Master of Science in Public Health

Awareness and Barriers to Lifestyle Changes in Managing Cardiovascular Diseases among Patients Visiting Cardiac Hospitals, Rawalpindi

By:

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Awareness and barriers to lifestyle changes in managing cardiovascular diseases among patients visiting public cardiac hospitals, Rawalpindi

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This dissertation is the result of an independent investigation. Where my work is indebted to others, I have made acknowledgments.

I declare that this work has not been accepted in substance for any other degree, nor is it currently being submitted in candidature for any other degree.

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Date: 09-05-2022

Dedicated to the dearest father Mr. Muhammad Farooq Khan and beloved Mother Ms. Zubaida Khatoon.

ABSTARCT

Background: Cardiovascular diseases are major cause of death and disabilities in Pakistan and worldwide and burden on health care system due to CVD's is increasing day by day. Pakistan is one of the developing countries where knowledge and practices toward cardiovascular disease prevention and management is not encouraging and appreciative. It is therefore necessary to assess awareness and major barriers to lifestyle changes in managing cardiovascular diseases so that strategies and policies can be developed and implemented accordingly.

Objectives: This study aimed to assess awareness and barriers to lifestyle changes in managing cardiovascular diseases among patients visiting cardiac hospitals of Rawalpindi, Pakistan and to find association of awareness and barriers to life style changes with socio-demographic factors.

Methodology: A cross-sectional study was carried out in cardiac hospitals of Rawalpindi, Pakistan. A total of 222 respondents (aged ≥18) who visited OPDs were randomly selected for the purpose of the study. Chi-square test of association was applied to examine the association of outcome variables with socio-demographic factors.

Results: Out of 222 respondents (51.8%, n=115) were male. Most of the respondents were aged 20-56 years (61.7%). Out of total 222 respondents (46.4%, n=103) had good awareness. Chi-square test of association was run for demographic variables with computed score for awareness which showed significant association of gender, education level, working status, monthly income and residence (p = <0.05). Barrier most frequently reported to increased daily exercise was lack of time to do increased daily exercise (73%,n=162), barrier most frequently

reported to eat low fat food was it took too longer to prepare low fat food (65.3%,n=145) and barrier most frequently reported to smoking cessation was lack of motivation to stop smoking (12.60%,n=22).

Conclusion: This study demonstrated that most of the respondents had poor awareness to lifestyle in managing cardiovascular diseases and barriers most commonly reported in the current study were lack of time to do regular exercise, longer time to cook low fat food and lack of motivation to stop smoking. It was concluded that respondents with low income and education level, non-working respondents had poor awareness.

Keywords: Awareness, Barriers, Cardiac patients, Cardiac hospitals, cardiovascular diseases, Lifestyle changes, Rawalpindi.

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LIST OF ABBREVIATIONS

BRFSS   Behavioral risk factor surveillance system

BMI   Body mass index

CVD   Cardiovascular disease

CHD   Coronary heart disease

CMP   Cardiomyopathy

CARDIA   Coronary artery risk development in young adults

KAP   Knowledge attitude and practices

LMIC   Low- and middle-income countries

OPD   Outpatient department

PHC   Primary health care center

SPSS   Statistical package for social sciences

CHAPTER I: INTRODUCTION

The condition that unfavorably affects the circulatory system among human beings is known as cardiovascular disease (CVD). CVDs are a major health concern in Pakistan, and the number of patients are increasing daily (Zubair et al., 2018). Cardiovascular diseases consist of ischemic heart disease, stroke, heart failure, peripheral arterial disease, and a number of other cardiac and vascular conditions, constitute the leading cause of global mortality and are a major contributor towards the reduced quality of life (Mensah et al., 2019).

Cardiovascular Disease is a major cause of disability and premature death throughout the world and it considerably contributes to the factors that increase the costs of health care hence increasing mortality and morbidity. CVD is becoming a crisis and major cause of morbidity and mortality in every region of the world along with few exceptions i.e. sub-Saharan Africa, where infectious diseases are still the leading cause of death and while in South Korea and Japan, where cancer is found to cause more deaths (Kumar, 2017).

Throughout the globe, it is a major public health problem and is responsible for nearly half of non-communicable disease. The individuals, regardless of their country age, gender, race, background and income groups can be affected by CVD. There exists a misconception about CVD that it is a problem of rich population. In reality, it is the dominating cause of death, disability, and adjusted life worldwide. It could be prevented by incorporating population-based approaches, and by making cost-effective strategies that shall be accessible and affordable, both for people with established disease and for those at high risk of developing the cardiovascular diseases (Kumar, 2017).

The social and economic burden of CVDs in developing countries is more critical compared to the developed countries because of higher prevalence of these diseases among economically active or working population of different age group. Studies have reported that an increase in the prevalence of risk factors plays a very crucial role in causing higher burden of CVD in developing countries (Alipour et al., 2021). It is a well-established fact that most of the chronic diseases including CVDs yield common risk factors which includes physical inactivity, poor diet, smoking, and alcohol use (N et al., 2018).

The cardiovascular diseases are persistently growing as the major prevalent cause of mortality worldwide. The epidemiological transition in the 20th century has placed cardiovascular disease as a significant cause of global disability. According to the statistics related to global health projections, it is going to remain the leading cause of mortality in 2030. Cardiovascular disease and its atherothrombotic complications develop as a consequence of life style, genetic susceptibility and environmental impacts. The role of these risk factors is predominant in countries that are socio-economically lagging behind and disadvantaged i.e., countries like Pakistan. The influence of an individual risk factor on the cardiovascular disease differ greatly but due the fact, that presence numerous risk factors that works in a synergistically pattern and subsequently affects the outcome of cardiovascular disease (Liaquat & Javed, 2018).

 Presently, most of the methods used for risk assessment have been derived from outcome of studies based on the developed countries however, in low and middle income populations no algorithm has been developed yet. It had been a part of documentation that Asian region tend to have a higher burden of cardiovascular disease as compared to the western populations while much part of this burden is shared by the economically disadvantaged populations which is mainly concentrated in the South Asian region. Pakistan is included among those underdeveloped regions which are equally affected by the cardiovascular disease epidemic as the rest of the world,

whereas, there is very limited data on record regarding the underline problem (Liaquat & Javed, 2018).

Cardiovascular diseases, constitute the leading cause of global mortality and are a major contributor to reduced quality of life. In 2017, CVD caused an estimated 17.8 million deaths worldwide, corresponding to 330 million years of life lost and another estimated 35.6 million years lived with disability. Trends observed in these data provides a useful scale of where in the world cardiovascular disease related mortality and burden are rising or declining, and where progress has hindered. For instance, about 80% of the global cardiovascular disease deaths are found to occur in low- and middle-income countries (LMIC) where CVD and its risk factor burden are on the rise as a consequence of an ongoing epidemiological transition. Cardiovascular disease mortality is more common in middle income countries compared with high- or low-income countries (Collier & Kienzler, 2018; Mensah et al., 2019; Rosengren et al., 2019).

CVD in developed countries is responsible for 25% of the total deaths while 80% in middle- and low income countries. Among the global disabilities found, 85% of them are as result of cardiovascular diseases. Females are at higher risk of CVDs than males in developing countries. (Garcia et al., 2016). The risk factors related with cardiovascular disease are smoking, poor diet, high blood cholesterol levels, obesity, insufficient physical activity physiosocial stress, diabetes and ethnicity. The women of the Asian region, have high cholesterol levels and an increased systolic blood pressure that causes cardiovascular diseases. There are various differences in the morbidity and mortality rates according to gender, age, socioeconomic status, geographical location and ethnicity. The mortality rate due to CVDs is higher at younger ages. Its prevalence is higher in socioeconomically poor zones compared with wealthy areas. In Pakistan, cardiomyopathy (CMP) is the most common form of cardiovascular diseases (Zubair et al., 2018).

That among the increase in deaths globally, due to different reasons, cardiovascular disease yet remains on top of world's most significant causes of mortality and morbidity. In the past decade, the number of deaths due to cardiovascular disease has globally up to 12.5%. CVDs have equally affected countries of all income level, especially low- and middle-income countries (LMIC) contribute the greatest portion to the overall CVD burden, categorically in terms of deaths at younger ages than in high-income countries because of insufficient human and financial resources. Whereas, a lot of those countries which have larger population of low to middle income people had an increase in the overall burden of cardiovascular diseases (Rehman et al., 2021).

A number of population-based studies projected from lower income countries have suggested that the socio-demographic characteristics are associated with CVD, with increasing age, female sex and lower education consistently associated with higher prevalence of CVD. Some epidemiological evidence has also suggested that CVD is correlated with behavioral risk factors that includes smoking, alcohol use, low physical activity levels, and insufficient vegetable and fruit intake, hypertension is also credited as a very important risk factor in development of cardiovascular disease. Independently or if combined, these risk factors present an opportunity to exploit by interventions to reduce future cardiovascular disease burden (Mukhopadhay et al., 2021; Ruan et al., 2018).

Cardiovascular disease is one of the most preventable causes of death in the world, due to the fact that the majority of its risk factors are actually preventable or controllable, such as hypertension, dyslipidemia, diabetes, and obesity, and smoking, lack of physical activity, stress, unhealthy dietary practices and diabetes. The social and environmental causes of CHD and stroke are well acknowledged, and with the enhance population-based prevention programs it could conclude in a significant decrease in morbidity and mortality related to cardiovascular disease. The

knowledge about CVD and its modifiable risk factors is an indispensable proviso to change the individuals' health attitudes, behaviors and lifestyle practices. The augmentation of knowledge to the recognition of heart attack and stroke symptoms will steer to earlier presentation to medical care that may lead to better patient's outcomes. Better knowledge about cardiovascular disease risk factors among individuals will assist them to have a proactive approach in decreasing their risk since the majority of the risk factors have the provision to be modified. The estimation of the baseline knowledge about cardiovascular disease among the population has notable public health application as it helps in developing relevant and specific educational programs. Knowledge of cardiovascular disease, its symptoms and risk factors are being studied worldwide in various population. Some of these studies have focused on patients , while others have studied general populations (Al-Nafisi & Awad, 2014).

