A Survey to Predict Risk Factors for Coronary Artery Disease Using ACSM Risk Factor Categories Amongst Officer Grade Bank Employees

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ABSTRACT

The present study aims to find out the prevalence of coronary artery disease (CAD) risk factors based on the American College of Sports Medicine (ACSM) risk factor guidelines among officer-grade bank employees. A cross-sectional survey with a sample size representing the target population was conducted. The study employed a structured questionnaire, ascertaining the risk factors of family history, lifestyle, and physiological parameters. The ACSM risk factors are significantly correlated with the incidences of CAD and are good indicators to predict the likelihood of suffering from CAD. It further illuminates that cardiovascular health for the banking sector, especially for the identified risks, would need specially targeted intervention programs.
Despite numerous researches carried out on the risk factors of coronary artery disease (CAD) in the general population, some specific occupational groups have unique influences that affect their cardiovascular health. Officer-grade bank employees form one such group with potential stressors linked to their work environment, lifestyle choices, and physiological parameters.
Study Objective: To predict risk factors for coronary artery disease (CAD) using ACSM risk factor categories amongst officer-grade bank employees in Panvel Municipal Corporation region.
Methodology: 135 officer-grade Bank Employees were included according to inclusion and exclusion criteria between the age group of 30-60 years. Bank employees were interviewed for demographic details, IPAQ questionnaire, ACSM risk factor stratification scoring, and perceived stress scale. Spearman's correlation test was carried out using Excel.
Result: Our study revealed a strong positive correlation between the physical activity questionnaire (IPAQ-SF) and ACSM risk factor stratification scoring. The present study demonstrated a high prevalence (76.30%) of CAD risk factors, Sedentary lifestyle being the most common cause (62.96%) amongst officer-grade bank employees in the Panvel Municipal Corporation region. It was observed that bank employees were exposed to a volley of problems in all three domains of health viz. Physical, mental & social owing to their demanding job profile.

Keywords: Coronary Artery Disease (CAD), Risk Factors, ACSM, Bank Employees, Cardiovascular Health.

INTRODUCTION

The burgeoning burden of coronary artery disease (CAD) in India can be explained by the alarming rise in the prevalence of coronary risk factors like Diabetes, Hypertension, Stress, Atherogenic dyslipidemia, Smoking, Obesity, and Physical inactivity. Rapid urbanization and lifestyle changes that occurred during the past two decades have led to the growing burden of coronary risk factors.[1]

The Registrar General of India reported that coronary heart disease (CHD) led to 23% of total and 32% of adult deaths in 2010-2013.[2] A consistent association between sedentary lifestyle and CHD has been demonstrated in epidemiological studies, thereby explaining the higher prevalence of CHD reported in sedentary workers.[3]

The tasks of a bank employee were clerical, managerial, and administrative jobs which mainly involved handwriting, dictating, typing, ledger keeping, cash payment receipt, and mental activities. These are usually classified as sedentary activities.[4]

Bank employees who deal with various types of customers, economic liabilities, high levels of accountability, greatly reduced physical activity, and sedentary mode of functioning may be predisposed to the development of various diseases like hypertension, obesity, and diabetes mellitus and may develop non-communicable diseases like ischemic heart disease, myocardial infarction, high levels of stress.[5] Lifestyle changes, work-life balance, altered food habits, sleep deprivation, addictions, and related disorders, primarily due to work settings are major risk factors for the development of CAD.

Bank employees have a high prevalence of risk factors for CADs; thus, they form a vulnerable population for cardiovascular diseases. Risk estimates can theoretically be used to raise population awareness of diseases (such as CAD) that cause a significant burden of morbidity and mortality, to communicate knowledge about that risk to individuals and subgroups, and to motivate adherence to recommended lifestyle changes or therapies.[6-7]

