

**A STUDY ON RISK ASSESSMENT OF CARDIOVASCULAR DISEASE
AMONG CORPORATE EMPLOYEES**

Dissertation Submitted to



The IIHMR University, Jaipur

for the partial fulfillment for the reward for the award of the degree of Master
of Business Administration (MBA)

in

Hospital and Health

Management by

Dr. Jyotsna Singh

Under the Supervision and Guidance of

Dr. Tripti Bisawa

2023

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DECLARATION

I hereby declare that this dissertation titled Study on “A Study on Risk Assessment of Cardiovascular Disease Among Corporate Employees” is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.



Dr. Jyotsna Singh

31st May 2023

2nd June 2023

To whomsoever it may concern

This is to certify that Ms Jyotsna Singh has successfully completed her internship from 1st March 23 till 31st May 23 with Seva at Home India Pvt Ltd. During her internship she has worked on the project “ **A study on risk assessment of cardiovascular disease among corporate employees**”.

She was found to be hardworking and sincere during this period. We wish her the very best in all her future endeavours.

For Seva at Home India Pvt Ltd.

Shalini Gugnani
Ms Shalini Gugnani
Dy General Manager - Human Resource

CERTIFICATE

This is to certify that the dissertation titled A Study on Risk Assessment of Cardiovascular Disease Among Corporate Employees is a record of the research work undertaken by Jyotsna Singh in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur under my guidance and supervision and her approach to the research study has been sincere, scientific, and analytical.

Faculty Guide

IIHMR University, Jaipur

School Dean

IIHMR University, Jaipur

Date:

Date:

ABSTRACT

Title – A Study on Risk Assessment of Cardiovascular Disease Among Corporate Employees

Background of Study - The goal of this study is to carry out a thorough risk assessment of cardiovascular diseases (CVDs) among corporate employees in India. Cardiovascular diseases are one of the primary causes of morbidity and mortality worldwide and the corporate sector represents a significant population at risk. The study employs a cross-sectional design, utilizing the Heart risk assessment tool and health data collection to identify individual risk profiles, evaluate risk factors, and estimate the likelihood of developing CVDs among corporate employees. The findings will provide valuable insights for organizations to develop targeted interventions and promote cardiovascular health in the workplace.

Objective -

1. To determine the factors responsible for cardiovascular disease.
2. Individualized risk profiling
3. To proactively manage risk factors, promote heart-healthy behaviors, and improve the overall cardiovascular health of the workforce.

Methodology – The study duration was 60 days i.e., 19th March 2023 – 17th May 2023. The camps were organized by Seva at Home. The data was collected during the health checkup camp held in various Corporate Offices in cities i.e., Delhi, Delhi NCR, and Gurgaon on various dates. The survey was done with respect to specific objectives through a Heart risk assessment tool consisting of 21 questions. Family history and Mental health-based questions were set in the questionnaire.

Results – In this study, it was found that the prevalence of cardiovascular risk factors

among 180 participants, with a majority of 87% being male. The most prevalent risk factors identified were hypertension (25%) and smoking (21%). Other prevalent risk factors included a family history of cardiovascular disease (18%), obesity (16%), hyperlipidemia (14%), diabetes (12.7%), migraine (11%), and chronic kidney disease (4%). HTN and smoking were the most significant risk factors for developing CVDs due to their impact on atherosclerosis formation, increased blood pressure, reduced HDL (good cholesterol) levels, and increased blood clot formation. Heart risk assessment was used to categorize participants into high-risk, moderate-risk, and low-risk groups based on risk scores. The majority of participants (51%) fell within the 31-40 age group.

Conclusion – According to this research study, categorizing cardiovascular disease risk into high-risk, moderate-risk, and low-risk provides a useful framework for identifying individuals with various levels of vulnerability. This classification aids in the implementation of targeted preventive programs, early treatments, and effective management plans to help improve overall health outcomes and lessen the impact of cardiovascular disease.

Keywords – Risk Factors, Diabetes, Hypertension, Cardiovascular disease, Obesity, Cholesterol.

ACKNOWLEDGEMENTS

On the very beginning of this report, I would like to extend my sincere gratefulness and heartfelt appreciation towards all the respected personages who have helped me to attempt this endeavor. Without their active guidance, assistance, cooperation, and motivation, I would not have made an advancement in the report. It is a privilege to have a wonderful 90 da (1st March – 31th May) internship in India's leading home healthcare organization. The internship experience I had with the **SEVA AT HOME, GURUGRAM** was a great chance for growth, learning and professional evolution. I am appreciative for this chance and for getting the opportunity to meet such countless brilliant individuals and experts who directed me through this internship.

I would like to take this moment to express my deepest acknowledgment and special recognition to the Chief Operating Officer, **Mr. Atul Kishore**, who despite being outstandingly busy with his work schedule, took time to listen, direct and keep us on the rightful path and permitting us to carry our internship at the organization and guiding throughout the internship.

It is my deepest emotion to place on record my best compliments and a deep sense of gratitude to Ms. **Bindiya Reddy** (HR - General Manager) for providing necessary advice, guidance, and information during every step. I am using this opportunity to admit their contribution delightfully.

I would like to express genuine thanks to **Dr. P.R. Sodani** (President, IIHMR University, Jaipur) for giving me a chance to do a summer internship. Now, I would like to express my honest gratitude towards my mentor at IIHMR University, **Dr. Tripti Bisawa** (Professor Co-ordinator) for his support, invaluable instructions, and supervision. This report is the result of his meticulous and generous outlook.

I would also like to express a deep sense of gratitude to the Placement Cell of my esteemed university for guiding me throughout the internship process and for providing time-to-time internship guidelines.

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ABBREVIATIONS

S. No.	Abbreviation	Full Form
1.	CVDs	Cardiovascular Diseases
2.	WHO	World Health Organization
3.	AMI	Acute Myocardial Infraction
4.	BMI	Body Mass Index
5.	PVD	Peripheral Artery Disease
6.	DM	Diabetes Mellitus
7.	CAD	Coronary Artery Disease
8.	HTN	Hypertension
9.	SBP	Systolic Blood Pressure
10.	DBP	Diastolic Blood Pressure

CHAPTER - I

CHAPTER 1: INTRODUCTION

Purpose of research

The aim of this research is early diagnosis of the risk of cardiovascular disease among corporate employees using heart risk assessment and to identify the risk factors. In the entire world, cardiovascular diseases (CVDs) are the main cause of death. According to estimates, CVDs caused 17.9 million deaths globally in 2019— which accounts for 32% of all deaths. Heart attacks and strokes were responsible for approximately 85% of these deaths. The maximum number of fatal CVDs cases takes place in developing countries. In 2019, non-communicable diseases resulted in 17 million casualties prior to the age of 70, and 38% of those casualties were related to CVDs. According to the WHO, therapy and prevention might have prevented or reduced 86% of cardiovascular deaths.