Through adequate changes in diet and lifestyle, 80% of (pre-mature) CVD mortality could be prevented. Furthermore, major cardiovascular disease risk factors that are modifiable, includes obesity, type 2 diabetes, poor dietary habits, physical inactivity, smoking as well as dyslipidemia can be targeted by certain approaches that improve lifestyle and dietary behavior (Trautwein et al., 2020).

The modifiable environmental factors that have been distinctly shown to correlate with blood pressure levels and cardiovascular disease risk are salt intake, physical activity and excessive body weight. Preventive measures to be taken includes physical activity and nutritious low-salt and low-fat diets, particularly diets low in cholesterol and saturated fats, have been investigated and established to reduce the risk and in the effective management of hypertension and coronary heart disease (Kwagyan & Randall, 2018).

Elimination of modifiable risk factors including unhealthy lifestyle accounts for the prevention of 80% of CVD cases, whereas the individuals with desirable lifestyle factors (not smoking,

physically active, healthy diet and BMI < 25) are expected to have a 67% –72% lower risk of developing heart failure, However, actual implementation and maintenance of preventive measures, e.g., lifestyle change, has proven to be challenging. Experiencing barriers to lifestyle change has been shown to prevent successful change of low exercise levels, unhealthy nutrition and/or smoking status among at-risk groups as well as in general populations (Nielsen et al., 2017)

1.1. Rationale:

CVDs constitute the leading cause of global mortality and are major contributor to reduced quality of life (Güneş et al., 2019; Mensah et al., 2019). Cardiovascular diseases are major cause of death and disabilities in Pakistan and worldwide. The burden on health care system due to CVDs is increasing day by day. Pakistan is one of the developing countries where knowledge and practices toward cardiovascular disease prevention and management is not encouraging and appreciative.

This study was conducted to find out awareness and major barriers to lifestyle changes to manage cardiovascular diseases so that strategies and policies can be developed and implemented accordingly to address this public health issue.

1.2. Objectives:

The objectives of the study were:

1: To assess awareness of lifestyle changes in managing cardiovascular diseases among patients visiting OPDs cardiac hospitals, Rawalpindi.

2: To determine barriers to lifestyle changes in managing cardiovascular diseases among patients visiting OPDs Cardiac Hospitals, Rawalpindi.

3: To find association of awareness and barriers to life style changes in managing cardiovascular diseases among patient with socio-demographic factors.

Chapter II: LITERATURE REVIEW

2.1. Cardiovascular Diseases- An Overview:

CVDs are a group of disorders of the heart and blood vessels and include coronary heart disease, cerebrovascular disease, rheumatic heart disease and other conditions. More than four out of five CVD deaths are due to heart attacks and strokes, and one third of these deaths occur prematurely in people under 70 years of age (WHO). Cardiovascular diseases yield a huge share to the growing public health challenge of non-communicable diseases. In 2019, over half a billion prevalent cases, 18.6 million deaths, and 393 million disability adjusted life years were due to cardiovascular diseases so CVDs were considered as a major contributor of adult morbidity and mortality worldwide (Hassen et al., 2022). A number of population-based studies from lower income countries have proposed that socio-demographic characteristics are associated with CVD, with increasing age, female sex and lower education constantly associated with higher prevalence of CVD. Epidemiological evidence also recommends that cardiovascular diseases are associated with behavioral risk factors such as smoking, alcohol use, low physical activity levels, and insufficient vegetable and fruit intake and hypertension (Ruan et al., 2018) . CVD has both health and social impacts. Long term treatments for cardiovascular diseases demand substantial financial resources. This could lead to poverty in low and middle income families. Widespread of CVD may ultimately increase economic burden of the country. In countries where medical and healthcare sector is not advanced, diagnosis of CVD could be late, which would lead to worsening of patient condition or even death. This could reduce the life expectancy levels in the country(Karunathilake & Ganegoda, 2018). Daily habits and actions profoundly affect the likelihood of developing CVD. Increased physical activity, proper nutrition, weight management,

avoidance of tobacco, plays an vital role in both prevention and management of cardiovascular diseases and enhance quality of life (Rippe, 2019). Awareness and knowledge plays an important role to reduce the burden of disease. Most of the studies were conducted on awareness to risk factors in preventing cardiovascular diseases but little research was conducted on barriers to lifestyle changes in managing cardiovascular diseases.

2.2. Global Burden of cardiovascular diseases:

Cardiovascular diseases endure the leading cause of disease burden in the world. CVD burden continues its decades-long rise for almost all countries outside high-income countries, and disturbingly, the age-standardized rate of CVD has begun to rise in some locations where it was previously declining in high-income countries. Prevalent cases of total cardiovascular diseases nearly doubled from 271 million in 1990 to 523 million in 2019, and the number of CVD deaths steadily increased from 12.1 million in 1990, reaching 18.6 million in 2019. The global trends for disability-adjusted life years (DALYs) and years of life lost also increased significantly, and years lived with disability doubled from 17.7 million to 34.4 million over that period (Roth et al., 2020).

2.3. Previous publications similar to this topic:

 A cross-sectional study was conducted in Jeddah during the period January 2017 to December 2017. The study included 500 participants, who were members of the public. Participants were selected through volunteer sampling, and a survey questionnaire was given to them to complete. Online survey questionnaire was used to assess participants' awareness of 14 risk factors for coronary artery disease. The risk factors involved were: smoking, lack of physical activity, fast food and soft drink intake, television and computer use; history of diabetes mellitus, myocardial infarction and stroke; as well as a family history of diabetes mellitus, diabetes, hypertension, hyperlipidemia, coronary artery disease and myocardial infarction. Regarding awareness of risk

factors, the awareness scores ranged from 1 to 8 with a mean ± SD of 4.31±1.36. None of the participants scored more than 8 points when measuring awareness. Results concluded that fast food intake was found to be the risk factor that the respondents were most frequently (74.8%) aware of and personal history of stroke was the least known CAD risk factor (0.9% respondents were aware of it). This study has shown that there is an evident lack of knowledge and awareness of CAD risk factors among the public in Saudi Arabia (Gopakumar & Sreedharan, 2019).

The descriptive cross-sectional study was conducted among participants of age 30 years and above, of both genders, who were attending primary health care center (PHC) in Dubai Health Authority from September 2020 until February 2021. Simple randomization approach was used to select the sample. A structured questionnaire designed and developed by a multidisciplinary team was used. Out of 1020 individuals approached, 738 agreed to participate in the study. The majority of participants surveyed had good knowledge of CVD (528, 71.5%). The attitude of mainstream toward CVD was Good (445, 60%). This study concluded that regarding CVD risk factors, participants had an overall good mean knowledge score; around two-thirds of the population could identify smoking, unhealthy diet (low in fruits, vegetables and high in salt and saturated fats), stress, high blood pressure, obesity, and lack of exercise as potential risk factors for CVD. However, although more than half of the current study participants had high knowledge and attitude about CVD, their behaviors is not satisfactory (Kazim et al., 2021) .

A cross-sectional study was performed among 1,424 adults of age 18 or older among selected susceptible communities. The result concluded that 21.1% of participants respectively, had good CVD knowledge (scored 80% or above). Results concluded that knowledge towards CVD risk factors and prevention was low in vulnerable communities of Antwerp and Nottingham (Hassen et al., 2022).

The cross-sectional study was conducted on CVD risk factor perceptions among Bangladeshi subjects in Queens, New York. Bangladeshi immigrants in Queens, New York were surveyed using a CVD risk factor knowledge instrument used in the Coronary Artery Risk Development in Young Adults (CARDIA) study to assess awareness of risk factors. A total of 350 patients from 3 different health centers were approached to participate and 153 agreed to participate. The proportion of Bangladeshis scoring low on the knowledge assessment was 0.53, whereas the proportion of whites scoring low in the CARDIA study was 0.32 (p value < .001). Whites were 34% more likely to score high than Bangladeshis. Bangladeshis were more likely to mention diet and cholesterol as risk factors and less likely to mention lack of exercise, being overweight, and smoking as risk factors (Patel et al., 2019).

The descriptive cross-sectional study was conducted to assess the knowledge, attitude and practice regarding modifiable risk factors of cardiovascular diseases among adults in rural community, Lahore. Participants (110) were selected using convenient sampling. The data was collected from adults of rural community Lahore using KAP questionnaire. The result showed good knowledge with (67%) high response of correct answer of "Smoking is risk factor of CVD". The attitudes were negative, (28%) high correct response for "Do exercise for good health". The practices were very poor regarding the risk-factors of cardiovascular diseases. This study concluded that knowledge of participants towards the risk factors of cardiovascular diseases was somehow better (Ejaz et al., 2018).

The community-based cross-sectional study was conducted in 2016 among randomly selected adults (>18 years). Data on socio-demographic characteristics, knowledge about CVD types, their risk factors and warning signs for CVD events was collected using a self-administered questionnaire. Results of the study concluded that out of the 1162 participants (61.7% women,

mean age 32 years), 52.5% had overall poor knowledge (mean score 12.1 on total of 25) on CVD with only about a quarter correctly identifying types of CVD. This study have found sub-optimal levels of knowledge regarding cardiovascular diseases (Aminde et al., 2017).