MATERIALS & METHODS

Study Design:
This was a cross-sectional study following a convenience sampling involving a population of 135 officer-grade bank employees of Panvel Municipal Corporation region. The inclusion criteria adopted the following - officer-grade bank employees, both male and females in an age group of 30 to 60 years, officer-grade bank employees who are willing to participate in this study, and those employees who have at least one year of experience, bank employees having blood glucose and cholesterol profile reports. The study excluded bank employees who have known cases of coronary artery disease and employees who have undergone PTCA or any cardiac surgeries.
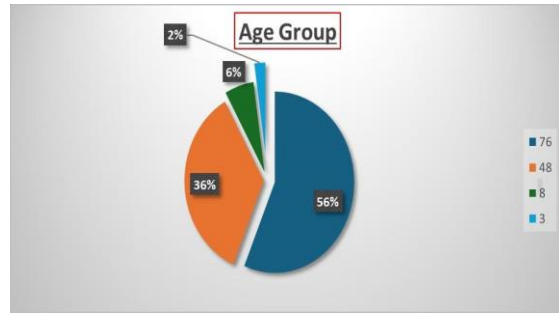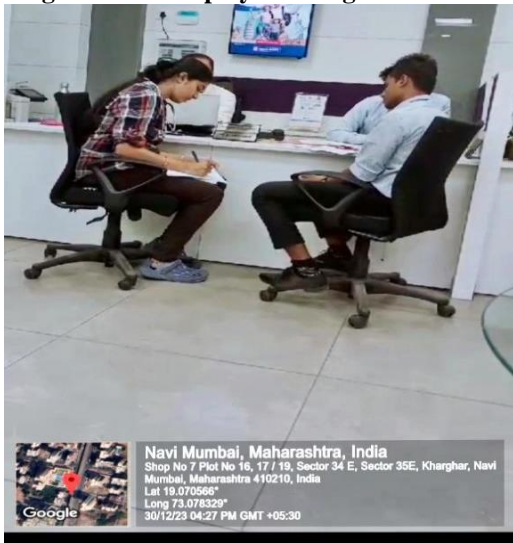
METHODOLOGY

Informed consent was taken from all subjects, demographic history of each subject was noted which included their personal details, job classification, designation, and work schedule details. Height, weight, and blood pressure were measured and Body Mass Index (BMI) was derived by Quetelet's index Weight (kg)/ Height (m^2). The subjects were then interviewed with the already validated questionnaire ACSM risk factor stratification scoring. The questionnaire was filled based on the answers given by the respondent and the investigation reports of serum cholesterol and fasting plasma glucose levels were noted. The subjects were then interviewed for physical activity in the last 7 days using the IPAQ short-form questionnaire. The subjects were then interviewed for Stress using the Cohen Perceived Stress Scale.

STATISTICAL ANALYSIS

The collected data was recorded in an Excel spreadsheet and was analyzed using MS Excel.
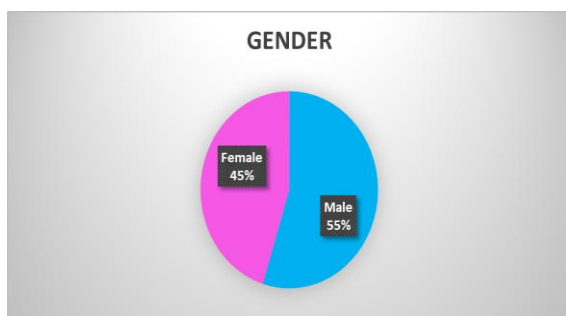
Fig A: Bank Employees being interviewed.

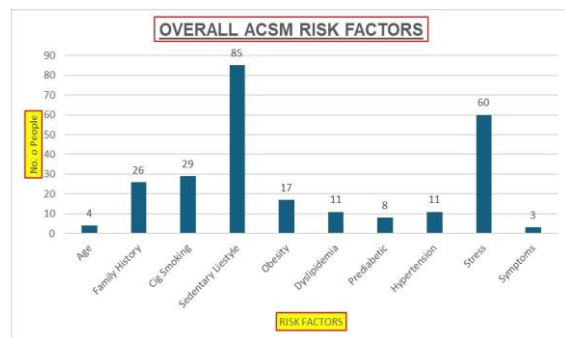| Variables	Mean	Standard Deviation
Age	31.340	6.765
BMI	25.097	4.318
ACSM score	1.318	1.117
IPAQ-SF score	1711.86	1787.04
CPSS score	17.829	6.1777

The mean value and standard deviation for Age: 31.34, ±6.765; BMI: 25.09, ±4.318; ACSM risk factor stratification: 1.318, ±1.117; IPAQ-SF: 1711.8, ±1787.0; Cohen Perceived Stress Scale: 17.82, ±6.177 respectively.

RESULT


Fig 1: Pie Chart representing Gender distribution

Among the total population (135), 74(55%) were males, whereas 61(45%) were females.

Fig 2: Pie Chart Representing Age Group Distribution

The majority of the population is in the 21-30 age group 76 (56.30%) shows the distribution of these individuals in the age groups. Those in the age group of 21-30 years comprise 76, representing 56.30% of the total. The age group of 31-40 years has 48 individuals, up to 35.55% of the total. The 41-50 age group has a total of 8 individuals, representing a percentage of 5.92, while in the 51-60 age group, there are three individuals, amounting to 2.22% of the total.