A study by Dr. Richard Milani, and Dr. Carl Lavie on cardiac intervention for employees find that by the end of the six-month cardiac program, 57% of high-risk individuals had changed their status to one of low risk. The average participant's medical claim costs are reduced by \$1,421 on a yearly basis.

Heart and blood vessel problems are referred to as "cardiovascular diseases" (CVDs) which are as follows: -

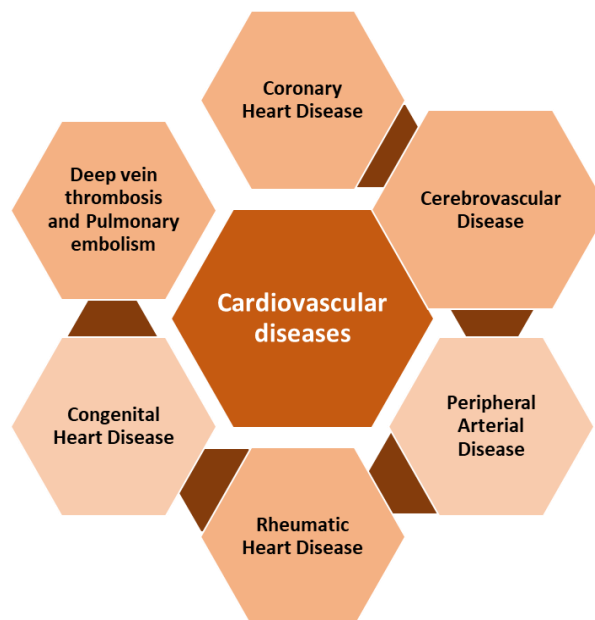


Figure 1.1



Figure 1.2

Non-modifiable risk factors for cardiovascular disease are those that cannot be changed. These factors include a person's age, color, and family history, among others (genetics cannot be changed). We can reduce or manage risk factors for cardiovascular disease by altering our behavior.

By altering certain components of their lifestyle, people can reduce their chance of developing cardiovascular disease. Examples include eating, drinking, and smoking.

Key facts as per WHO: -

1. Heart attacks and strokes account for more than four out of every five CVD deaths, and one-third of these deaths happen before the age of 70.
2. The most important behavioural risk factors of heart disease and stroke are unhealthy diet, physical inactivity, tobacco use, and harmful use of alcohol.
3. Out of the 17 million premature deaths (under the age of 70) due to non-communicable diseases in 2019, 38% were caused by CVDs.
4. Over three-quarters of CVD deaths take place in low- and middle-income countries.

5. It is important to detect cardiovascular disease as early as possible so that management with counselling and medicines can begin.

Fact Sheet for Risk Factors:

1. **Hypertension:** -Approximately 25% of adults in India above the age of 18 have high blood pressure. In India, 10.8% of all deaths are linked to hypertension. Over the past few decades, its frequency has been progressively rising in both urban and rural locations. It is anticipated that by 2025, there would be 213.5 million people carrying this load, an increase from 118 million in 2000.
2. **Smoking:** Men are currently more likely than women to smoke tobacco (23.6%), which is higher than the prevalence (22%).
3. **Diabetes:** - Above the age of 18, approximately 10% of Indians have high blood glucose levels. With approximately 73 million cases, India has the most instances of diabetes in the world in year 2017. Diabetes has become a problem in India, with an 8.8% prevalence between the ages of 20 and 70.
4. **Dyslipidaemia:** - The prevalence of high cholesterol levels, high triglyceride levels, Low HDL-C, and high LDL-C was found in the Indian population.
5. **Obesity:** - Between 30 and 65 percent of metropolitan adults are overweight or obese. Indians who live in cities have a higher body mass index (BMI) than those who live in rural areas (about 24–25).
6. **Dietary Habits and Exercise:** - Most of the Indians eat more carbohydrates, high-fat dairy, butter, ghee, and cheese at each meal. There were less than 10% of the population who participated in regular physical activity and according study conducted by ICMR-INDIAB which found that every second person was found to be physically inactive.
7. **Genetic Risk Factor:** - High familial incidence of coronary artery disease suggests a likely genetic relationship. There are numerous "candidate genes" that have been related to the pathways that cause coronary heart disease, according to numerous research.

According to the WHO, raised SBP is the leading modifiable risk factor worldwide and likely cause of premature cardiovascular deaths resulting in 10.8 million

cardiovascular deaths and 11.3 million total deaths in 2021.

Research Question: - How Heart Risk Assessment is helping in the early diagnosis of risk of cardiovascular disease among corporate employees in India?

Objectives of the Study: -

1. To determine the factors responsible for cardiovascular disease.
2. Individualized risk profiling
3. To proactively manage risk factors, promote heart-healthy behaviors, and improve the overall cardiovascular health of the workforce

CHAPTER - II

CHAPTER 2: LITERATURE REVIEW

Table 2.1 – Literature Review

1.	Title	Authors	Place	Sample Size	Findings
	“Study of cardiovascular risk factors among tertiary hospital employees and their families.”	Divya Sharma, Manju Vatsa, Ramakrishna Lakshmy, Rajiv Narang, Vinay Kumar Bahl, Sanjeev Kumar Gupta	AIIMS New Delhi	453	1. According to this study, cardiovascular risk factors are very prevalent, including hypertension, obesity, and being overweight. 2. The prevalence of diabetes in the family was highest, followed by hypertension and CAD.