The cross-sectional study was conducted to disclose barriers for maintaining specific lifestyle changes by exploring associations between perceiving these barriers and various socio-demographic and health-related characteristics. A web-based questionnaire survey was used for data collection and 962 respondents were included who initially accepted treatment for a hypothetical cardiovascular risk, and who subsequently stated that they preferred lifestyle changes to medication. A total of 45% of respondents were identified with at least one barrier to introducing 30 minutes extra exercise daily, 30% of respondents reported at least one barrier to dietary change, and among smokers at least one barrier to smoking cessation was reported by 62% of the respondents. The perception of specific barriers to lifestyle change depended on socio-demographic and health-related characteristics. This study demonstrates that social inequality exists in the anticipated ability to take suitable precautionary measures through lifestyle changes to stay healthy (Nielsen et al., 2017).

A systematic review was carried out to identify the perceived barriers to smoking cessation that are common and unique to six selected vulnerable groups. The vulnerable groups selected were low socioeconomic status, Indigenous, mental illness and substance abuse, homeless, prisoners and at-risk youth. This was the first systematic review reporting perceived barriers to smoking cessation across a range of vulnerable groups. The findings from 54 qualitative, 8 quantitative and 3 mixed methods studies demonstrate that barriers to smoking cessation operate at multiple levels, including individual and lifestyle factors, social and community networks, living conditions and cultural & socioeconomic factors. Stress management, lack of support from health professionals and other service providers, and the high prevalence and acceptability of smoking

in communities were the three barriers common across all six vulnerable groups included in this review (Twyman et al., 2014).

A cross-sectional telephonic survey was conducted to assess the relationship between personal, social, and environmental barriers and meeting moderate physical activity recommendations in a sample of rural women. A telephone survey accomplished through thirteen communities that had walking trails available to community members. A modified version of the Behavioral Risk Factor Surveillance System (BRFSS) interview protocol was used for data collection. Total of 2,510 non-institutionalized, English-speaking adults aged 18 years or older were interviewed. The ten most frequently cited barriers among women in the order of most frequent to least frequent, were being too tired (70.6%), lack of time (61.1%), bad weather (59.4%), no energy (59.2%), no motivation (57.1%), don't like to exercise (47.4%), traffic in the community (42.8%), exercising at job (33.1%), no one to exercise with (33.0%), and fear of injury (31.2%). More than 50% of women identified all of the following barriers to physical activity: being too tired, lack of time, bad weather, no energy, and lack of motivation (Osuji et al., 2006) .

2.4. Conceptual Frame Work:

Risk factors

1: Modifiable   Factors

2:Non-modifiable Factors

Non-modifiable Factors

1: Age

2: Gender

3: Parental CVD

Modifiable factors
(Lifestyle risk factors)
1: High cholesterol
2: Diabetes
3: Lack of physical activity
4: High fat food
5: Hypertension
6: Obesity
7: Stress

Cardiovascular Diseases

Pharmacologic Management

Non-Pharmacological Management

Life style modification

1: Physical Activity

2: Smoking Cessation

3: Low Fat diet

4: Low salt intake

5: Stress management

Barriers To Lifestyle Changes

1: Sedentary lifestyle

2: Lack of family support

3: Lack of motivation

4: Lack of self-control

Figure 1: Conceptual Framework

2.5. Operational Definitions:

2.5.1. Cardiovascular diseases

Cardiovascular disease is the disease related to circulatory system in humans (Zubair et al., 2018). Cardiovascular diseases (CVDs) are group of disorders that involve the heart or blood vessels or both. They include coronary heart disease (CHD), cerebrovascular disease, peripheral arterial disease, rheumatic heart disease, congenital heart disease, and deep vein thrombosis and pulmonary embolism (Al-Nafisi & Awad, 2014).

2.5.2. Socio-demographic factors:

All those factors affecting awareness and barriers to lifestyle changes in managing cardiovascular diseases depending upon gender, age, socioeconomic status, occupation, income and educational level of target population are called socio-demographic factors. The factors comprised gender, residential area (urban or rural), ethnicity, age, marital status, education, occupation, and monthly household income (Mohd Ghazali et al., 2015).

2.5.3. Barriers to lifestyle changes:

Barriers to lifestyle changes are anything that causes someone to slip up in one's goal to make lifestyle changes in managing and preventing cardiovascular diseases.

2.5.4. Awareness:

Knowledge that something exists, or understanding of a situation or subject at the present time based on information or experience (Cambridge English Dictionary).

Chapter III: METHODOLOGY

3.1. Study Design:

A quantitative research approach using cross-sectional study design was carried out to assess the awareness and barriers to lifestyle changes in managing cardiovascular diseases among cardiac patients.

3.2. Study Duration:

Study period for the current research was 6 months (October 2021 - March 2022)

3.3. Study Setting:

The study was carried out at public and private cardiac Hospitals of Rawalpindi.

3.4. Research Participants:

Study participants were cardiac patients who were visiting cardiac hospital for their checkup from their consultant. Sample was selected on the basis of inclusion and exclusion criteria.

3.4.1. Inclusion Criteria:

1. Cardiac disease diagnosed at least one year ago
2. Both male and female were included in study
3. Patients of Age 18years and above

3.4.2. Exclusion Criteria:

1. Patients who were not willing to participate in the study.
2. Mentally challenged patients.
3. Patients who didn't understand Urdu language.

3.5. Sample Size Calculation:

Sample size was calculated using proportion formula for sample size calculation in 'OpenEpi menu', Version 3 software. Sample size of 222 was calculated by adding prevalence 17.5% with 95% confidence interval (C.I) and 5% margin of error (Zubair et al., 2018).

3.6. Sampling Strategy:

Desired sample was collected using non-probability consecutive sampling strategy.
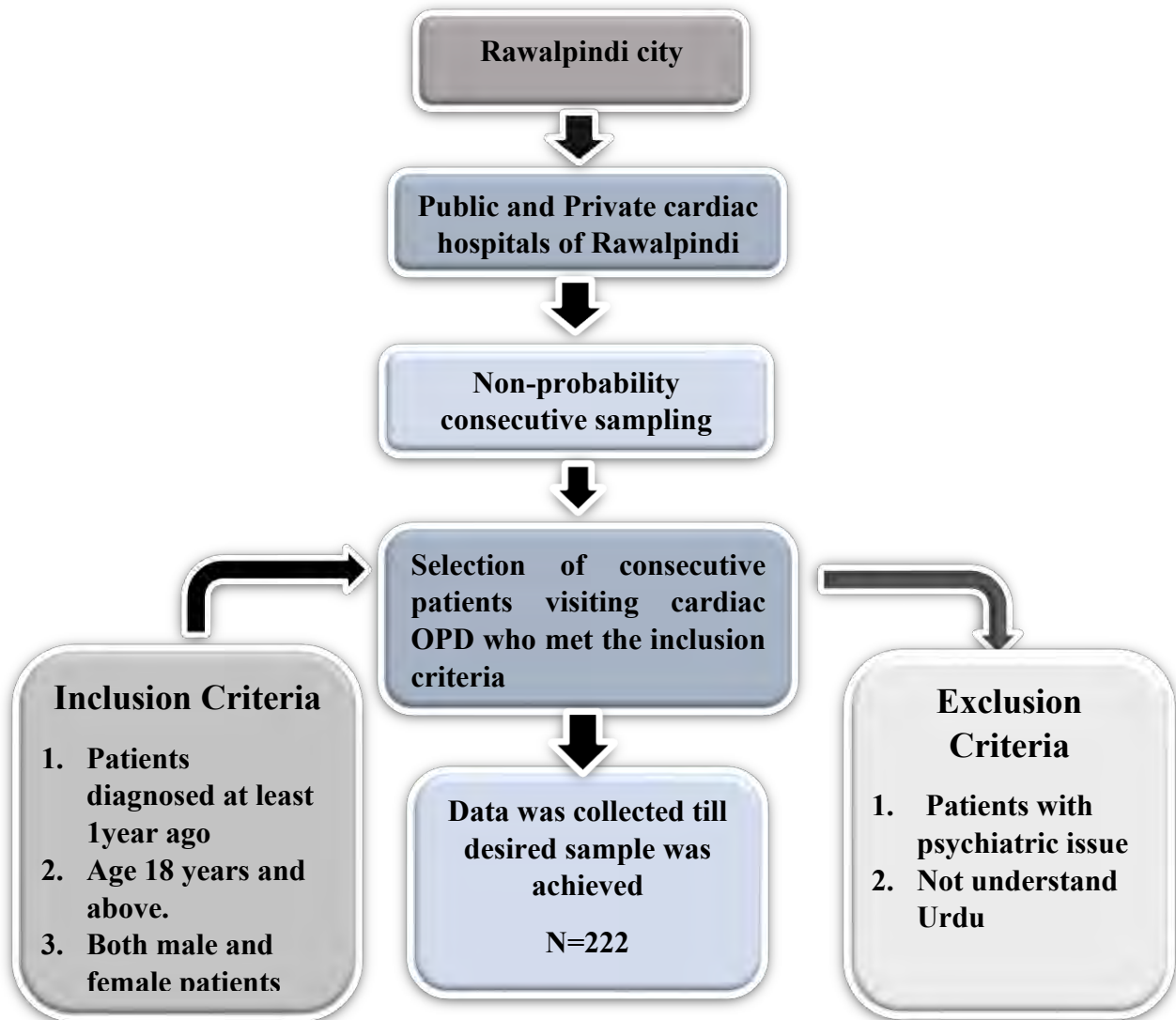
Figure 2: Non-Probability Consecutive Sampling Strategy

3.7. Data Collection Instrument:

3.7.1. Questionnaire Design:

Data was collected using an interview-based questionnaire in which the researcher asked the questions from the respondents and recorded their responses accordingly. Questionnaire was devised after going through different research papers. A Performa was developed to collect data regarding socio-demographic characters of the respondents, awareness to lifestyle changes / risk factors and barriers to lifestyle changes in managing cardiovascular diseases (Erhardt et al., 2004; Nielsen et al., 2017).Validity of questionnaire was checked through public health specialist and public health care providers.

