

Prevalence Of Cardiac Diseases, Their Associated Risk Factors And Complications In Adults

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Abstract

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It is estimated that cardiovascular diseases (CVDs) are the most common causes of death globally, and it is mostly seen in low- and middle-income countries like Pakistan. Our study focuses on to assess the prevalence of cardiac diseases among adults in Peshawar, Khyber Pakhtunkhwa, to explore associated risk factors, complications, and level of awareness. For these purposes, we held a descriptive cross-sectional study among adults aged 30 years and above. Our study population was 151 participants using a structured questionnaire, for data analysis we used SPSS and Microsoft Excel through descriptive statistics. Our study findings reveal that most of the respondents were between 40 and 60 years old (54.3%), male (61.6%), it's also showed that more than half of participants (56.3%) had no formal or only primary education. Most of the patients were complaint about hypertension, affecting 49.7% of the sample, while 96% reported some form of heart-related illness. Taking permanent medication rate was high, with 87.4% using prescribed drugs. Behavioral and lifestyle-related risk factors was physical inactivity (54.3%) and commonly fast-food consumption (49.7%). Moreover, smoking rate was 21.2% of total respondents, while alcohol use was only (1.3%) of study population. Study results suggest that there was 53.6% of the respondents has positive family history of cardiac diseases. Most common complication was chest pain (37.1%) and fatigue (22.5%), nearly half of participants were hospitalized with heart-related issue. Findings reveals that 59.6% of respondents were aware of heart disease, 83.4% show their interest to participate in awareness programs. The study findings indicate a high burden of cardiac disease in this population, which is strongly linked to both modifiable and non-modifiable risk factors. Despite low

awareness levels, and the interest of respondents to engage in health education highlight the prompt need for targeted prevention measures and timely intervention programs in the region.

Introduction

Cardiovascular system is the system of the body that consist the heart, blood vessels, and the blood itself According to Zhou and Lin (2021), cardiovascular system is the system of the body that consist the heart, blood vessels, and the blood itself. According to CDC (2024), heart disease which is one of the leading cardiovascular diseases, is one of the causes of death for men and women. In the study conducted, it was found out that one person dies every 33 seconds from cardiovascular diseases. In 2022, 702, 880 people died from it, so it's 1 in every 5 deaths. In a study conducted by Samad and Hanif (2023), cardiovascular diseases are on the rise in Pakistan. In accordance with the 2019 Global Burden of Disease study, the estimated age-standardized incidence of cardiovascular diseases in Pakistan was 918.18 per 100 000 and the death rate was 357.88 per 100 000.

In the cardiovascular system, it may have a wide array of problems that can arise within the system which may include the endocarditis, conduction system abnormalities, and rheumatic heart disease. Cardiovascular disease or also known as heart disease, has the following 4 entities: coronary artery disease (CAD) which also refer to as coronary heart disease (CHD), cerebrovascular disease, peripheral artery disease (PAD), and aortic atherosclerosis Lopez, *et al.*, (2023). Moreover, acute myocardial infarction (AMI), also known as heart attack, is usually caused by reduced or complete blockage of blood flow to the myocardium of the heart, which leads to the death of heart muscle tissue (Saleh & Ambrose, 2018).

Another type of cardiovascular diseases is Angina that has been considered to be caused mainly by atherosclerotic obstructive coronary artery disease (CAD) Shimokawa, *et al.*, (2021). The main symptom of ischemic heart disease which is caused by a mismatch between oxygen demand and supply. Nearly half the patients with angina, epicardial coronary stenoses are the responsible. However, in several cases, symptoms may underlie to coronary vasomotor disorders (Manfredi, *et al.*, 2022). Due to the variations in study design the prevalence of cardiac diseases is differ between countries and studies. Heart failure is a common condition among older adults that associated with one-year mortality rate Emmons -Bell, *et al.*, (2022). It is estimated that there are 17.5 million deaths occurred due to the cardiovascular diseases worldwide. In 2012, a report shown some important risk factors which leads cardiac disease are include physical inactivity, poor diet, alcohol consumption and cigarettes smoking Hassan *et al.*, (2023). According to Samad & Hanif (2023) a survey conducted by the National Socioeconomic Registry which covers demographic, educational, health collects information from 34 million households across Pakistan in which-18.9% of participants self-reported with cardiac issues.

About 50% of risk factors are related to modifiable lifestyle factors such as physical inactivity, smoking, obesity and diabetes (Akinosun *et al.*, 2021). Systolic blood pressure is a modifiable risk which is related to advanced age increasingly contributing to coronary artery disease Shah Jehan *et al.*, (2024). In 2017 a study held by GBD stated that the deaths related to ischemic heart diseases were associated with 11 modifiable risk factors which including high systolic blood pressure, elevated LDL cholesterol, alcohol consumption, lead exposure, lack of exercise, kidney issues, increased fasting plasma glucose level, smoking, obesity, air pollution and unhealthy diet Dai *et al.*, (2020). According to the GBD 2017 study, ischemic heart disease (IHD) deaths were associated with 11 modifiable risk factors, including unhealthy diet, high systolic blood pressure, elevated LDL cholesterol, increased fasting plasma

glucose, smoking, obesity, air pollution, insufficient physical activity, kidney dysfunction, lead exposure, and alcohol intake.

