

A CROSS SECTIONAL STUDY ON RISK FACTORS OF CARDIOVASCULAR DISEASES AMONG SOFTWARE PROFESSIONALS OF HYDERABAD

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Abstract

Background: With the rapid growth of technology across the world, India has become one of the leading countries in providing Information Technology (IT) services. The risk factors of Cardiovascular diseases are rising among the software professionals due to sedentary life style and work related stress.

Objectives: To estimate the prevalence of selected modifiable risk factors of cardiovascular diseases among software professionals and to determine the association between Hypertension and various risk factors

Methods: This institutional-based cross-sectional study was conducted in IT professionals. There are more than 200 software companies in and around Hyderabad. Among them four software companies were selected by lottery method from each direction. The sample size calculated was 385 and it is rounded off to 400. Data was analyzed using Epi-Info version 7. Ethical clearance was obtained from Institutional Ethical Committee (M150722022), informed written consent was taken prior to start of the study.

Results: The overall prevalence of Hypertension, overweight and obesity, alcohol consumption, smoking, physical inactivity and stress was 26%, 39%, 43.2%, 37.8%, 67% and 46.2% respectively. Association between hypertension and other risk factors found that overweight, physical inactivity, smoking, alcoholism, stress, working experience, male gender and age had a significant association with hypertension ($p < 0.05$).

Conclusion: In the present study, significant risk behaviours were observed among the software professionals, hence a healthy lifestyle must be adopted to combat these risk factors.

Keywords: Software companies, Hypertension, Obesity, Physical inactivity, Stress

Introduction

Indian software industry has built up valuable brand equity for itself in the global market. The software firms quickly moved up the value chain, from performing low cost programming abroad to providing comprehensive software development services from India for overseas

clients an abundant pool of Indian technical manpower, created a series of elite technical and management institution that responded to serve global shortage of technical manpower.^[1]

Cardiovascular diseases (CVDs) are the leading cause of death globally, taking an estimated 17.9 million lives each year. The most important behavioural risk factors of heart disease and stroke are unhealthy diet, physical inactivity, tobacco use and harmful use of alcohol. The effects of behavioural risk factors may show up in individuals as raised blood pressure, raised blood glucose, raised blood lipids, and overweight and obesity. These “intermediate risks factors” can be measured in primary care facilities and indicate an increased risk of heart attack, stroke, heart failure and other complications.^[2]

It is known that workers in the Information Technology (IT) and Information Technology Enabled Services (ITES) sectors work for long hours in sitting posture under extreme stress due to time bound targets and are vulnerable to various cardiovascular disease risk factors.. Prolonged hours of sitting leads to increased risk of death from cardiovascular disease.^[3]

Limited Information is available regarding the prevalence of risk factors of cardiovascular diseases among software professionals. In view of the above reasons it was decided to conduct this study among software professionals to determine the prevalence of risk factors of cardiovascular disease.

Objectives

1. To estimate the prevalence of risk factors of cardiovascular Diseases among software professionals
2. To determine the association between Hypertension and various risk factors

Materials and Methods

Study design and setting: This institutional-based cross-sectional study was conducted in IT professionals working in a software company, Hyderabad, Telangana, India for a period of 20 Months from March 2016 to October 2017. There are more than 200 software companies in and around Hyderabad. Among them four software companies were selected by lottery system from each direction.

Sample size and Sample design: The sample size was calculated by using the formula $Z=3.84PQ/L^2$, with the prevalence of major CVD risk factor i.e Hypertension 31% as reported in a study conducted among software professionals in India,^[4] 15% of prevalence was taken as allowable error(L). . The sample size calculated was 385 and it is rounded off to 400. The selection of study subjects from each company was done by using simple random sampling technique till the sample size is reached.

Inclusion criteria: IT professionals who were willing to participate and available during the time of data collection were included in the study.

Exclusion criteria: IT professionals who were on long leave during the data collection period were excluded from the study.

Study questionnaire: The questionnaire contains three parts.

- In first part, questions pertaining to socio demographic data
- In second part on selected risk factors
- In third part, measurements such as blood pressure, height, weight were considered.

Data collection Procedure: Approval for conducting the study was obtained from the institutional ethical committee. Permission was taken from HR department of each software company prior to start of the study. Subjects were explained the purpose and objectives of the study. Data collection was done during the individual employee's break time in the working hours by face to face interview. Participation in the study was voluntary. Blood Pressure, Height and Weight measurements were taken within the company. Participants were ensured the confidentiality of the study.

Study tools:

1. Questionnaire
2. Calibrated Sphygmomanometer
3. Measuring tape
4. Weighing machine.

A pre designed pre tested questionnaire was used in the study which was prepared with the help of the faculty members and necessary changes made after the pilot study.