Pilot study was carried out and structured questionnaires were filled from 10% of total sample size and tool was devised in pilot testing. After finalization of research questionnaire, data was collected. Questionnaire is attached as Annexure-B.

3.7.2. Content of the Questionnaire:

The questionnaire contained four major sections:

1. First part included questions related to socio-demographic characteristics.
2. Second part included questions on awareness to lifestyle risk factors and changes in managing cardiovascular diseases.
3. Third part included questions on barriers to lifestyle changes in managing cardiovascular diseases.

3.7.3. Study Variables:

3.7.3.1. Outcome variable:

The major construct of the questionnaire was to assess awareness and barriers to lifestyle changes in managing cardiovascular disease. The outcome variable were awareness and barriers to lifestyle changes in managing cardiovascular diseases which were measured using questionnaire adapted from previous studies. The questionnaire has three parts.

1. Socio-demographic Factors (independent Variable)
2. Awareness to lifestyle risk factors and lifestyle changes in managing CVD (Outcome variable) (Erhardt et al., 2004)
3. Barriers to lifestyle Changes in managing CVDs (Outcome Variable) (Nielsen et al., 2017)

3.7.3.2. Independent Variable:

Data on independent variables was collected through a structured Performa that is constructed after international and national literature review. The Performa included socio-demographic variables such as gender, age, education level, marital status, place of residence etc. in addition to these it also included some variables related to health status, physical activity and other comorbidities.

3.8. Data Collection Process:

3.8.1. Pilot Testing:

Pilot testing was performed before starting the formal data collection procedure by including 10% of the actual sample size. Reliability was checked after entering data into SPSS. The value of Cronbach's alpha for section B (Awareness to lifestyle changes in managing CVDs) was 0.68 and value of Cronbach's alpha for section C (Barriers to lifestyle changes in managing CVDs) was 0.66.

3.8.2. Formal Data Collection:

Data was collected by the researcher herself and no data collectors were hired. All the patients visiting outpatient cardiac hospital met inclusion criteria were approached. Consent was taken orally from all patients and only those patients were selected who agreed to take part in the research process. After taking the consent, the patients were interviewed and their responses were recorded by the researcher. Data collection was completed in approximately two months. All filled questionnaires were kept protected in plastic files and no one had access to it other than the researcher.

3.9. Data Management:

Data was entered and recorded into statistical package for social sciences (SPSS) version 26.0. Code book was generated for all the variables in the questionnaire. Data was rechecked for any error, discrepancies or completeness by spot checking method. Data was stored in a separate storage device to avoid any loss in future.

3.10. Data Analysis Procedure:

Code book was developed and data was entered in Statistical Package for Social Sciences (SPSS) version 26. After careful data entry, data was checked for any error before proceeding to the further analysis. After data cleaning, data transformation was carried out for certain variables. Data analysis was done in two phases; descriptive analysis and inferential analysis.
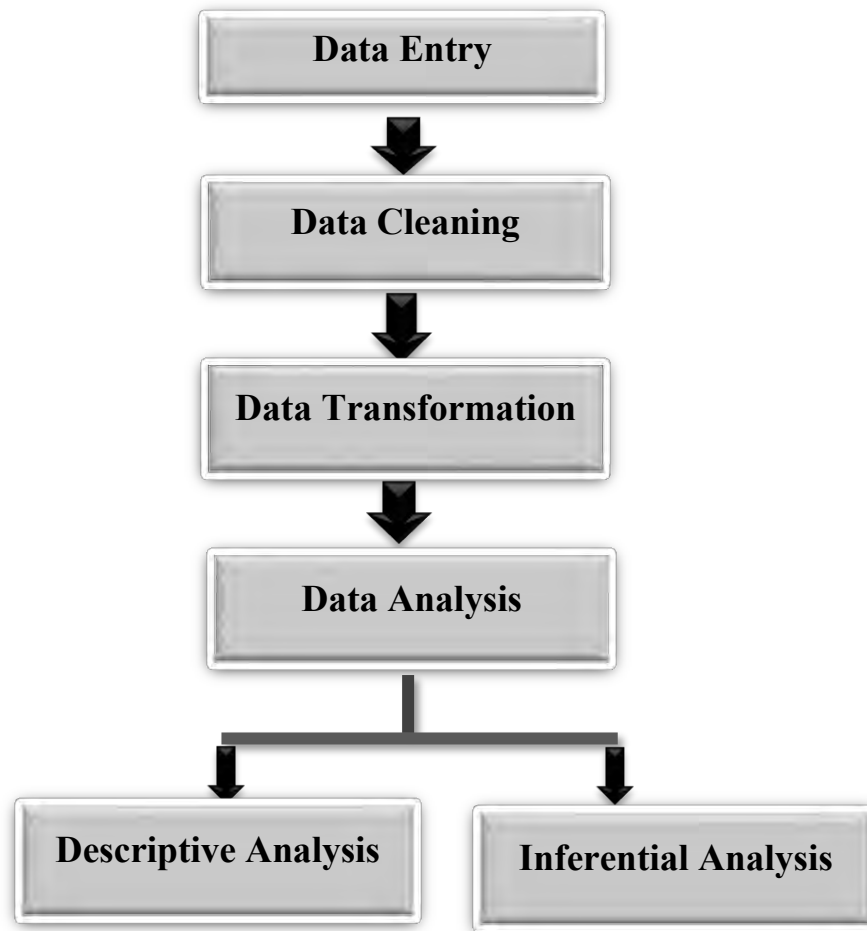
Figure3: Data Analysis Plan

3.10.1. Descriptive Analysis:

Descriptive statistics were generated for socio-demographic characteristics and awareness and barriers to lifestyle changes. For categorical variables, data was summarized in the form of frequencies and percentages and presented in table form, Bar chart and Pie chart. Frequencies and percentages were also reported.

Codes were assigned as per used in the tool. Lowest score was given 0 code and 2 for the highest. By adding up the scores, respondents were divided in 2 groups using median as a cutoff point which was 14.

Respondent with score greater than 14 were considered as having good awareness and respondents with score less than 14 were considered as having poor awareness to lifestyle changes in managing cardiovascular diseases. Based on the reviewed literature, three types of lifestyle change were selected together with two-three specific potential barriers to maintaining each of these changes. The respondents were asked to state which barriers applied to them. Three lifestyle changes selected were:

1. Increased daily exercise
2. Low fat diet
3. Smoking cessation

Data analysis was divided into 3 stages:

1. Descriptive was run for socio-demographic variables that were age, gender, marital status, educational attainment, residence, physical activity, daily exercise, working status, and smoking
2. Descriptive analysis was run for outcome variables

3.10.2. Inferential Analysis:

3: In third step chi- square test of association was run for demographic variables with computed score for awareness. A significant value of $p \leq 0.05$ was used for all statistical analysis.

3.11. Ethical Considerations:

Before starting formal data collection, approval from Institutional Review Board (IRB) of Al-Shifa School of Public Health Rawalpindi, Pakistan has been taken. Permission letter from the Head of Department of Al-Shifa School of Public Health was obtained regarding access to various cardiac centers. Permission was taken from the cardiac centers of Rawalpindi city for conducting research. Patients were explained the purpose of the research and oral consent was taken from each participant. Participants were assured for the confidentiality of their data. Data collected from the respondents was kept anonymous and was not shared with anyone. Data was entered in SPSS anonymously. After data entry, hard copies of collected were kept at a safe place.

CHAPTER IV: RESULTS

4.1. Demographic characteristics

A total of 222 respondents were included in this study. Out of 222 respondents (n=115, 51.8%) were male and (n=107, 48.2%) were female. Most of the 222 respondents were 20-56 years of age group (n=137, 61.7%). Majority of the respondents were non-smokers (n=187, 84.2%) and (n=35, 18.8%) were smokers. 33% respondent (n=74) were illiterate, 29.3% respondent (n=65) had primary education, 18.9% respondent (n=42) had intermediate level of education, 12.6% respondents (n=28) had graduate level of education and 5.9 %(n=13) had post-graduate level of education. 50.5% respondent (n=112) had fair health status,28% respondents (n=63) had poor health status and 21.2% respondent (n=47) had good health status. 62.6% respondent had low level of physical activity (n=139), 35.6% respondents had medium level of physical activity (n=79) and 1.8% respondent had high level of physical activity (n=4).

 Details of demographic characteristics are listed in table 1.