Reference: Sharma D, Vatsa M, Lakshmy R, Narang R, Bahl VK, Gupta SK. Study of cardiovascular risk factors among tertiary hospital employees and their families. Indian Heart J [Internet]. 2012 [cited 2023 May 30];64(4):356–63. Available from:

<http://dx.doi.org/10.1016/j.ihj.2012.06.001>

Keywords: Cardiovascular risk factors, Coronary artery disease, Prevalence

2.	“A survey of non-communicable diseases and their risk factors among university employees.”	Agaba Emmanuel, 2017	University of Jos, Nigeria	883	1.This investigation assessed the frequency of NCDs and their contributing variables among students at a university. 2. In this group, this investigation discovered a considerable prevalence of NCDs and related modifiable risk factors. It is necessary for workplace policies to promote the adoption of healthy lifestyles.
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Reference: Agaba EI, Akanbi MO, Agaba PA, Ocheke AN, Gimba ZM, Daniyam S, et al. A survey of non-communicable diseases and their risk factors among university employees: a single institutional study. *Cardiovasc J Afr* [Internet]. 2017 [cited 2023 May 30];28(6):377–84. Available from:

<http://dx.doi.org/10.5830/cvja-2017-021>

Keywords: Diabetes mellitus, hypertension, non-communicable disease, obesity, physical inactivity

3.	“Cardiovascular Disease Risk Factor Profiling of Group C Employees in JIPMER, Puducherry.”	K Aswin, Arun G. Ghorpade, Sitanshu Sekhar Kar, and Ganesh Kumar	JIPMER, Puducherry	400	1.40% of people with documented hypertension had uncontrolled blood pressure. This may be because there is a lack of frequent screening programs, especially in tertiary care facilities, and because personnel have less knowledge of NCDs. Therefore, early detection and management can be improved by providing health education to employees and sensitizing doctors to support screening.
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Reference: Aswin K, Ghorpade AG, Kar SS, Kumar G. Cardiovascular disease risk factor profiling of group C employees in JIPMER, Puducherry. J Family Med Prim Care [Internet]. 2014 [cited 2023 May 30];3(3):255–9. Available from:

<http://dx.doi.org/10.4103/2249-4863.141624>

Keywords: Cardio-vascular disease, employee, risk factor profile

4.	“Cardiovascular Risk Assessment and Profiling among Employees of Tertiary Care Rural Hospital: Central India.”	Anjalee Chiwhane, Gajendra Agrawal , Joel Joy Thomas , Saurbh Hadke	Sawangi, Maharashtra	290	In this study it was shown that there was a many cardiovascular risk factors, which can raise mortality and morbidity. To lessen the prevalence of diseases, regular health checkup camps should be held.
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Reference: Chiwhane, Anjalee & Agrawal, Gajendra & Thomas, Joel & Hadke, Saurabh. (2021). Cardiovascular Risk Assessment and Profiling among Employees of Tertiary Care Rural Hospital: Central India. Indian Journal of Forensic Medicine and Toxicology. volume14. 6259. 10.37506/ijfmt.v14i4.12580. Available from:

https://www.researchgate.net/publication/349944386_Cardiovascular_Risk_Assessment_and_Profiling_among_Employees_of_Tertiary_Care_Rural_Hospital_Central_India/citation/download

Keywords: Cardiovascular Risk, Hospital employee, Tertiary care

5.	“Cardiovascular disease risk factors among undergraduate medical students in a tertiary care center of eastern India: a pilot study.”	Somnath Mukhopadhyay, Anindya Mukherjee, Dibbendhu Khanra, Bious Samanta, Avik Karak & Santanu Guha	Eastern India	433	The study revealed that the high frequency of several modifiable risk factors for cardiovascular disease among the study's participants is alarming and calls for the implementation of screening programs, awareness campaigns, and monitoring activities. The medical core curriculum has to be updated and changed to emphasize awareness and prevention.
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Reference: Mukhopadhyay S, Mukherjee A, Khanra D, Samanta B, Karak A, Guha S. Cardiovascular disease risk factors among undergraduate medical students in a tertiary care centre of eastern India: a pilot study. Egypt Heart J [Internet]. 2021;73(1):94. Available from: <http://dx.doi.org/10.1186/s43044-021-00219-9>

Keywords: Cardiovascular disease risk, MBBS students, Waist-to-height ratio, Young population

6.	“High prevalence of coronary risk factors among bank employees in India.”	Vinay Rao, and Prasannalakshmi Rao	India	300	1 Approximately half of the population had several coronary risk factors, according to the research. 2. This study serves as a wake-up call to pursue proactive interventional measures to prevent the inevitable CHD from emerging in chair-bound employment.
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Reference: Rao V, Rao P. High prevalence of coronary risk factors among bank employees in India. Int J Med Public Health [Internet]. 2014 [cited 2023 May 30];4(4):500. Available from: https://www.ijmedph.org/article/431?qt-sidebar_tabs=0

Keywords: Bank employee, coronary risk factors, diabetes, hypercholesterolemia, hypertension, sedentary lifestyle.

CHAPTER - III

CHAPTER 3: METHODOLOGY

Research question

How Heart Risk Assessment is helping in early diagnosis of risk of cardiovascular disease among corporate employees in India?

Research design

A cross-sectional survey-based descriptive research design has been used for this study.

Study Setting

The study was organized in the Corporate offices through health checkup camps. The organization setting that organized these camps was “SEVA AT HOME INDIA PVT. LTD.”

Duration of the Study

The study was done from March 19th to May 17th May 2023 (60 days).

Study population

Health checkup camps were held in various Corporate Offices in cities:
Delhi NCR, Delhi, Gurgaon.

- **Inclusion criteria**

The study population consists of Employees who participated in the health checkup camps, it included – Men, Women, and elderly people.

- **Exclusion criteria**

The employees who did not attend the health check-up camp were excluded from the study.

- **Study tools**

Primary data was collected through the Heart risk assessment tool from employees who attended the health checkup camps.

- **Data Analysis tool**

All the qualitative variables were reported in counts and percentages.
The data were analyzed using Excel.

Sample Size

180 employees

Research procedures/ approaches

Quantitative Assessment was done from the data collected.

To evaluate the risk of cardiovascular disease among corporate employees the following procedure was followed:

- i. Health checkup camps were arranged at the corporate premises.
- ii. Baseline data was collected by measuring blood pressure(BP), BMI, cholesterol levels, and Random blood sugar levels.
- iii. Employees were asked to take an online Heart risk assessment that gathers

information about smoking habits, family history, past medical history, mental health other relevant factors.

Sampling Technique: -

Simple Random Sampling

Ethical considerations: -

The organization "Seva at Home" gave their permission to utilize their sensitive data for research purposes without jeopardizing their privacy or confidentiality. Participants freely participated in the health checkup camp, and the online Heart risk assessment was filled with their consent, and it was ensured that personal details were not revealed in any area of this study article, ensuring confidentiality.



Figure 3.1



Figure 3.2

CHAPTER – IV

Result: - Heart risk assessment was conducted to identify the risk factors for CVDs and to categorize the employees based on their cardiac risk scores into high-risk, Moderate-risk, and low-risk categories.

