify studies done to assess the lifestyle-associated risk factor levels among doctors and nurses working in India. Thus, this study was designed and carried out with an objective of assessing the lifestyle-associated risk for CVDs among doctors and nurses in a medical college hospital.

Subjects and Methods

This was a cross-sectional study conducted with a sample size of 227 (rounded off to 250) estimated using a prevalence of 49.5% of physical inactivity among health care providers and an absolute precision of 6.5%,[12] in a tertiary care medical college hospital. The selection of study subjects was done using a stratified random sampling technique. The sampling frame was created by making a list of all doctors and nurses, in the age group of 18–65 years, working in the medical college hospital for at least the past 1 year. There were 252 doctors (50.4%) and 248 nursing staff (49.6%) that fulfilled the inclusion criteria. Hence, a total of 126 doctors from the list of 252 doctors and 124 nurses from the list of 248 nurses were randomly selected.

Data were collected between June and August 2013. Visiting consultants and doctors and nurses who joined within 1 year of the start of data collection and those of over 65 years of age were excluded from the study.

Each study subject was approached, and a written informed consent was obtained for the study. A questionnaire was developed specifically for the purpose of this study, comprising questions pertaining to the sociodemographic characteristics of the study population as well as lifestyle-related risk factors including unhealthy dietary practices, physical inactivity, tobacco use, and alcohol consumption. Scoring of the risk factors was done using the scoring system described by Deb and Dasgupta.[13] Accordingly, all identified risk factors were grouped into three broad groups, namely, general risk group, physical activity risk group, and dietary risk group and all three groups were scored separately. For the final risk analysis, in the present study, the risk scores in each of the three groups were categorized based on tertiles into low risk (lowest tertile), moderate risk (middle tertile), and high risk (highest tertile). Confidentiality was maintained at each phase of the study. The Institutional Ethical Review Board approved the study. Data were entered on and analyzed using Microsoft Excel spreadsheet. Descriptive statistics and Chi-square analysis were used to analyze the data. The risk was measured as a categorical variable. Multiple logistic regression analysis was carried out with risk category as the dependent variable, and the sociodemographic variables namely age, gender, and occupation type as independent variables to estimate adjusted odds ratios. A $P < 0.05$ was considered to be statistically significant for all analyses.

Results

Of the 250 study participants, 126 were doctors (50.4%) and 124 were nurses (49.6%). Mean age of the study population was 35.132 ($\pm$11.59) years. The mean age of the doctors was 40.84 ($\pm$11.767) while the mean age of the nurses was 29.30 ($\pm$8.223) and this difference was statistically significant ($t = 8.9749$; df = 248; $P < 0.0001$). Over two-thirds of the study subjects were females (68.4%) while 31.6% were males. More than two-fifths of the study population had completed postgraduation (42.4%), followed by diploma (24.8%), graduation (24.8%), and doctorate (8%). Almost half the study population comprised staff nurses (44.4%), followed by professors (17.2%), consultants (16%), tutors (14.8%), assistant professors (10.4%), associate professors (6.4%), and nursing supervisors (5.2%).

The maximum attainable score in the general risk category was 14; a score of ≤2 was considered low risk, a score of 3 was a moderate risk, and a score of ≥4 was high risk. We found that 31.2% of the subjects were at high risk, 14.8% were at moderate risk, and 54% were in low risk [Table 1]. The mean general risk factor score was 2.88 ($\pm$2.14). Advancing age, male gender and being a doctor were associated with higher risk and the associations were statistically significant [Table 1]. On doing the multivariate logistic regression analysis with general risk as the dependent variable and age, gender, and occupation type as independent variables, it was found that age group and occupation type were statistically significantly associated with having high general risk for CVDs ($P < 0.0001$ and $P = 0.003$, respectively) while gender did not influence this outcome ($P = 0.232$).