Table 1: Descriptive results for Socio-demographic Characteristics

Sr. No.	Variables	n	%
1	AGE		
	20-25 years	137	61.7
	26-70 years	72	32.4
	70 years above	13	5.9
2	GENDER		
	Male	115	51.8
	Female	107	48.2
3	SMOKING		
	Yes	35	15.8
	No	187	84.2
4	WORKING STATUS		
	Working	80	36
	Non- Working	142	64
5	EDUCATION		
	Illiterate	74	33.3
	Primary	65	29.3
	Intermediate	42	18.9
	Graduate	28	12.6
	Post Graduate	13	5.9
6	MARITAL STATUS		
	Married	200	90.1
	Unmarried	22	9.9

7	PHYSICAL ACTIVITY		
	Low	139	62.6
	Medium	79	35.6
	High	4	1.8
8	HEALTH STATUS		
	Good	47	21.2
	Fair	112	50.5
	Poor	63	24.8
9	PAYMENT PLAN AT HOSPITAL		
	Out of pocket	58	26.1
	Health card	164	73.9
10	DAILY EXERCISE		
	Less than 30 Minutes	199	89.6
	More than 30 Minutes	23	10.4
11	COMORBIDITIES		
	No	106	47.7
	Diabetes	80	36
	Hypertension	25	11.3
	Kidney Disease	3	1.4
	Lungs Disease	3	1.4
	Don't Know	5	2.3
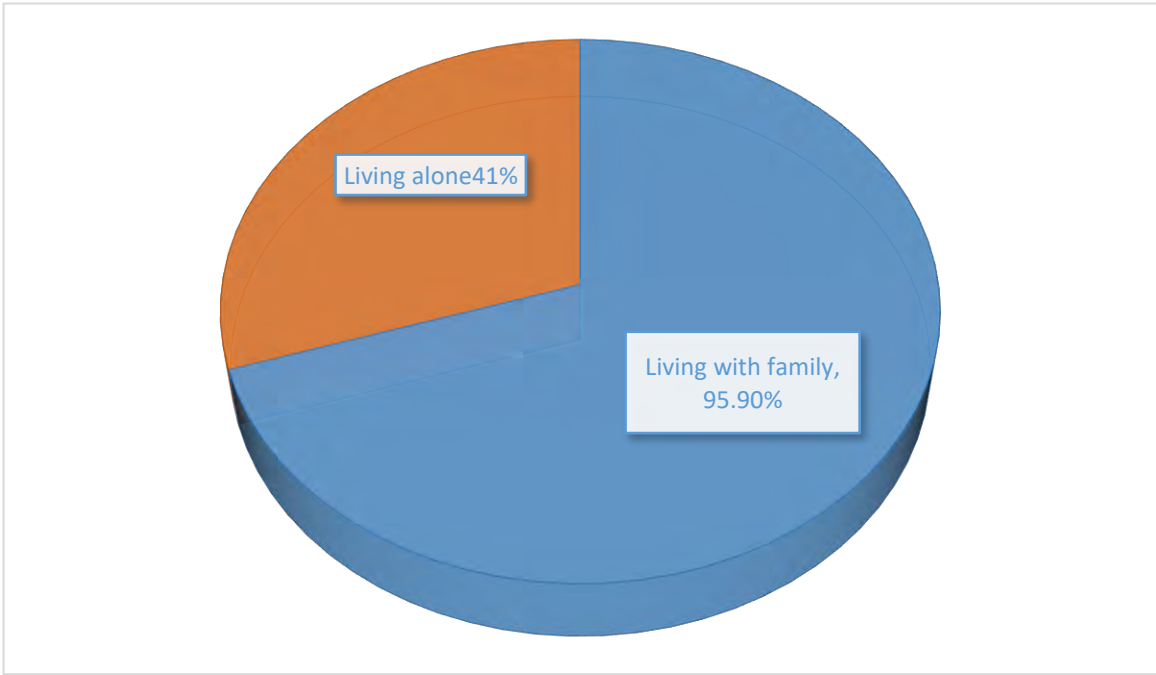
Figure 4: Residence of respondents
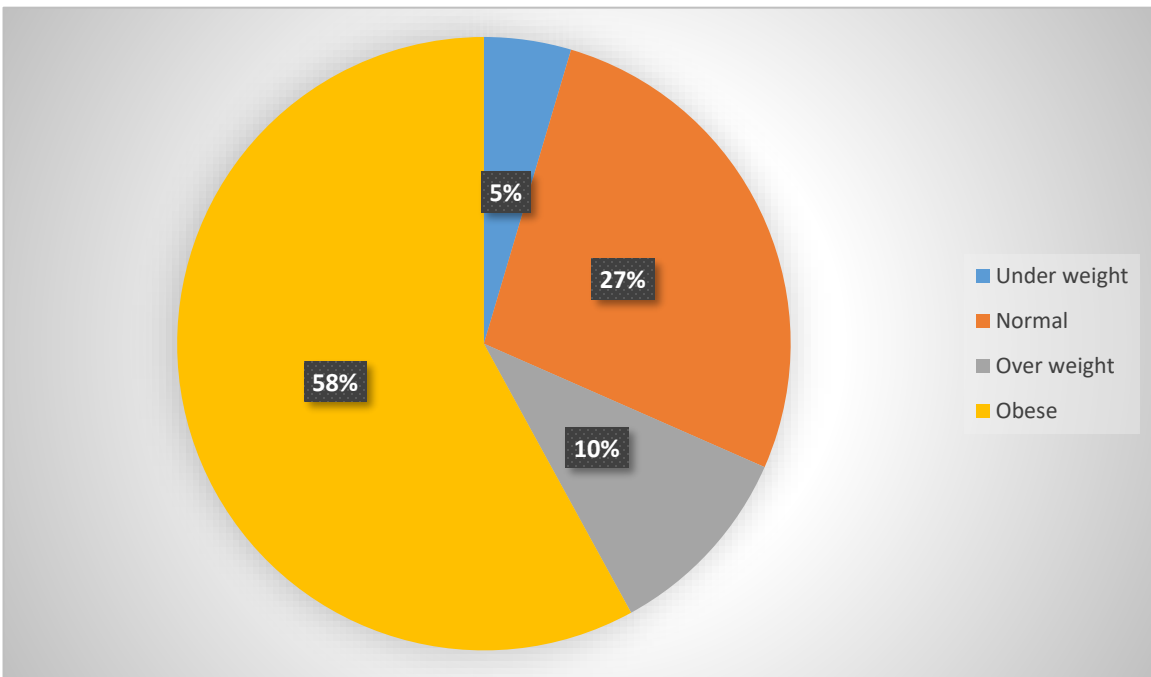
Figure 5: Categories of respondents according to BMI

4.2. Descriptive for outcome variable

4.2.1: Awareness to lifestyle changes in managing CVD's

Total 222 respondent completed the questionnaire on awareness to lifestyle risk factors and barriers to lifestyle changes in managing cardiovascular diseases. Questionnaire was interview based. Awareness to lifestyle risk factors was assessed using questionnaire adapted from previous studies. Out of total 222 respondents (53.6%, n =119) had poor awareness   and (46.4%, n=103) had good awareness to lifestyle changes in managing cardiovascular diseases as shown in figure below. Results of awareness are shown in table 2 and figure 6.
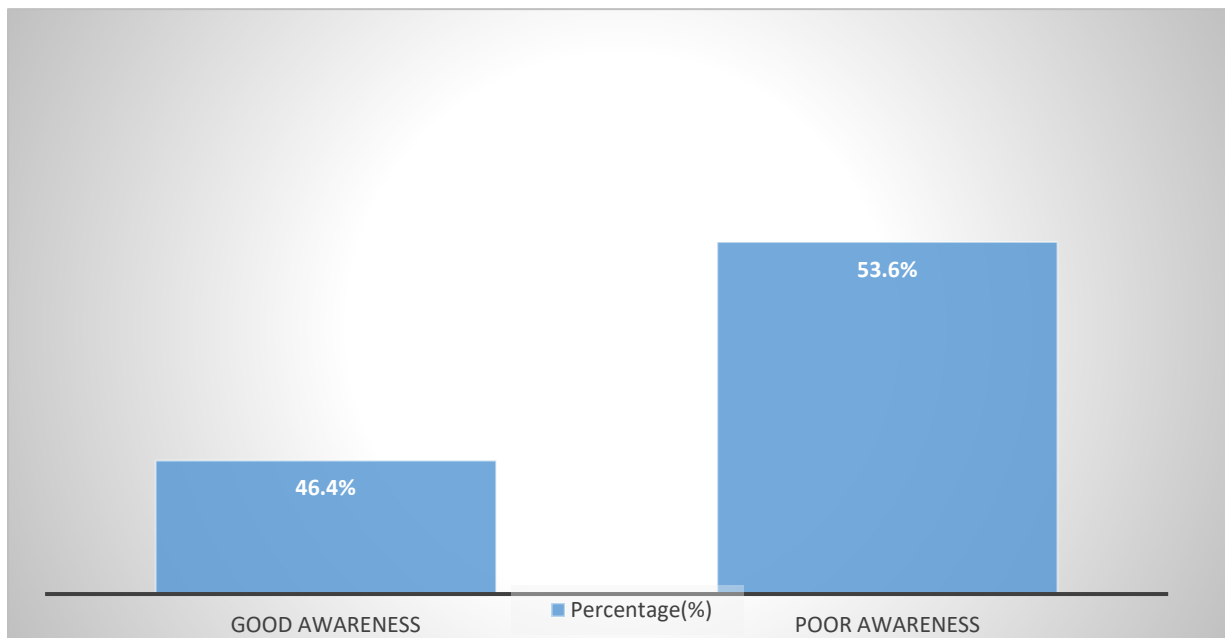
Figure 6: Awareness to lifestyle change

Table 2: Descriptive result of outcome variable (Awareness to lifestyle changes)

Sr. No.	Content		n	%
1	OBESITY	**Does Obesity Influence Coronary Heart Disease?**		
		Yes	89	40.1
		No	44	19.8
		Don't Know	89	40.1
2	LIPID LEVELS	**Does High Lipid Levels Influence Coronary Heart Disease?**		
		Yes	119	53.6
		No	44	19.8
		Don't Know	89	40.1
3	BLOOD GLUCOSE LEVELS	**Does High Glucose Levels / Diabetes Influence Heart Disease?**		
		Yes	105	47.3
		No	24	10.8
		Don't Know	93	41.9
4	PHYSICAL ACTIVITY	**Does exercise habit Influence Coronary Heart Disease?**		
		Yes	132	59.5
		No	22	9.9
		Don't Know	68	30.6
5	STRESS MANAGEMENT	**Does stress Influence Coronary Heart Disease?**		
		Yes	145	65.3
		No	20	9.0
		Don't Know	57	25.7
6	SMOKING	**Does smoking habit Influence Coronary Heart Disease?**		
		Yes	130	58.6
		No	13	5.9
		Don't Know	79	35.6
7	HERIDATERY	**Does Hereditary Characters Influence the coronary heart disease?**		
		Yes	59	26.6
		No	51	23
		Don't Know	112	30.6
8	DIETARY CHANGES	**Does diet Influence the coronary heart disease?**		
		Yes	130	58.6
		No	25	11.2
		Don't Know	67	30.2

9	**BLOOD PRESSURE**	**Does high blood pressure Influence Coronary Heart Disease?**		
		Yes	114	51.4
		No	16	7.2
		Don't Know	92	41.4
10	**SALT INTAKE**	**Does salt take Influence Coronary Heart Disease?**		
		Yes	101	45.5
		No	11	5.0
		Don't Know	110	49.5

4.2.2. Barriers to life style changes in managing CVD's

Results of barriers to lifestyle changes in managing cardiovascular diseases are shown in table 3.