Here is detailed analysis of data obtained from heart risk assessment: -

1. Socio-Demographic Status of the study population-

The demographic status like age and gender were analyzed through the graphs below-

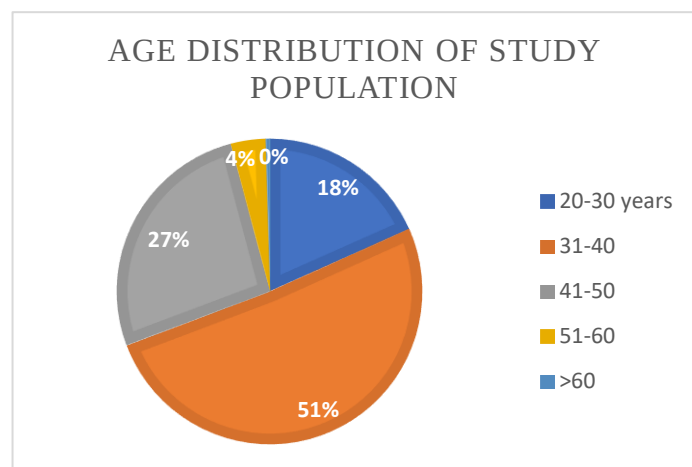


Figure.4.1 Age Distribution

The majority of participants, or 51%, are shown in the above graph to be between the ages of 31 and 40. 27% of the population was between the ages of 41 and 50, while 18% was between the ages of 20 and 30. Similarly, 4% of respondents were in the 51–60 age range.

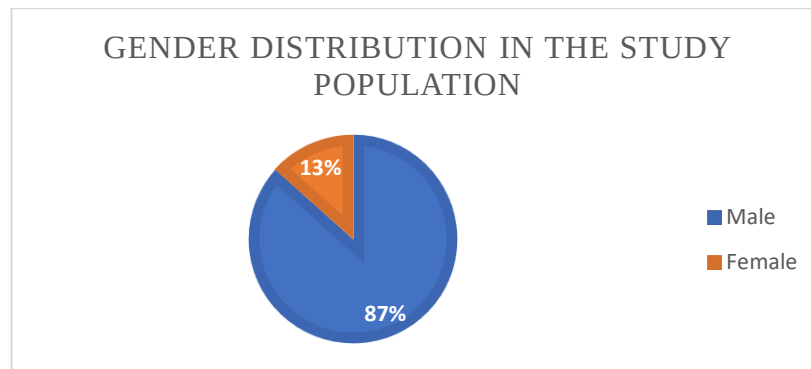


Figure 4.2 Gender Distribution

The graph depicts the gender distribution among 180 participants, with 87% male and 13% female. This was done to investigate if there was any relationship between age and gender and the risk of developing CVDs.

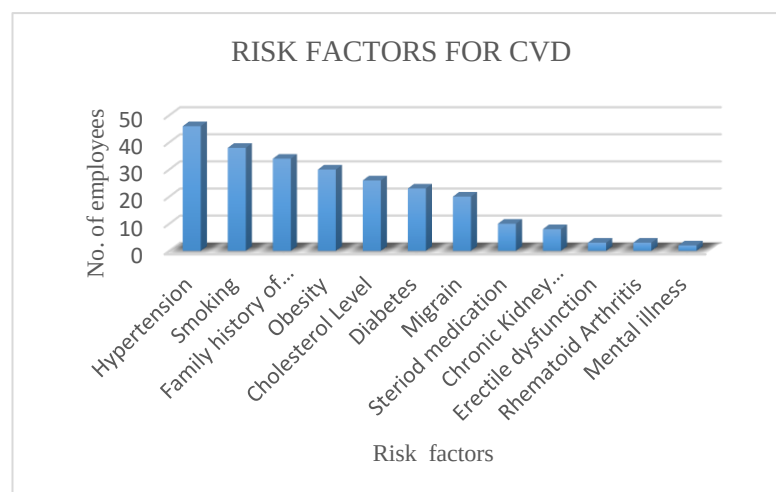


Figure 4.3. Overall Analysis of Risk Factors for CVDs

The graph depicts that out of a total of 180 employees, 46 employees (25.5%) have High blood pressure (> or equal to 140/90 mm hg). 38(21%) employees are either light smokers or moderate smokers. 34(18%) employees have a family history of CVDs. 30(16%) employees have a BMI greater than 30kg/^2 placing them in the obese category. 26(14%) employees have high blood cholesterol HDL ratio. Diabetes either Type 1 or Type 2 is detected in 23(12.7%) employees. 20(11.11%) employees complained of migraine. 10(5.5%) employees are on steroid medication. 8(4.4) employees have a history of chronic kidney disease. 3(1.6%) employees have a history of rheumatoid arthritis and erectile dysfunction. 2(1.1%) employees reported mental illness.

In the study, employees were classified into three risk categories based on a comprehensive assessment that took into account factors such as BP, diabetes, cholesterol level, smoking status, family history of CVDs, and any other diseases associated.

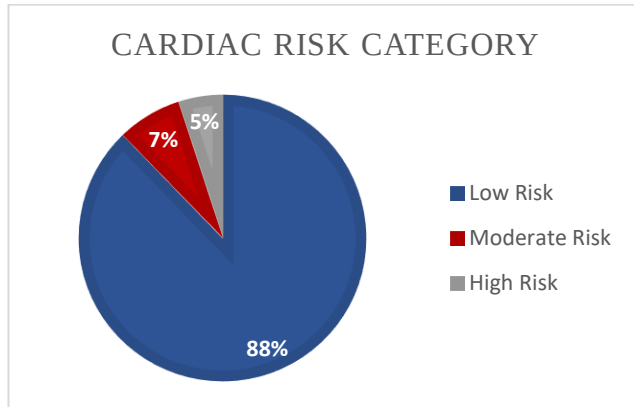


Figure 4.4 Cardiac risk category

Total 180 employees participated in the study out of which 9 (5%) were at high risk of developing CVDs, whereas, 13 (7%) were at moderate risk of developing CVDs and, 158 (88%) were at low risk of CVDs.