Fig. 3. Graphical representation of Overall ACSM risk factors
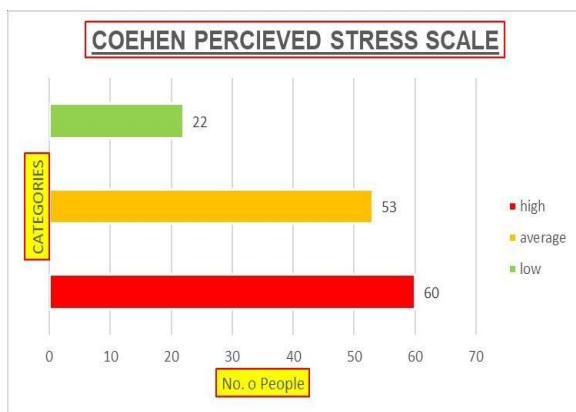
The most common risk factor in the study population was "Sedentary Lifestyle" (62.96%). Age is a risk factor for 4 in this group, which is 5.40%. Family history affects 26 individuals, or 19.26%. Cigarette smoking is a risk for 29 individuals, or 21.48%. A sedentary lifestyle is the most widespread risk factor: it can be put down as 85 individuals or 62.96%. Seventeen persons, equivalent to 12.59%, have obesity as a risk factor. Eleven persons, or 8.15%, suffer from dyslipidemia. There are eight persons with prediabetes as a risk factor, accounting for 5.92%. Eleven persons, who

make up 8.15%, have hypertension. But the most outstanding is stress, which affects 60 people and covers 44.44%. Three persons have some symptoms, about 2% of the whole.
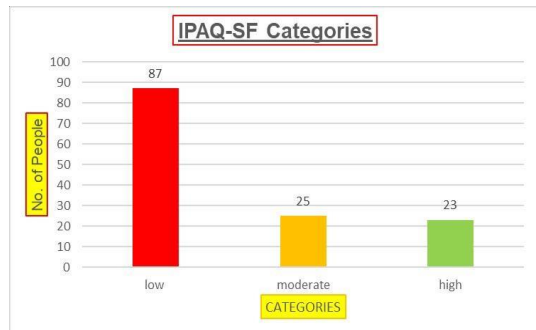
Fig 4: Graphical representation of IPAQ-SF categories

The majority (64.44%) of the study population had low levels of physical activity. The low activity category includes a total of 87 individuals, representing 64.44% of the total. The moderate activity category comprises a total of 25 individuals, accounting for 18.52%. The high activity category consists of a total of 23 individuals, representing 17.04% of the total.
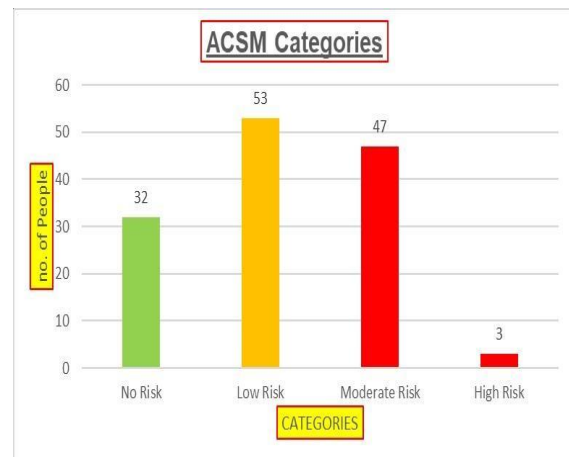

Fig 5: Graphical representation of Cohen Perceived Stress Scale

44.44% Of the total study population has high levels of Stress. The high category of CPS involves 60 persons, or 44.44%. The average category of CPS includes 53 persons, or 39.26%. The low category of CPS covers 22 persons, or 16.30%.

Fig 6. Graphical representation of ACSM risk factor stratification.

The majority (39.26%) of the study population had low-risk development of CAD. The table presents the ACSM risk categories, the number for each, and their percentage. In the 'no risk' category, there are 32 individuals, which is 23.71% of the total. 'Low risk' has 53 individuals, making up 39.26%. 'Moderate risk' encompasses 47 individuals, representing 34.81%. 'High risk' includes 3 individuals, accounting for 2.22% of the total.

Correlations

Spearman's rho		VAR00001	VAR00002
VAR00001	Correlation coefficient	1.000	-.412''
	Sig. (2-tailed)		.000
	N	135	135
VAR00002	Correlation coefficient	-.412''	1.000
	Sig. (2-tailed)	.000	
	N	135	135

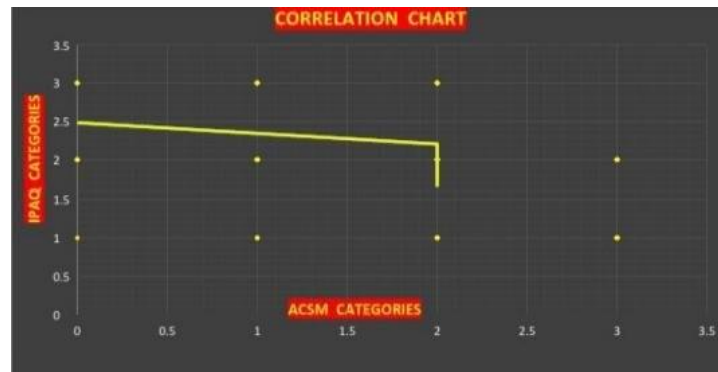**"Correlation** is significant at the 0.01 level (2-tailed).