Table 3: Descriptive results (barriers to lifestyle changes)

Sr. No.	Content		n	%
1	**HEALTHY LIFESTYLE**	**What prevents you from maintaining healthy lifestyle?**		
		Lack of motivation	155	69
		Lack of family support	79	35.6
		Lack of resources	91	41
2	**REGULAR EXERCISE**	**What prevents you from doing regular exercise?**		
		Sedentary lifestyle	130	58.6
		Lack of time	162	73
		Lack of facility	41	18.5
3	**HEALTHY DIET**	**What prevents you from having healthy diet?**		
		Lack of time to prepare food	77	34.7
		Lack of resources	111	50
		Healthy food is not easily available	104	46.8
		Lack of self-control	88	39.6
4	**LOW FAT DIET**	**What prevents you from eating low fat diet?**		
		It took longer to cook separate low fat food.	145	65
		I don't like low fat food	83	37.4
		Lack of resources	92	41.4
5	**LOW SALT DIET**	**What prevents you from eating low salt diet?**		
		I don't like low salt diet	133	59.9
		It is tasteless	148	66.7
		Lack of self-control	69	31.1

6	SMOKING CESSATION	What prevents you to stop smoking?		
		Lack of motivation	23	10
		Lack of family support	18	8.1
		Lack of self-control	30	13.5
7	LIFESTYLE BARRIERS	What do you think are lifestyle barriers in managing cardiovascular diseases?		
		Lack of awareness	115	51.8
		Lack of motivation	140	63.1
		Lack of resources	162	73
		Lack of family support	70	31.5
8	LIFESTYLE CHANGES	Which lifestyle change do you think is hardest to maintain?		
		Daily exercise	168	71.7
		Low fat diet	122	55
		Smoking cessation	49	22.1

4.2.2.1. Barriers to lifestyle changes

Results for barriers to lifestyle changes including increased daily exercise, low fat food and smoking cessation are shown in figure 7.
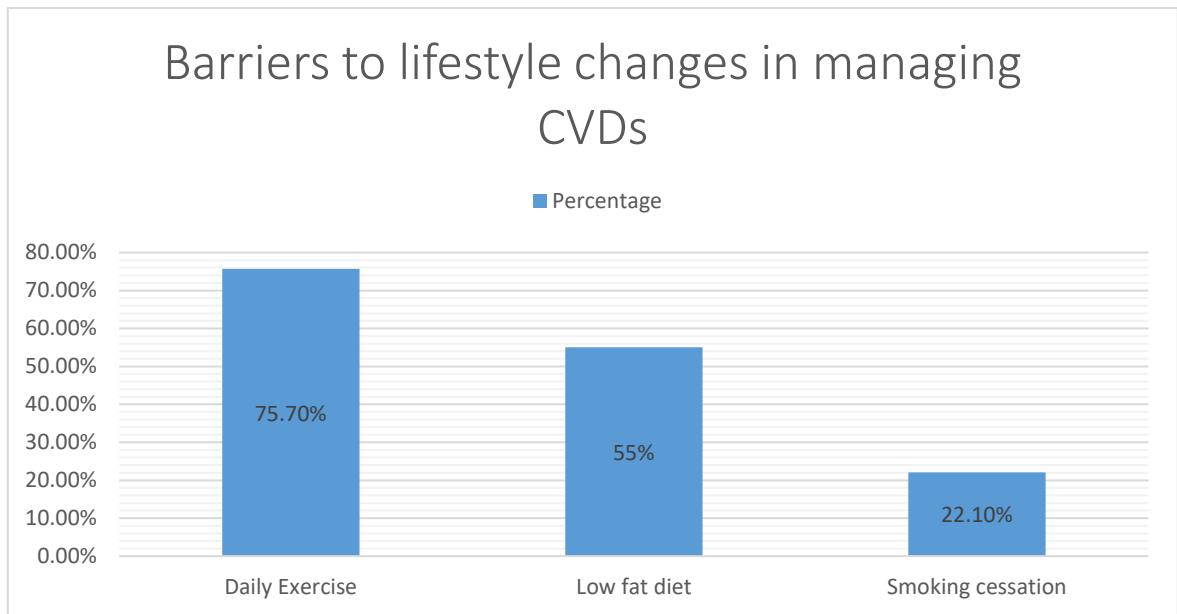
Figure 7: Barriers to lifestyle changes in managing CVD

4.2.2.2. Barriers to lifestyle change: Increased daily exercise

Lack of time was the most frequently reported barrier (73% n=162) to increased daily exercise followed by sedentary lifestyle (58.6% n=130) and lack of facility or expensive fitness centers (18.5% n=41).
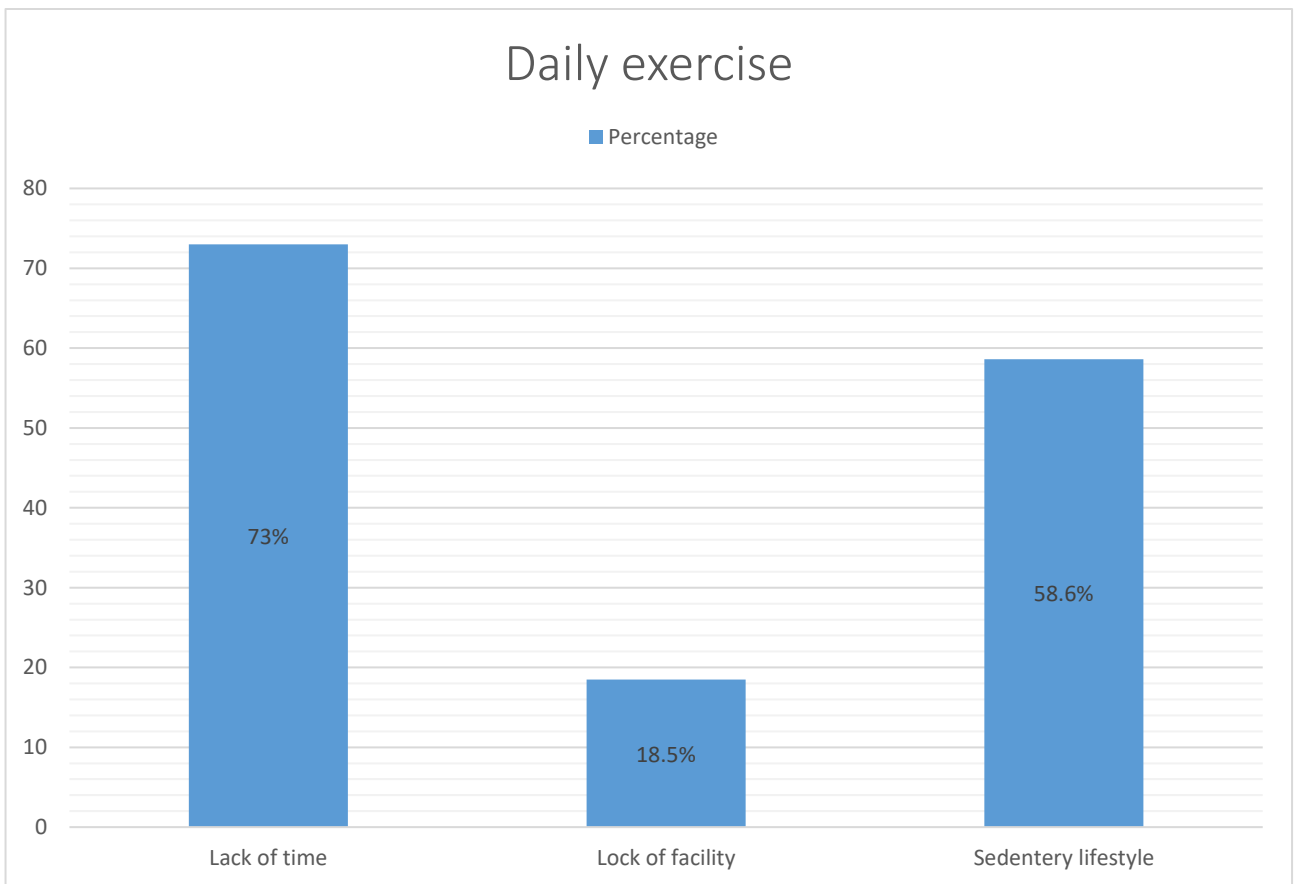
Figure 8: Increased daily exercise