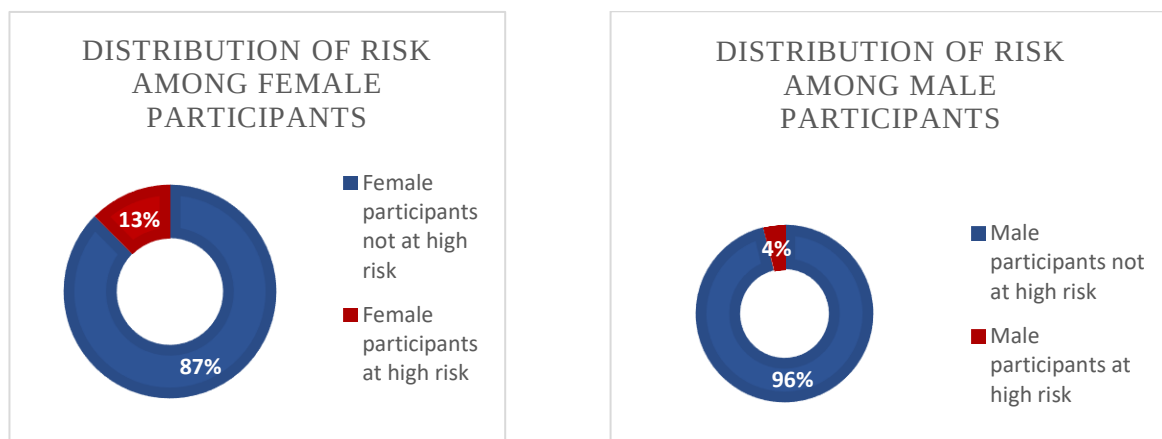


Figure. 4.5 Gender distribution for High risk

The graph depicts that 13% of females are in high risk category whereas 4% of males are at high risk category.

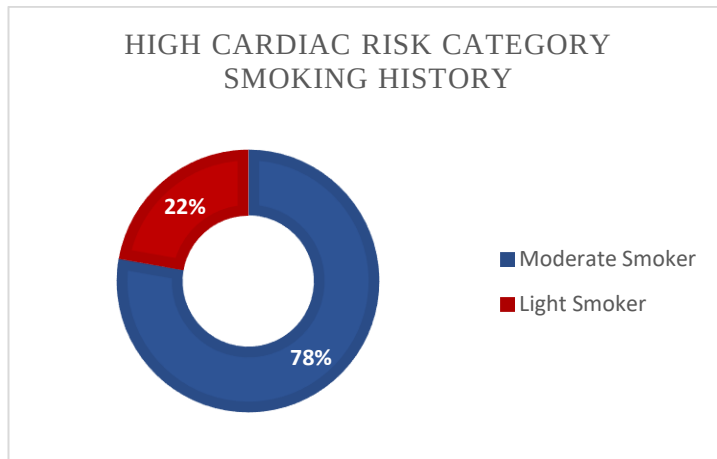


Figure. 4.6 Smoking history of participants in high-risk category

Smoking is a risk factor for CVDs. Over time, smoking can contribute to sustained high blood pressure which is a significant risk factor for CVDs which can lead to stroke and heart attack. The graph depicts that 78% of employees are moderate smokers and 22% of employees are light smoker.

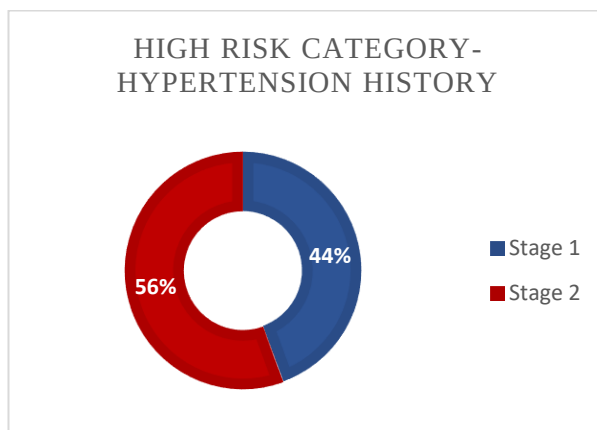


Figure 4.7 HTN history among participants in the high-risk category

HTN is a common risk factor for CVDs. HTN can contribute to the development CVDs such as increased risk of CHD, and stroke HTN is the modifiable risk factor for stroke, heart failure, atherosclerosis kidney disease, and other CVDs. The assessment conducted revealed that 56% of employees have Stage 1 HTN and 44% of the employees have Stage 2 HTN.

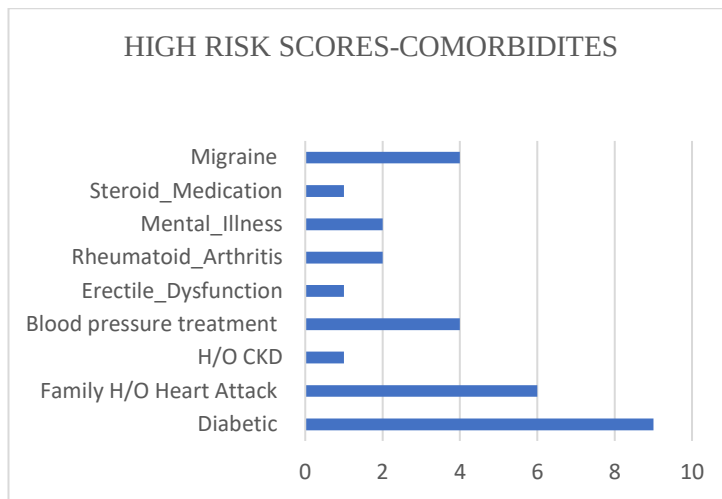


Figure 4.8 High risk participants with comorbidities

In the study a subset of participants were identified as high risk due to presence of comorbidities such as diabetes (5%), family history heart attack (3.3%), family history of chronic kidney disease (4%), rheumatoid arthritis (2.2%), migraine (2%), mental illness (1.1%).

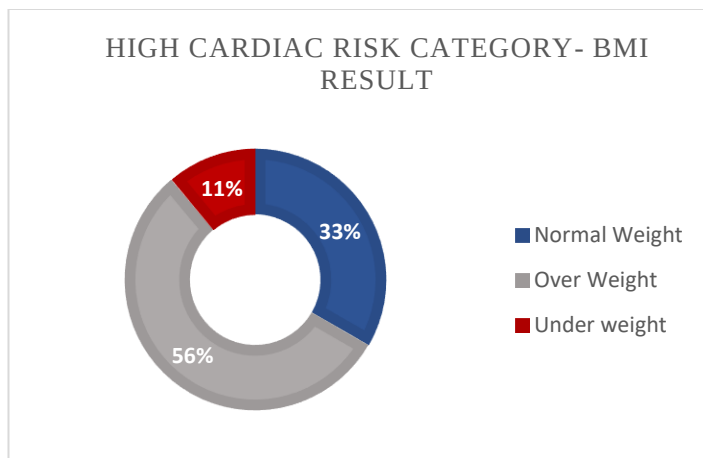


Figure 4.9 BMI result for high-risk participants

The graph depicts the BMI results for the high-risk category employees showing 56% of employees Overweight (BMI between 25 and 29.9), 33% normal weight (BMI 18.5 - 24.9), and 11% Underweight (BMI less than 18.5).