Statistical analysis: Data was entered using Microsoft Excel 2010 version and analyzed using Epi-Info version 7. Data was summarized in percentages and proportions. Mean was used to assess numerical data. Chi square test was used to determine any association between variables with significance level at 5% ($p < 0.05$ considered to be statistically significant).

Results:

Out of 400 software professionals who were involved in the study, majority of them (46.3%) were in the age group of 26-30years with mean age being 30.18 ± 4.4 years. Males accounted for 59.5% of the study population and almost two thirds (64.7%) were married. Majority (87.7%) of them belong to Hindu religion. Working experience of employees < 8 years was 83.25% [Table 1].

During the measurement of blood pressure levels, according to JNC 7 classification, 45.75% were found to be normal, 28.25% (pre-hypertension) were at the risk of developing hypertension, 17.25% were newly diagnosed and 8.75% were known hypertensive [Table 2]. Body mass index (BMI) which is a measure of body fat showed that 38% were pre obese, 1% obese, 2.2% underweight. Majority (58.8%) had normal range of BMI [Table 3].

Among the cardiovascular disease risk factor, the prevalence of Hypertension, obesity, alcohol, smoking, physical inactivity and stress was 26%, 39%, 43.2%, 37.8%, 67% and 46.2% respectively [Table 4].

On looking at the association between Hypertension and Non-modifiable risk factors, it was noted that Age and Gender was statistically significant with the p-value < 0.0000001 and 0.01 respectively [Table 5].

Based on the observation at the association between modifiable risk factors and hypertension, all the modifiable risk factors i.e. overweight, physical inactivity, smoking, Alcoholism and stress are statistically significant with the p value 0.00004, 0.04, 0.00008, < 0.0000001 and 0.04 respectively [Table 6].

Table 1: Frequency distribution of study subjects by Socio-Demographic data

Age	Frequency
<25	45(11.2%)
26-30	185(46.3%)

31-35	121(30.2%)
36-40	38(9.6%)
>40	11(2.7%)
Religion	
Hindu	351(87.7%)
Christian	29(7.3%)
Muslim	20(5%)
Gender	
Male	238(59.5%)
Female	162(40.5%)
Marital Status	
Married	259(64.7%)
Unmarried	141(35.3%)
Working Experience	
>8year	67(16.75%)
<8year	333(83.25%)

Table 2: Frequency and Percentage distribution of Blood Pressure

Blood Pressure	Frequencies	Percentage (%)
Normal	183	45.75
Pre-hypertensive	113	28.25
Newly diagnosed	69	17.25
Known hypertensive	35	8.75

Table 3: Frequency distribution of Body Mass Index

Grading	Number	Percentage
Underweight	9	2.2
Normal	235	58.8
Pre obese	152	38
Obese	4	1
Total	400	100

Table 4: Prevalence of Cardiovascular disease risk factors

Cardiovascular disease risk factors	Prevalence
Hypertension	104 (26%)
Overweight & obesity	156 (39%)
Alcohol	173 (43.2%)
Smoking	151 (37.8%)
Physical inactivity	268 (67%)
Stress	185 (46.2%)

Table 5: Association between Hypertension and Non modifiable risk factors

Non modifiable Risk factors	Hypertensive	Normotensive	Chi square value	p value	Inference
Age >30years	73(43%)	97(57%)	44.1	<0.0000001	Highly significant

	<30years	31(13%)	199(87%)			
Gender	Male	72(30%)	166(70%)	5.522	0.01	Significant
	Female	32(20%)	130(80%)			
Family history	Present	57(27%)	151(73%)	0.443	0.5	Not significant
	Absent	47(25%)	145(75%)			

Table 6: Association between Hypertension and Modifiable risk factors

Modifiable factors	Risk	Hypertensive	Normotensive	Chi square value	p value	Inference
Overweight	Present	58(37%)	98(63%)	16.61	0.00004	Highly significant
	Absent	46(19%)	198(81%)			
Physical inactivity	Present	78(30%)	190(70%)	4.068	0.04	Significant
	Absent	26(20%)	106(80%)			
Smoking	Present	56(37%)	95(63%)	15.49	0.00008	Highly significant
	Absent	48(19%)	201(81%)			
Alcoholism	Present	70(40%)	103(60%)	33.14	<0.0000001	Highly significant
	Absent	34(15%)	193(85%)			
Stress	High	57(31%)	128(69%)	4.14	0.04	Significant
	Mild	47(22%)	168(78%)			

Discussion:

In the present study, the mean age of the respondents was 30.18±4.4 years with majority belonged to 26-30 years age group. Males accounted for 59.5% of the study population and almost two thirds (64.7%) were married. Majority (87.7%) belonged to Hindu religion and all of them were professionals by qualification. The mean working experience was 4.78±3.56 years

Study by Saleem M et al found that the overall mean age was 27.62 ± 3.28 years ranging from 22 to 54 years. The study population had 57.6% (288/500) of males and 42.4% (212/500) of females.^[5]

Another study by T.Thirumaleswari on employees of software industries in Chennai found that. 60% of respondents were married and 40% were unmarried.^[6]

Slightly higher age group pattern was observed by S. Divakar & C. Nirmala where 63% of the software professionals belonged to 30-35 years age group, while the remaining (37%) belonged to 35-40 years age group. Majority (57%) belonged to Hindu Religion and 70% were married population. 70% had 5-10 years of work experience and most of them worked between 8-10 hours.^[7]

It was observed in the present study that the prevalence of pre-hypertension was 28.25% and hypertension was 26%, in which 17.25% were newly diagnosed cases of hypertension and 8.75% were known cases of hypertension.