The unchangeable risks factors for certain cardiac diseases include male sex, advanced age certain ethnic background and genetic predisposition to the disease. At the age 40 both men and women have lifetime chance of developing coronary heart disease is 49% for men and 32% for female respectively . For people whom age reached to 70 years, the risk of developing (CHD) is lower to 35% in men and 24 in women (Brester, *et al.*, 2022) The genetic aspects of CHD is more associated with the aggregation of various gene polymorphism rather than the direct inheritance of single gene following the Mendelian patterns (Khoja *et al.*, 2024).

The European and American guidelines of hypertension including other international organizations, agreed that that hypertensive heart diseases may involve left ventricular hypertrophy (LVH), left atrial dilatation, systolic and diastolic dysfunction including some clinical features arrhythmias, myocardial ischemia and heart failure Mesenga and Karabo (2023). Many life-threatening mechanical complications like rupturing of ventricular free-wall, ventricular septal rupture, pseudoaneurysm, true aneurysm and papillary muscle rupture are caused by myocardial infarction. Early reperfusion therapies reducing these complications to the level of less than 0.1% of cases, but the mortality related with them still remains high (Gong, *et al.*, 2020). LV pseudoaneurysm commonly develop after weeks to years after myocardial infarction, developing after cardiac rupture comprehend by pericardial adhesions. It maybe asymptomatic or may present with signs such as chronic heart failure, angina or shortness of breath (Flynn *et al.*, 2022).

Over the last 50 years scientific evidence shown the link between lifestyle pattern and the risk of developing or dying from serious cardiac issues. Many factors like personal behaviors and environmental or culture influences have a great impact on developing cardiovascular diseases (CVD) Hoskell and William (2003). Effective preventive measures like avoid smoking regular exercise, healthy diet, maintain healthy body weight and managing stress and depression. According to Yannakoulia and Panagiotakos (2019) It's estimated that 1% increase above the healthy BMI linked to roughly a 4% high risk of cardiovascular disease in both genders.

Early detection of cardiac disease and their management can prevent any complication and reducing the permanent damage Karunathilake and Ganegoda (2018). Early and prompt restoration of blood flow in the effected arteries after myocardial infarction enhance the survival rates in patient with acute ST -elevation myocardial infarction (STEMI) (Rikken *et al.*, 2023). The introduction of several pharmacological therapies and devices such as implantable cardioverter defibrillators and cardiac resynchronization therapy enhanced the survival rate among the heart failure patients. In addition, the careful application of biomarkers makes advanced and effective the patient care and increase rate of survival in heart failure HF patients (Castiglione *et al.*, 2021).

Methodology

Study Design

The study design was descriptive cross-sectional.

Study Population

The study population included adults aged 30 years and above visiting Lady reading hospital peshawar.

Sample Size

The sample size was 150 adult participants.

Inclusion Criteria

Adults 30 years and above.

Individuals diagnosed with or suspected of cardiac diseases.

Participants willing to participate in the study.

Participants who provided informed consent.

Exclusion Criteria

Individuals below 30 years of age.

Participants unwilling to participate.

Individuals with incomplete data or questionnaire.

Patients unable to respond due to severe illness.

Sampling Technique

A non-probability convenience sampling technique was used to select participants.

Data Collection Tool

Data were collected using a structured questionnaire including demographic information, medical history, lifestyle factors, family history, and complications of cardiac diseases.

Data Analysis

Data were entered, cleaned, and analyzed using Microsoft Excel and SPSS software, and results were presented using frequencies and percentages.

Result:**Table : Demographic characteristics of the participants**

Characteristic	Category	Number (n=151)	Percentage (%)
Age	<40 years	12	7.9%
	40-60 years	82	54.3%
	>60 years	57	37.7%
Gender	Male	93	61.6%
	Female	58	38.4%
Occupation	Labor/Farmer	52	34.4%
	House Wife	42	27.8%
	Teacher/Professional	28	18.5%
	Business/Other	29	19.2%
Education	None/Primary	85	56.3%
	Secondary/Graduate	66	43.7%

Table : Clinical features related to heart disease

Category	Parameter	Number (n=151)	Percentage (%)
Heart Disease	(Yes)	145	96.0%

Type of Heart Disease	HTN	75	49.7%
	MI	38	25.2%
	Angina	28	18.5%
	Arrhythmia	10	6.6%
On Medication	(Yes)	132	87.4%

Table: Size of the proteolytic zones of the bacteria isolated from garden and dairy farm

Risk Factor	Number (n=151)	Percentage (%)
Smoking	32	21.2%
Alcohol	2	1.3%
Exercise (No)	82	54.3%
Fast Food (Yes)	75	49.7%
Hypertension (Yes)	123	81.5%
Family History	81	53.6%