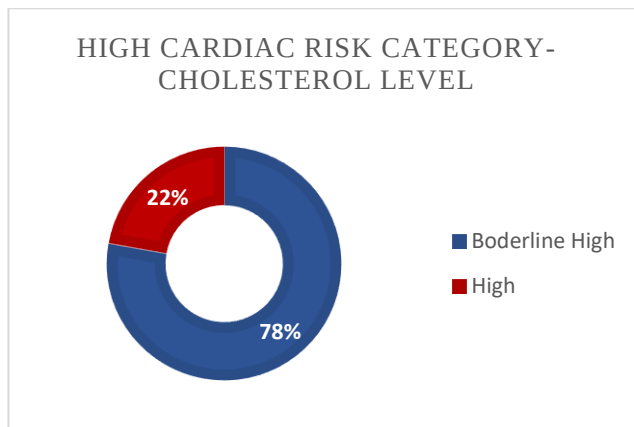


Figure 4.10 Cholesterol level in high risk participants

The Graph depicts the majority of employees in high-risk have high cholesterol levels 78% of employees have high cholesterol (240 mg/dl and above), 22% of employees have borderline cholesterol levels (200-239 mg/dl).

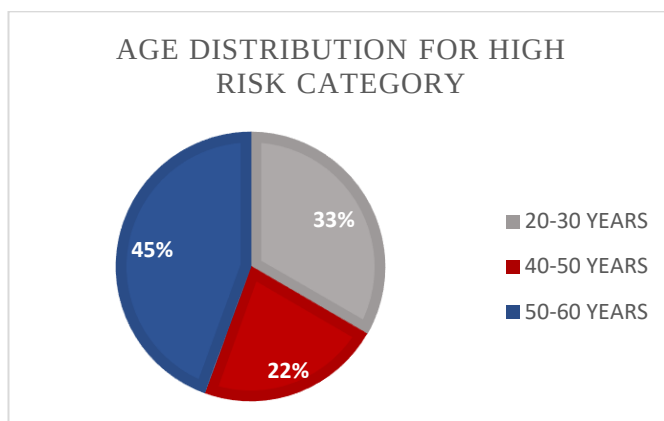


Figure 4.11 Age distribution for participants in high risk

The graph depicts that the majority of employees in the high-risk category belong to 50-60 years (45%) followed by 20-30 years (33%) and similarly 22% belong to the age group 40-50 years.

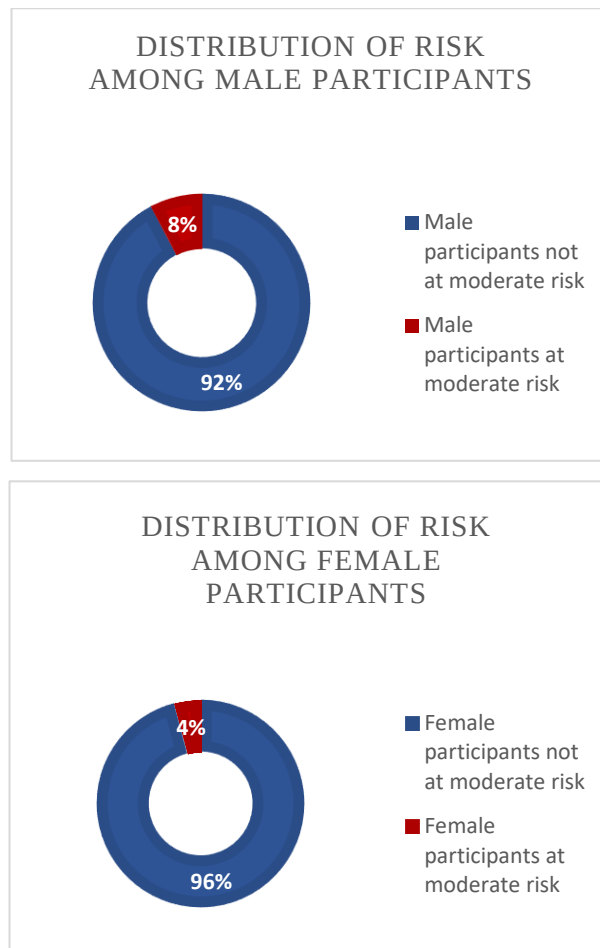


Figure 4.12 Gender classification for moderate risk category

The graph depicts that 4% female are in moderate risk category and 8% male are in moderate risk category.

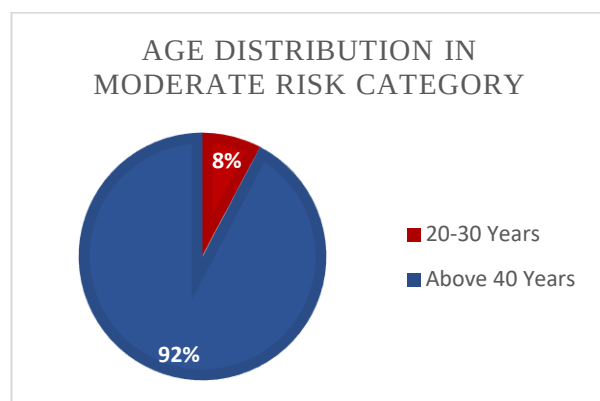


Figure 4.13 Age distribution in moderate risk category

The graph shows that the majority of the employees in the moderate risk are above the age of 40 years (92%) and between 20-30 years there are only 8% of employees.

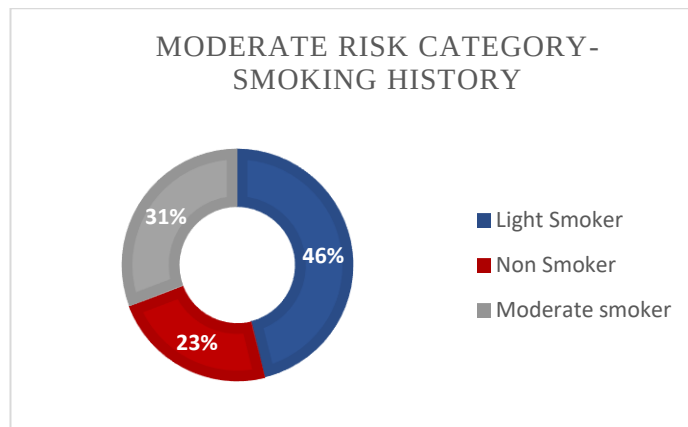


Figure 4.14 Smoking History of Participants in moderate risk Category

The graph depicts that the majority of 46% of employees in the moderate risk category are light smokers whereas, 31% of the participants are moderate smokers and 23% of employees are non-smokers.