In comparison to the present study, higher prevalence of pre hypertension and hypertension was observed in study by G.R.Babu et al. ^[4] The prevalence of pre hypertension was 45.7%. By considering binary classification, the prevalence of hypertension was 31%. The reason for this difference regarding hypertension in two studies might be due to different study areas.

Padma et al on health problems in Information Technology and Business Process Outsourcing employees from Chennai observed that 22% had newly diagnosed hypertension.^[8]

Based on the BMI parameters more than one thirds (38%) were pre obese who was potential candidates for obesity in the future if no timely intervention done at the earliest and 1% was obese.

Similar kind of study by M.Seema on prevalence of lifestyle diseases among the professionals of a corporate sector found that the mean BMI at the beginning of the study was 26.06±1.79 indicating that majority were in the pre obese category. ^[9] This finding was in concurrence to the present study

In the present study, majority of them (43.2%) had the habit of alcohol consumption. Similar findings were observed in study by Darshan MS et al where 39.5% of the study sample reported that they consume alcohol. ^[10]

Out of the total study population in the present study, 37.8% (n=151) had habit of smoking. These findings were in concurrence with Su-Ying Tsai study where the percentage of current smokers was 31.4%. ^[11]

In the present study, only about one third of the subjects had regular physical exercises and majority two thirds had a sedentary life style.

Similar results were also observed by AbhayMudey, M. Prasad where most of them lead a sedentary lifestyle (70 %). ^[12]

With regards to stress, present study found that all of the study participants reported some sort of stress. Majority (53.8%) had mild stress, 46.2% reported high stress.

Darshan MS et al had similar findings where 51.2% of the study sample was found to be professionally stressed at the time of the interview. ^[10]

Present study shows that there is significant association between hypertension and age, gender. Similar results were observed in a study done by Tanuja R Bramankar et al ^[13] where family history also shows significant association with hypertension but in the Present study this association was insignificant.

In this study, significant association was found between hypertension and overweight/obesity, physical inactivity, alcohol. Similar results were seen in a study conducted by S Ganesh kumar et al. ^[14]

Based on the observation, there was significant association between hypertension and smoking, stress. Similar results were found in a study done by Tanuja R Bramankar et al. ^[13]

Strengths of the study

- The assessment of risk factors of cardiovascular diseases among the study participants increased the awareness and helped them to adopt healthy lifestyle, thereby preventing the diseases occurrence and its complications.
- There is no risk involved to the individual during the course of the study.

Limitations of the study

- Investigations like lipid profile and blood glucose estimation were not done in this study due to technical and financial constraints. Hence variable Hypertension only taken to measure association in the study.

- Inclusion of only day shift workers. Night shift workers were not taken due to inadequate feasibility and accessibility.
- Since the study was carried out in 4 randomly selected software companies, findings cannot be generalized to the entire group of software professionals
- Since limited information is available regarding risk factors of CVD in software professionals, reference articles (table 6) were taken from bank employees to quote the association between risk factors.

Conclusion:

- Major risk factors of cardiovascular diseases like Hypertension, Overweight/obesity, physical inactivity, Alcohol use, smoking, Stress were observed among software professionals in the study. Hypertension was significantly associated with age, gender and other risk factors of cardiovascular diseases.
- Screening health camps need to be conducted to assess the cardiac fitness of employees once or twice a year and necessary intervention can be done.

Recommendations:

- Significant risk behaviours were observed among the study population hence a healthy lifestyle must be adopted to combat these risk factors and future diseases with a proper balanced diet, physical activity and by giving due respect to biological clock.
- The risks of a sedentary lifestyle can be reduced by increasing the amount of physical activity that they do like setting reminders to stand up every 60 minutes when working at a desk, taking a walk or standing up during coffee or tea breaks, taking the stairs instead of using the elevator, indulging in good exercise programme after the working hours.
- The consumption pattern giving priority to fast food culture has to be effectively controlled.
- Stress management techniques yoga, meditation and other distressing activities like aerobics, dance etc., would prevent or reduce risk of disease due to stress in IT people which in turn will produce a healthy community. Hence these should be included as integral part before the commencement of the duties at the work place.

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