Fig. 7. Correlation graph between IPAQ Categories and ACSM Categories.

DISCUSSION

The present study consisted of 135 officer-grade Bank employees with 74 males and 61 females. This study investigated the prediction of the risk of developing coronary artery disease (CAD) amongst officer-grade bank employees in the Panvel Municipal Corporation region. In this study, ACSM risk factor stratification scoring was used. Key findings indicate that a sedentary lifestyle was the most common risk factor, followed by stress, cigarette smoking, and family history.

The correlation between ACSM and IPAQ categories revealed a weakly moderate negative correlation, indicating that lower IPAQ values correspond to higher CAD risk in ACSM categories. A sedentary lifestyle was the most common risk encountered in the study population followed by stress, cigarette smoking, and family history. On the evaluation of results as per ACSM stratification, we noted that 32 employees (23.71%) had no risk, 53 employees (39.26%) had low risk, 47 employees (34.81%) had moderate risk and 3 employees (2.22%) had a high risk of developing CAD. As per the IPAQ category, 87 employees (64.44%) were minimally active, 25 employees (18.52%) were moderately active, and 23 employees (17.04%) were highly active. As per Cohen's Perceived Stress Scale, 60 employees (44.44%) had high stress levels, 53 employees (39.26%) had average stress levels, and 22 employees (16.30%) had low stress levels. The correlation between ACSM and IPAQ sf categories was found to be a weakly moderate negative correlation. This means that the lower the IPAQ-of values, the higher the risk of developing CAD found in ACSM categories.

Risk Factor Discussion:

- Sedentary Lifestyle: 62.96% of the study population had a sedentary lifestyle, attributed to prolonged sitting during work hours and a tendency to rest during off-hours due to job-related fatigue.
- Stress: Approximately 44.44% of the participants experienced stress due to monotonous work, high responsibilities, and extensive documentation, leading to burnout (Indian Journal of Community Health, 2021). [8]
- Cigarette Smoking: 21.48% of the participants smoked, often as a stress management tactic due to high disposable income at a young age (BMC Public Health, 2021). [9]
- Family History: 19.26% had a family history of CAD, often linked to other risk factors like diabetes and hypertension (Mayo Clinic, 2021). [10]
- Obesity: 12.59% were obese, a condition influenced by inactivity and stress eating.
- Dyslipidaemia: 8.15% had dyslipidemia, likely due to low physical activity and poor dietary habits.
- Hypertension: 8.15% suffered from hypertension, exacerbated by stress and lifestyle factors (BMC Public Health, 2021). [9]

- Prediabetes: 5.92% were prediabetic, a risk heightened by family history and physical inactivity.
- Age: 5.40% were at risk due to age, a non-modifiable factor.
- Symptoms: 2% experienced symptoms like cystic fibrosis and thyroid diseases, further increasing their CAD risk.

Overall, the study highlights the significant impact of lifestyle and occupational stress on CAD risk among bank employees, emphasizing the need for interventions to promote physical activity and stress management.

CONCLUSION

The study highlights significant CAD risk factors among officer-grade bank employees, emphasizing a sedentary lifestyle as the most prevalent, affecting 62.96% of participants. This aligns with findings that prolonged sedentary behaviour significantly elevates CAD risk due to decreased physical activity and increased work-related fatigue. Stress was the second most common risk factor, impacting 44.44% of the employees, which is consistent with research linking occupational stress to higher burnout rates and CAD risk.

Cigarette smoking was identified in 21.48% of the participants, often used as a coping mechanism for stress, highlighting the need for targeted smoking cessation programs within this demographic. Family history accounted for 19.26% of the risk, underscoring the genetic predisposition to CAD. Other notable risk factors included obesity (12.59%), dyslipidemia (8.15%), hypertension (8.15%), and prediabetes (5.92%), each contributing to the overall risk profile due to lifestyle and genetic factors.

The correlation between lower IPAQ scores and higher ACSM risk categories suggests that increased physical activity could mitigate CAD risk. These findings advocate for workplace health interventions, promoting physical activity and stress management to reduce CAD risk among bank employees. Overall, addressing these modifiable risk factors through comprehensive wellness programs is crucial for improving cardiovascular health in this population.

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