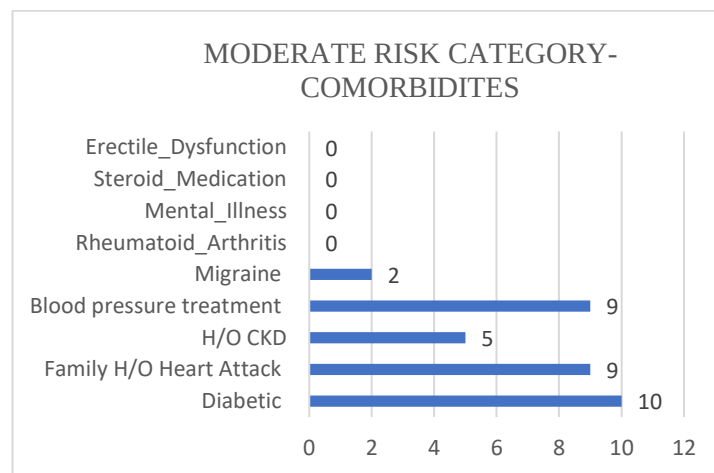


Figure 4.15 Comorbidities for moderate risk category

Comorbidities, or the presence of multiple medical conditions, can significantly increase the risk of cardiovascular diseases (CVDs) in individuals. In this study it was found that moderate risk category employees 5% were on blood pressure treatment, 5.5% of employees were having diabetes, 5% of employees were having family history of CVDs, 2.7% of employees were having a family history of CKD.

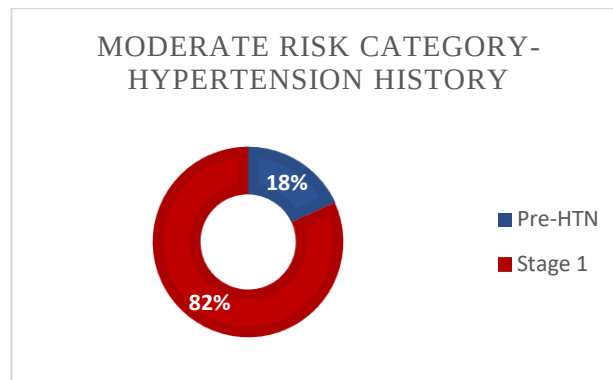


Figure 4.16 Hypertension history for moderate risk category

The graph depicts that the majority of employees were stage 1 hypertensive (82%) and 18% had Pre-hypertension.

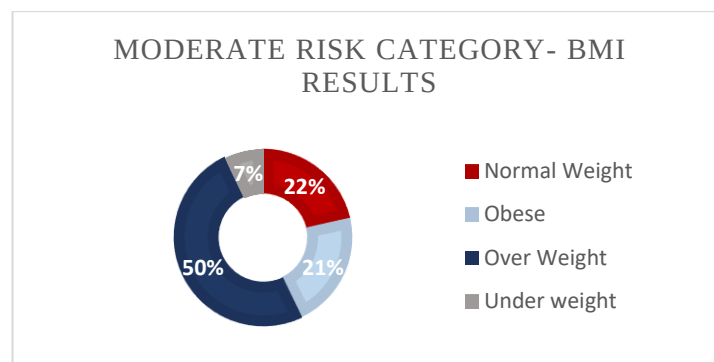


Figure 4.17 Moderate risk category BMI result

The graph depicts that 50% of employees were overweight and 21% of employees were obese, 22% of employees have normal weight and 7% of employees were under weight.

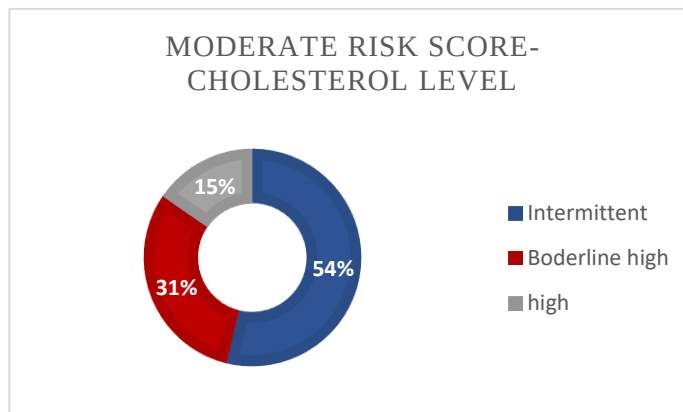


Figure 4.18 Moderate risk category Cholesterol level

The graph depicts that the majority of employees had a cholesterol level in the intermittent range, 31% employees had cholesterol level in the range of borderline high and 15% of the employees had high level of cholesterol.

Discussion

The current study found a significant prevalence of cardiovascular risk factors, including hypertension (25%), smoking (21%), CVD family history (18%), obesity (16%), hyperlipidemia (14%), diabetes (12.7%), migraine (11%), and chronic kidney disease (4%).

In this study, data acquired through heart risk assessment assisted in categorizing personnel as high-risk, moderate-risk, or low-risk based on cardiac risk scores.

According to this survey, 180 employees participated, with 87% being male and 13% being female. The majority of participants (51%) are between the ages of 31 and 40.

According to the findings of this study, 5% of 180 employees were at high risk of getting CVDs, 7% of employees were at moderate risk, and 88% of employees were at low risk.

In this study, it was found that 13% of females were reported to be in the high-risk category whereas 4% of males were reported to be in the high-risk category and most of the high-risk employees are between the ages of 50 and 60. The maximum number of high-risk employees were moderate smokers, and 56% of high-risk employees had stage 2 hypertension. Diabetes (5%), a family history of heart attack (3.3%), and 56% of employees being overweight were also risk factors in the high-risk category.

According to this survey, 4% of females are in the moderate risk category and 8% of males were in the moderate risk category. The majority of employees (92%) were above the age of 40, and the majority of employees were light smokers. Comorbidities seen in the moderate risk category included 5% of employees on blood pressure medication, 5.5% of employees with diabetes, 5% of employees with a family history of CVDs, and 2.7% of employees with a family history of CKD. The majority of employees (82%) had stage 1 hypertension, whereas 18% had pre-hypertension. Most of the employees had a cholesterol level in the intermittent range, 31% had a borderline high level of cholesterol, and 15% had a high level of cholesterol.