Table : Prevalence of Clinical Complications and Hospitalization Among Respondents

Complication	Number (n=151)	Percentage (%)	Complication	Number (n=151)	Percentage (%)	Complication
Chest Pain	56	37.1%	Chest Pain	56	37.1%	Chest Pain
Fatigue	34	22.5%	Fatigue	34	22.5%	Fatigue
Stroke	12	7.9%	Stroke	12	7.9%	Stroke

Table : Awareness and willingness toward heart diseases prevention

Category	Number (n=151)	Percentage (%)
Awareness (Yes)	90	59.6%
Willing to Participate	126	83.4%

Discussion:

Cardiovascular disease (CVD) encompasses a group of disorders affecting the heart and blood vessels, and its global prevalence continues to rise each year. It remains one of the most significant threats to human health and is consistently ranked as the leading or second leading cause of death in most countries. CVD includes a wide range of conditions, such as coronary artery diseases (e.g., myocardial infarction), as well as other cardiovascular and cerebrovascular disorders like rheumatic heart disease, cardiomyopathy, myocarditis, ischemic heart disease, stroke, and hypertensive heart disease (Rethemiotaki, *et al.*, 2024). Cardiovascular diseases (CVD) are the most prevalent non-communicable conditions globally, contributing to nearly one-third of all deaths worldwide. A range of modifiable risk factors—including body mass index, systolic blood pressure, low-density lipoprotein (LDL) cholesterol levels, tobacco use, and diabetes play a significant role in the prevalence and incidence of CVD. However, the impact of these factors can vary depending on the population studied and the methodologies employed. These risk factors form the basis of modern cardiovascular risk scoring systems, which estimate the 10-year risk of developing CVD, although each factor is weighted differently within these models (Magnussen *et al.*, 2023).

This study aimed to examine the prevalence of cardiac diseases and their risk factors among adults aged 30 and above in Peshawar, Khyber Pakhtunkhwa. Hypertension was the most common condition, affecting 49.7% of participants, while 54.3% reported a sedentary lifestyle, highlighting low levels of physical activity in the population. Hypertension is the most widespread non-communicable disease worldwide and a major predictor of cardiovascular conditions. Adopting effective self-care behaviors is essential for preventing its associated complications (Ajani *et al.*, 2021). In this survey-based study, 21.2% of participants reported experiencing angina at least once a month. Among them, 12.5% had symptoms either daily or weekly, while 8.7% experienced angina on a monthly basis. The multivariable regression analysis revealed that individuals with a history of smoking, atrial fibrillation, or chronic obstructive pulmonary disease were more likely to report frequent angina. In contrast, older age, being male, and having peripheral artery disease were linked to less frequent angina symptoms (Blumenthal *et al.*, 2021).

The most common risk factors contributing to the development of cardiovascular diseases include hypertension which serves as both a cardiovascular condition and a risk factor for others along with diabetes mellitus, dyslipidemia, obesity, smoking, and advancing age. These factors also play a significant role in the onset and progression of atherosclerosis (Ciumărnean *et al.*, 2021). A prevalence study carried out in Karachi found that general awareness of high blood pressure among patients with cardiovascular diseases was quite low. Most patients did not understand the importance of elevated systolic blood pressure, and nearly 82% did not know that high blood pressure is also known as hypertension (Iqbal *et al.*, 2023).

Fatigue is the most common and troubling symptom of heart failure. It can be caused by many factors; some related to heart failure and some not. Fatigue often leads to difficulty with physical activity, especially when it happens along with shortness of breath. These symptoms together may be early signs of muscle loss and weight loss, which suggest that heart failure is getting worse (Jurgens *et al.*, 2022). Heart disease risk factors can have different effects in different parts of the world. High blood pressure is one of the most important of these. It is linked to about 13.5% of all deaths each year worldwide and is the main risk factor for heart disease (Magnussen *et al.*, 2023). The American Heart Association introduced a straightforward tool made up of seven key factors to promote ideal cardiovascular health. These include not smoking, maintaining a healthy weight, staying physically active, eating a balanced diet, and keeping blood pressure, blood sugar, and cholesterol levels within a healthy range.

Research has shown that achieving these goals can significantly lower the risk of developing heart disease and reduce the chances of early death Yang *et al.*, (2021).

Conclusion:

Our study reveals that cardiac diseases remain highly prevalent among adults in Peshawar KPK Pakistan, and these cardiac issues are strongly linked to both modifiable and non-modifiable risk factors such as hypertension, diabetes, smoking, obesity, sedentary lifestyle, family history, and advancing age. Many complications like heart failure, angina and, arrhythmias are induced by these factors that possibly can leads to considerable morbidity and mortality. Although a majority of respondents express their willingness to participate in preventive health care programs which is really have a vital role in disease control, but gaps between awareness and understanding still persist. The interest of the public suggests opportunity for targeted interventions that favor at enhancing public knowledge about controlling risk factors. Timely management strategies are particularly significant in older adults, where is the combine effect of associated factors may increase the disease progression and make worse the health outcomes.

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