4.2.2.3. Barriers to lifestyle changes: Low fat diet

Out of 222 respondents most of the respondent stated barriers relating to low fat food taking longer to prepare (65.3% n=145) followed by low fat food not easily available (46.8 % n =104), lack of resources (41.4% n =92), lack of self-control (39.2% n = 88), not liking low fat food (37.4% n =83) and lack of time to prepare food (34.7% n =77).
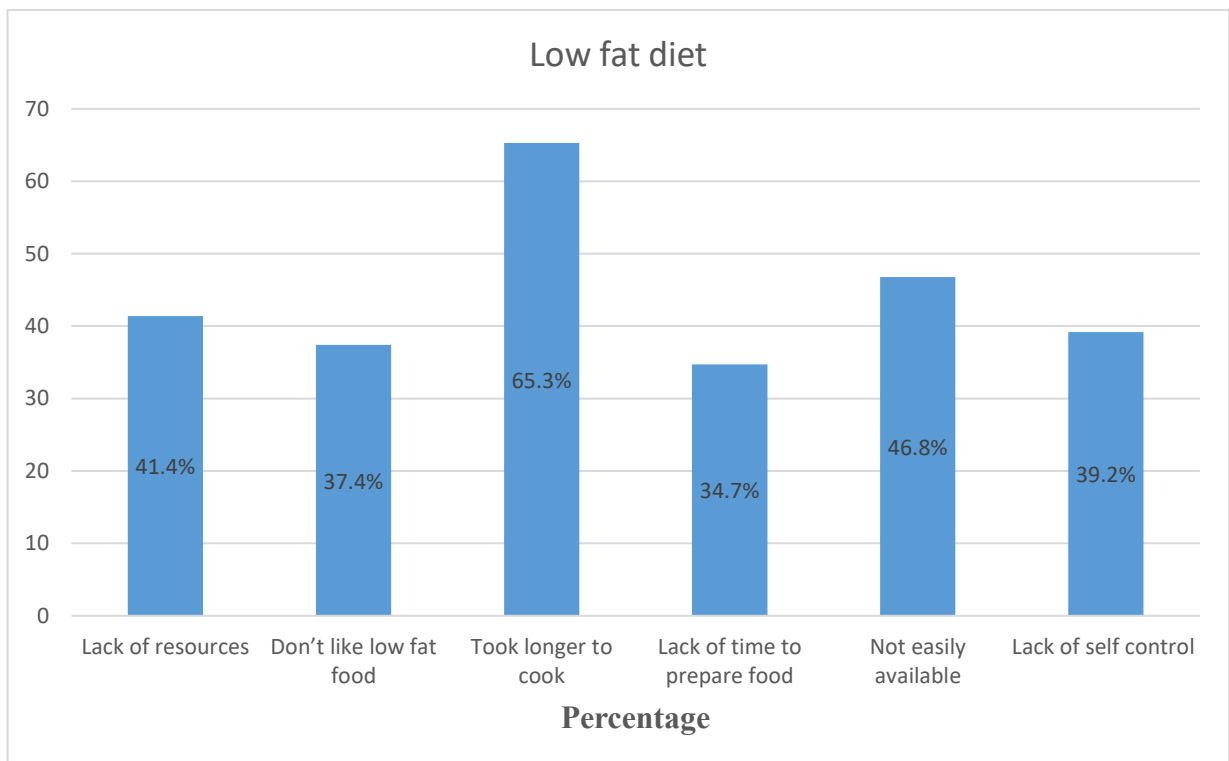
Figure 9: Low fat diet

4.2.2.4. Barriers to lifestyle change: Smoking cessation

Among smoker's lack of self-control (12.60% n =28) was most frequently reported barrier to smoking cessation followed by lack of motivation (9.90% n=22) and lack of family support (7.70% n =17).
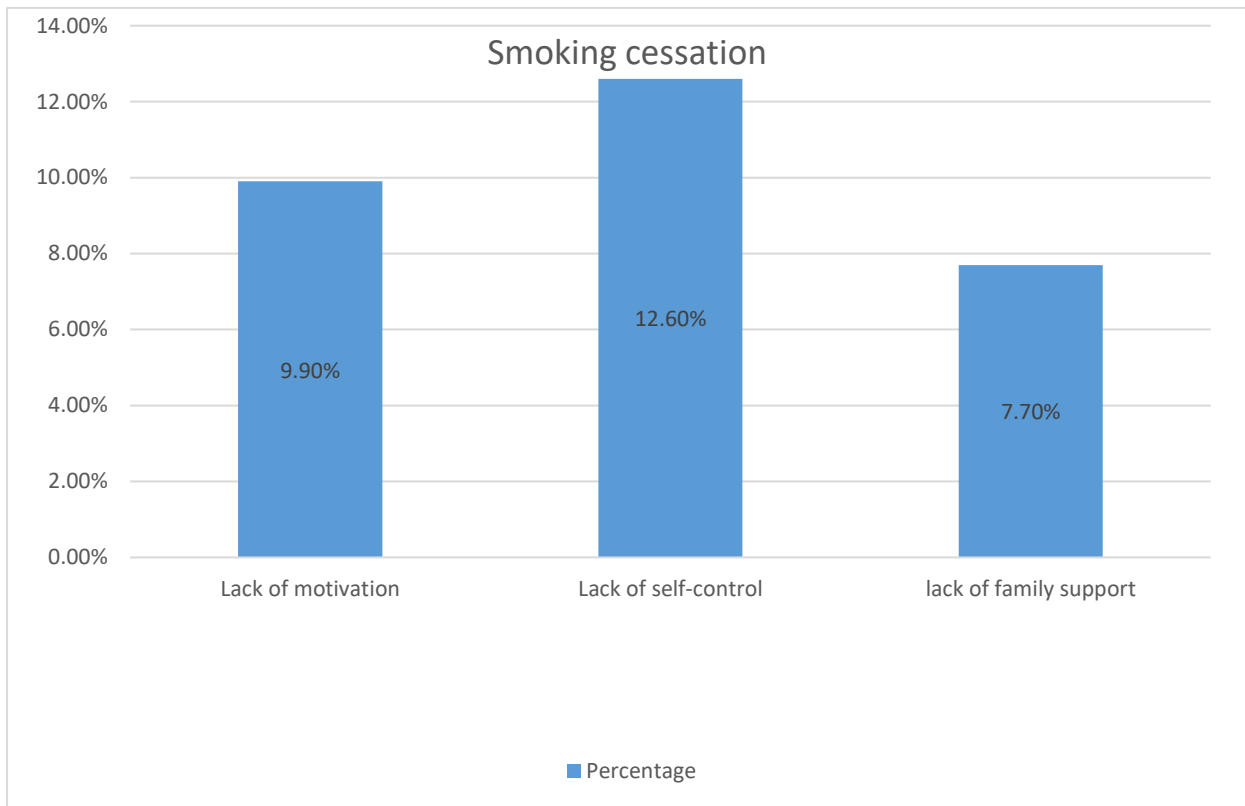
Figure 10: Smoking cessation

4.3. Inferential results

4.3.1. Awareness to life style changes in managing CVD's

Chi-square test of association was run for demographic variables with computed score for awareness to lifestyle changes in managing cardiovascular diseases. Result of Pearson's chi square showed significant association of gender $X^2 = 5.420(1)$ p = 0.020, education level $X^2 = 13.807(4)$ p = 0.008, working status $X^2 = 11.095(1)$ p = 0.001, monthly income $X^2 = 11.367(3)$ p = 0.010 and residence $X^2 = 7.531(1)$ p = 0.006 with computed score for awareness to lifestyle changes in managing cardiovascular diseases. (Table 4)

Table 4: Association of awareness to lifestyle changes with associated socio-demographic factors

Variables	Awareness % (n)		Chi-Square (df)	P-Value
	Good Awareness	**Poor Awareness**		
GENDER				
Male	53.9(62)	46.1(53)	5.420(1)	**0.020**
Female	38.3(41)	67.1(66)		
MONTHLY INCOME				
Less than 20,000	39.4(41)	60.6(63)		
20,000-40,000	39.3(22)	60.7(34)	11.357(3)	**0.010**
41,000-60,000	64.5(20)	35.5(11)		
More than 60,000	64.5(20)	35.5(11)		

MARITAL STATUS				
Married	47(94)	53(106)	0.296(1)	0.587
Unmarried	40.9(9)	59.1(13)		
WORKING STATUS				
Working	61.3(49)	38.3(31)	11.095(1)	**0.001**
Non-Working	38(54)	62(88)		
RESIDENCE				
With Family	44.6(95)	55.4(118)	7.531(1)	**0.006**
Alone	88.9(8)	11.1(1)		
AGE				
20-56 years	48.9(67)	51.1(70)		
57-70 years	45.8(33)	54.2(39)	3.198(2)	0.202
More than 70	23.1(3)	76.9(10)		
EDUCATION LEVEL				
Illiterate	39.2(29)	0.8(45)		
Primary	35.4(23)	64.6(42)		
Intermediate	54.8(23)	45.2(19)	13.807(4)	**0.008**
Graduate	67.9(19)	32.1(9)		
Post Graduate	69.2(9)	30.8(4)		
PAYMENT PLAN				
Out of Pocket	56.9(33)	43.1(25)	3.481(1)	0.062
Health Card	42.7(70)	57.3(94)		

PHYSICAL ACTIVITY				
Low	40.3(56)	59.7(83)		
Medium	57(45)	43(34)	5.661(2)	0.059
High	50(2)	50(2)		
COMORBIDITIES				
No	44.3(47)	5.7(59)		
Diabetes	43.8(35)	56.3(45)		
Hypertension	64(16)	36(9)	4.328(5)	0.503
Kidney Disease	33.3(1)	66.7(2)		
Lung Disease	66.7(2)	33.3(1)		
Don't Know	40(2)	60(3)		
DAILY EXERCISE				
Less than 30 minutes	44.7(89)	55.3(110)	2.161(1)	0.142
More than 30 Minutes	60.9(14)	39.1(9)		
ACCORDING TO BMI				
Underweight	5(11)	45(9)		
Normal	51.6(64)	48.4(60)	5.421(3)	0.143
Over Weight	35.4(71)	64.6(31)		
Obese	36.7(11)	63.3(19)		

4.3.2. Barriers to lifestyle changes in managing cardiovascular diseases

Chi square of association was run for demographic variables with most frequently reported barriers to lifestyle changes in managing cardiovascular diseases.