CHAPTER VI

Conclusion and Recommendation

Individuals had a considerable prevalence of cardiovascular risk factors such as high blood pressure, smoking history, a family history of CVD, obesity, hyperlipidemia, diabetes, migraine, and chronic renal disease, according to the study. These risk factors have a significant impact on developing cardiovascular diseases.

Sustained High Blood pressure is a notable risk factor for developing CVDs. Using the high, low, and moderate risk categories for cardiovascular disease, one can identify people who are at different levels of vulnerability. With the goal of reducing the burden of cardiovascular disease and improving overall health outcomes, this classification supports the implementation of focused preventative programs, early interventions, and efficient management strategies.

The following recommendation can be made to reduce the risk of CVDs in employees.

1. **Smoking Cessation Programs:** Smoking cessation programs must be conducted in the office premises in order to minimize the prevalence of smoking, which is one of the risk factors for CVDs in the examined participant. This kind of program should provide employees with assistance, and counseling to help them quit smoking.
2. **Blood Pressure Control:** Given the prevalence of hypertension, blood pressure management must be given top priority. Hypertension can be controlled and the risk of CVDs reduced with routine screening, lifestyle modifications, and medication as necessary.
3. **Diabetes Management:** Another risk factor for cardiovascular disease is diabetes. Participants with diabetes should get medical care that entails medication, blood sugar monitoring, and lifestyle modifications like diet and exercise.
4. **Conduct awareness, wellness webinars, and health checkup camps** at regular intervals for the employees regarding health education to raise awareness about cardiovascular risk factors, and their implications, and suggest preventive strategies which an employee can adopt for healthy living. It will help to improve the overall productivity of the employees.
5. **Encourage staff to have frequent health check-ups** to evaluate their cardiovascular health. These examinations should include blood pressure, cholesterol levels, and other pertinent metrics to identify and control risk factors early on.
6. **Establish workplace wellness programs and different engagement activities** for

the employees that encourage physical activity, good nutrition, stress management, and overall well-being. These programs can help to reduce the prevalence of cardiovascular risk factors and improve the cardiovascular health of employees.

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Annexure

Questionnaire: Heart risk assessment form was used to collect the responses of the participants

The screenshot shows a digital form titled "Heart Risk Assessment" with a sub-header "Assessment Candidate Information". The form contains eight input fields arranged in two columns. The first column includes "For Whom?" (dropdown: Self), "Gender" (dropdown: Male), "Height (in Centimeters)" (text: 172), and "Please share your smoking status:" (dropdown: Non-smoker). The second column includes "Age" (text: 50), "Ethnicity" (dropdown: Indian), "Weight (in Kilograms)" (text: 60), and "Please share your diabetes status:" (dropdown: None). Each field is preceded by an asterisk. Information icons are present next to the height and weight labels. A "Next" button is located at the bottom right of the form area. A partial footer "provider of Canada" is visible at the very bottom.

Assessment Candidate Information	
* For Whom?	* Age
Self	50
* Gender	* Ethnicity
Male	Indian
* Height (in Centimeters) ⓘ	* Weight (in Kilograms) ⓘ
172	60
* Please share your smoking status:	* Please share your diabetes status:
Non-smoker	None
Next	

provider of Canada

Heart Risk Assessment

Let's try to understand your Heart better.

The answers will help us assess your "Heart Health" in a better way!!

Do you have a close relative (mother, father, sister or brother) under 60 who has cardiovascular disease?

☐

No

The 3 types of cardiovascular disease (disease of the heart or the blood vessels) are:

- coronary heart disease - this can cause angina or heart attack
- stroke
- peripheral arterial disease, also known as peripheral vascular disease

Have you been diagnosed with atrial fibrillation?

☐

No

Atrial Fibrillation condition causes your heart to beat faster or irregularly, which can cause problems including dizziness, shortness of breath and tiredness. It may affect your heart health.

Do you know your blood pressure?

☐

No

A blood pressure test measures the force that your heart uses to pump blood around

Heart Risk Assessment

Do you know your blood pressure?

☐

No

affect your heart health.

A blood pressure test measures the force that your heart uses to pump blood around your body.

Do you take, or have you ever taken, medicine for your blood pressure?

☐

No

If you have ever been prescribed any medicine to help lower high blood pressure, then answer yes to this question

Do you know your cholesterol?

☐

No

Cholesterol is a type of fat in your blood. If it's too high, it can cause heart problems. You need a blood test to know your cholesterol.

Next

Heart Risk Assessment

Please share additional health information that may impact heart health

Have you been diagnosed with rheumatoid arthritis?



This condition causes pain, swelling and stiffness in the joints. It usually affects the hands, feet and wrists. It may affect your heart health.

Have you been diagnosed with chronic kidney disease?



This condition affects how well your kidneys work. It may affect your heart health.

Do you get severe headaches (migraine) on a regular basis?



Severe headaches of varying intensity, often accompanied by nausea and sensitivity to light and sound may impact heart health.

Have you been diagnosed with mental illness?



Severe mental illness includes schizophrenia, bipolar disorder and moderate/severe depression may impact heart health

Heart Risk Assessment

Have you been prescribed atypical antipsychotics medications?



No

The atypical antipsychotics, also known as second generation antipsychotics and serotonin-dopamine antagonists, are a group of antipsychotic drugs largely introduced after the 1970s and used to treat psychiatric conditions. Their use may impact heart health.

Have you been taking steroids medication to manage pain?



No

The usage of steroids to treat long-term inflammatory diseases such as rheumatoid arthritis or inflammatory bowel disease have an **increased risk of heart disease, stroke, and other cardiovascular disease**

Have you been diagnosed or on treatment for Systemic lupus erythematosus (SLE)?



No

Systemic lupus erythematosus (SLE) is an autoimmune disease that primarily affects young women. Cardiac involvement in patients with SLE can involve all components of the heart, including the

Heart Risk Assessment

Have you been diagnosed or on treatment for Systemic lupus erythematosus (SLE)?



No

Systemic lupus erythematosus (SLE) is an autoimmune disease that primarily affects young women. Cardiac involvement in patients with SLE can involve all components of the heart, including the pericardium, conduction system, myocardium, valves, and coronary arteries

Have you been diagnosed or on treatment for Erectile Dysfunction?



No

Erectile Dysfunction (ED) may be an early sign of heart disease in men. In addition to heart disease, ED can also happen as an early warning of a more serious illness, like: atherosclerosis (hardening or blocked arteries), high blood pressure or high blood sugar from Diabetes.

Next

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