The maximum attainable score for physical activity risk was 12; a score of ≤7 was considered low risk, a score of 8 was a moderate

risk, and a score of ≥9 was high risk. We found that 30.4% of the study subjects were at high risk, 24.8% were at moderate risk, and 44.8% were at low risk for CVDs [Table 2]. The mean physical activity risk score was 7.73 (±1.51). Advancing age, female gender and being a doctor were associated with higher risk and the associations were statistically significant [Table 2]. The multivariate logistic regression analysis with physical activity risk as the dependent variable and age, gender, and occupation type as independent variables revealed that all the three covariates were associated with having a high physical activity risk for CVDs ($P = 0.01$, $P = 0.015$, $P = 0.006$, respectively).

The maximum attainable score for dietary risk was 4. A score of ≤1 was considered low risk, a score of 2 was moderate risk, and a score of ≥3 was high risk. Only 14.4% of the study subjects were at high risk while 40.4% were at moderate risk and 45.2% were at low risk for CVDs [Table 3]. The mean

dietary risk factor score was 1.62 (±0.92). Again, advancing age, male gender, and being a doctor was associated with higher risk and the associations were statistically significant [Table 2]. The multivariate logistic regression analysis with dietary risk as the dependent variable and age, gender, and occupation type as independent variables, showed that age group and gender were statistically significantly associated with dietary risk for CVDs ($P = 0.012$, $P = 0.036$, respectively) whereas occupation type was not statistically significant.

Discussion

This study was conducted among 250 doctors and nurses working in a medical college hospital in Tamil Nadu, India. The mean age of the doctors was significantly higher than that of the nurses. Because of the longer duration of studies (under-graduation and postgraduation) to become a faculty in a medical college, than nursing studies, the age at which doctors join a medical college is higher than nurses.

We found that 31.2% of the subjects were at high general risk for CVDs, 14.8% were at moderate risk, and 54% were at low risk. Gopal *et al.* in their study among health care providers also reported that 33.3% were at high risk.[14] Advancing age was statistically significantly associated with higher risk of developing CVDs. It is a well-known fact that the risk for CVDs increases as the age advances. Srivastava and Mohanty in their study reported that the distribution of CVD-related deaths below the age of 25 years was <1% and it was highest in the age group of 25–69 which was 53%.[15] There was a significant difference in the age of doctors and nurses, i.e., doctors were significantly older than the nurses. The difference in the proportion of the population in different risk categories between nurses and doctors can be attributed to this difference in the age structure.

Deb and Dasgupta[13] in their study, among adults attending out-patient department, reported a much higher proportion of population at high risk (59%) as compared to the present study and this could be because of the higher age of their population, and because of the fact that it was a hospital based study; and they too reported a statistically significant association between advancing age and high risk. Based on physical inactivity, we found that 30.4% of the study subjects were at high risk and that females were at higher risk as compared to males. Gopal *et al.* reported that 25.3% were at high risk based on physical inactivity[14] and that females had higher physical inactivity risk but it was not statistically significant. Deb and Dasgupta in their study also showed similar significant association between female gender and physical inactivity risk.[13]

Based on the dietary assessment, 14.4% of the study subjects were at high risk, in the present study. Advancing age, male gender and being a doctor was associated with significantly higher dietary risk. Deb and Dasgupta[13] reported that a significantly higher proportion of younger population were at high dietary risk as compared to the elderly; also, though not statistically

Table 1: Distribution of the study population by general risk categories and age, gender, and occupation

| Risk groups | Risk categories (%) | | | Total, n=250 (100.0%) | Statistical significance |
	Low risk	Moderate risk	High risk		
Total	135 (54.0)	37 (14.8)	78 (31.2)		
Age groups (in years)					
21-30	90 (74.4)	18 (14.9)	13 (10.7)	121 (48.4)	χ^2=90.476; P=0.000
31-40	29 (50.0)	13 (22.4)	16 (27.6)	58 (23.2)	
41-50	14 (41.2)	4 (11.8)	16 (47.1)	34 (13.6)	
>50	2 (5.4)	2 (5.4)	33 (89.2)	37 (14.8)	
Gender					
Male	31 (39.2)	9 (11.4)	39 (49.4)	79 (31.6)	χ^2=17.783; P=0.000
Female	104 (60.8)	28 (16.4)	39 (22.8)	171 (68.4)	
Occupation					
Doctors	43 (34.1)	21 (16.7)	62 (49.2)	126 (50.4)	χ^2=45.576; P=0.000
Nurses	92 (74.2)	16 (12.9)	16 (12.9)	124 (49.6)	

Table 2: Distribution of the study population by physical activity-related risk categories and age, gender, and occupation

| Risk groups | Risk categories (%) | | | Total, n=250 (100.0%) | Statistical significance |
	Low risk	Moderate risk	High risk		
Total	112 (44.8)	62 (24.8)	76 (30.4)		
Age groups (in years)					
21-30	65 (53.7)	38 (31.4)	18 (14.9)	121 (48.4)	χ^2=40.947; P=0.000
31-40	23 (39.7)	12 (20.7)	23 (39.7)	58 (23.2)	
41-50	17 (50.0)	7 (20.6)	10 (29.4)	34 (13.6)	
>50	7 (18.9)	5 (13.5)	25 (67.6)	37 (14.8)	
Sex					
Male	44 (55.7)	10 (12.7)	25 (31.6)	79 (31.6)	χ^2=9.985; P=0.007
Female	68 (39.8)	52 (30.4)	51 (29.8)	171 (68.4)	
Occupation					
Doctors	56 (44.4)	17 (13.5)	53 (42.1)	126 (50.4)	χ^2=24.473; P=0.000
Nurses	56 (45.2)	45 (36.3)	23 (18.5)	124 (49.6)	

Table 3: Distribution of the study population by dietary risk-related categories and age, gender, and occupation

Risk groups	Risk categories (%)			Total, n=250 (100.0%)	Statistical significance
	Low risk	Moderate risk	High risk		
Total	113 (45.2)	101 (40.4)	36 (14.4)		
Age groups (in years)					
21-30	60 (49.6)	57 (47.1)	4 (3.3)	121 (48.4)	χ^2=33.790;
31-40	25 (43.1)	19 (32.8)	14 (24.1)	58 (23.2)	P=0.000
41-50	15 (44.1)	15 (44.1)	4 (11.8)	34 (13.6)	
>50	13 (35.1)	10 (27.0)	14 (37.8)	37 (14.8)	
Sex					
Male	27 (34.2)	36 (45.6)	16 (20.3)	79 (31.6)	χ^2=6.617;
Female	86 (50.3)	65 (38.0)	20 (11.7)	171 (68.4)	P=0.037
Occupation					
Doctors	56 (44.4)	45 (35.7)	25 (19.8)	126 (50.4)	χ^2=6.636;
Nurses	57 (46.0)	56 (45.2)	11 (8.9)	124 (49.6)	P=0.036

significant, Deb and Dasgupta too reported that males were at higher dietary risk.

There are a few strengths and limitations of this study that we have listed. First, this study was done among doctors and nurses using a standard method of risk assessment. Second, the sample size was 250 which is a fairly large sample size. However, we did not use age as a variable for stratification of the sample and hence, age would be a confounding variable in the findings. This is a study done in a single medical college hospital and hence is not a true representative sample of all medical colleges in India. Larger Medical College Hospitals in terms of patient load and complexity and deficiency in health human resource would have much higher risk levels.

Conclusions

CVD burden is high globally as well as in India. The prevalence of risk factors for CVDs is also high. In this study, 31.2% of all study subjects were at high general risk for CVDs, 30.4% of all study subjects were at high physical activity-related risk for CVDs while 14.4% of all study subjects were at high dietary pattern-related risk for CVDs. Advancing age is a statistically significant risk factor across all risk groups. Overall, doctors are at a much higher risk as compared to nurses.

Recommendations

Even though, doctors and nurses are aware of the benefits of healthy lifestyles such as being physically active, having a healthy diet, avoiding tobacco, controlling blood pressures and so on, the overall risk for CVDs is high among doctors, indicating a gap in the knowledge and action. Interventions must be directed towards this extremely important segment of the society to curb the risk of CVDs. Since, there is a strong and consistent relationship between physician's health choices and the recommendations they make to their patients, these interventions directed at the doctors and nurses would help in reducing the risk of CVDs in

the general population in the long run. Hospitals and healthcare organizations should come up with programs specifically targeted at doctors and nurses and CVD risk factor screening should be done on a regular basis to improve the health of these groups.

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Conflicts of interest

There are no conflicts of interest.

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