4.3.2.1. Barriers to lifestyle changes: Increased daily exercise

Chi square of association was run for demographic variable with lack of time to increased daily exercise as a barrier to lifestyle changes in managing cardiovascular diseases. Result of Pearson's chi square showed significant association of marital status $X^2 = 9.376(1)$ P= 0.002 and gender $X^2 =7.544(1)$ p= 0.006 with lack of time as a barrier to increased daily exercise. Results are shown in table 5.

Table 5: Association of associated socio-demographic factors with lack of time as a barrier to increased exercise.

Variables	Does Lack of time prevents you from doing regular exercise % (n)		Chi-square (df)	P-Value
	Yes	No		
MARITAL STATUS				
Married	76(152)	24(48)	9.376(1)	**0.002**
Unmarried	45.5(10)	54.5(12)		
WORKING STATUS				
Working	76.3(61)	23.8(19)	0.681(1)	0.409
Non-Working	71.1(101)	28.9(41)		

GENDER				
Male	80.9(93)	19.1(22)	7.5441(1)	**0.006**
Female	64.5(69)	35.5(38)		
RESIDENCE				
With Family	71.8(153)	28.2(60)	3.474(1)	0.062
Alone	100(9)	0.0(0)		
EDUCATIONAL ATTAINMENT				
Illiterate	68.9(51)	31.1(23)	3.963(4)	0.411
Primary	73.8(48)	26.2(17)		
Intermediate	81.0(34)	19.0(8)		
Graduate	64.3(18)	35.7(10)		
Post Graduate	84.6(11)	15.4(2)		
MONTHLY INCOME				
Less than 20,000	75(78)	25(26)	1.903(30)	0.593
20,000-40,000	66.1(37)	33.9(19)		
41,000-60,000	74.2(23)	25.8(8)		
More than 60,000	77.4(24)	22.6(7)		

4.2.2.2. Barriers to lifestyle changes: Low fat food

Chi square of association was run for demographic variable with longer time to prepare low fat food as a barrier to lifestyle changes in managing cardiovascular diseases. Result of Pearson's chi square showed significant association of residencezX^2 =4.235(1) p=0.040 and educational attainment X^2 =9.563(4) p = 0.048 with longer time to prepare low fat food as barrier to eating low fat food. Results are shown in table 6.

Table 6: Association of associated socio-demographic factors with longer time to prepare low fat food as a barrier to eat low fat food.

Variables	Does longer time to prepare low fat food prevents you from eating low fat food? % (n)		Chi-square (df)	P-value
	Yes	**No**		
RESIDENCE				
Family	66.7(142)	33.3(71)	4.235(1)	**0.040**
Alone	33.3(3)	66.7(6)		
WORKING STATUS				
Working	63.7(51)	36.3(29)	0.135(1)	0.713
Non-Working	66.2(92)	33.8(48)		
EDUCATIONAL ATTAINMENT				
Illiterate	73(54)	27(20)	9.563(4)	**0.048**
Primary	72.3(47)	27.7(18)		
Intermediate	57.1(24)	42.9(18)		
Graduate	50(14)	50(14)		
Post-Graduate	46.2(6)	53.8(7)		

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4.2.2.3. Barriers to lifestyle changes: Smoking cessation

Chi square of association was run for demographic variable with lack of self -control as a barrier to smoking cessation. Result of Pearson's chi square showed significant association of age $X^2 = 6.176$ p = 0.0046 with lack of self -control as barrier to smoking cessation.

Table 7: Association of associated socio-demographic factors with lack of self- control as a barrier to smoking cessation.

Variables	Does lack of self-control prevent you from smoking cessation % (n)		Chi-Square (df)	P-Value
	Yes	**No**		
HEALTH STATUS OF RESPONDENTS				
Good	17(8)	83(39)		
Fair	16.1(18)	83.9(94)	3.889(2)	0.143
Poor	6.3(4)	93.7(59)		
MARITAL STATUS				
Married	14.5(29)	85.5(171)	1.680(1)	0.195
Unmarried	4.5(1)	95.5(21)		
AGE (YEARS)				
20-56	16.8(23)	83.2(114)	6.176(2)	**0.046**
57-70	5.6(4)	94.4(68)		
More than 70	23.1(3)	76.9(10)		

EDUCATIONAL ATTAINMENT				
Illiterate	2.7(2)	97.3(72)	11.820(4)	**0.019**
Primary	9.2(6)	90.8(59)		
Intermediate	14.3(6)	85.7(36)		
Graduate	21.4(6)	78.6(22)		
Post Graduate	23.1(3)	76.9(10)		
MONTHLY INCOME (RUPEES)				
Less than 20,000	4.8(5)	95.2(99)	25.237(3)	**0.000**
20,000-40,000	3.6(2)	96.4(54)		
41,000-60,000	12.9(4)	87.1(27)		
More than 60,000	38.7(12)	61.3(19)		

CHAPTER V: DISCUSSION

In the present study assessment of awareness and barriers to lifestyle changes in managing cardiovascular diseases was done among patients visiting public and private cardiac OPDs of Rawalpindi. Awareness and barriers to lifestyle changes in managing cardiovascular diseases was done using tool adapted from previous studies. Pilot testing was performed before starting the formal data collection procedure by including 10% of the actual sample size (222).

Results of awareness to lifestyle changes showed that 46.4% respondent (n=103) had good awareness and 53.6% respondents (n=119) had poor awareness to lifestyle changes in managing cardiovascular diseases. These current results showed that there is a slight difference between these two levels.

The study showed significant association between "awareness and gender (p=0.020), education level (p=0.008), working status (p=0.001), monthly income (p= 0.010) and residence of respondents (p= 0.006). There was no significant association found between awareness and age, marital status, BMI, comorbidities (p>0.05). Majority of the male respondents (53.9%, n=62) had good awareness to lifestyle changes in managing cardiovascular diseases as compared to female respondents (38.3%, n=41). Moreover, it was found that level of monthly income of individual was directly proportional to pattern of awareness as most of the people (64.5%) with high income level tend to show good awareness as compared people (39.4%) with low monthly income level. Association of awareness with working status of respondent was also checked which showed that most of the working people (61.3%) had good awareness as compared non-working people (38%). People living with family had poor level of awareness as compared to people living alone. Results of this study showed that education level of respondent was directly proportional to awareness of respondent to lifestyle changes in managing cardiovascular diseases. People with

high education level had good awareness level as compared to people with low education level. Illiterate people (60.8%) had poor awareness to lifestyle changes.

In this study education level of respondent showed significant association with awareness to lifestyle risk factors and changes and it was found that people with high education level had good awareness as compare to people with low level of education. Study conducted in Buea, Cameroon has also found significant association of education level with awareness to lifestyle risk factors. Participants with high levels of education were over twice as likely to have good awareness (Aminde et al., 2017). Another study conducted among vulnerable communities of Belgium and England found significant association of education level with knowledge and awareness to lifestyle risk factor in managing cardiovascular disease indicating that high level of education had better score for knowledge and awareness (Hassen et al., 2022). Study conducted in Tehran, Iran also found significant association between awareness and knowledge to lifestyle risk factors to CVDs with level of education. Respondents with high level of education had good awareness (Fatemeh Koohi, September 13, 2020).

Results of this study showed significant association of gender with awareness to lifestyle changes in managing cardiovascular diseases. Most of the male respondent had good awareness as compared to female respondent. A study conducted in Kuwait also found significant association of gender with awareness but unlike current study this study found that awareness to lifestyle risk factors was significantly higher among females compared to males (Al-Nafisi & Awad, 2014). Another study conducted in Buea Cameroon found that knowledge/awareness score was better in women compared to men (Aminde et al., 2017). A study conducted at Ayub Teaching Hospital Abbottabad, Pakistan revealed that Male gender and educational status were associated with good level awareness (Aziz et al., 2014). Possible explanation to good awareness in male

compared to female in current study may be a lower percentage of women included in this study than men and most of the women were from rural areas and were illiterate or had low level of education compared to men.

It was found in current study that monthly income level of respondent was significantly associated with awareness to lifestyle changes in managing cardiovascular diseases. People with high income level had good awareness compared to people with low monthly income level. Study conducted in Buea Cameroon also found that high level of monthly income was associated with overall good knowledge and awareness to lifestyle risk factors (Aminde et al., 2017). Similarly, a study conducted in Mukono and Buikwe districts in Uganda revealed that household income was significantly associated with knowledge and awareness as people with high monthly income level had good awareness compared to people with low income level (Ndejjo et al., 2020). Unlike current study another study conducted in Kuwait revealed that respondent's monthly income was not significantly associated with awareness (Al-Nafisi & Awad, 2014). Possible explanation to good awareness among people with high income level could be that most of the people with high income had high level of education so they had good awareness.

Findings of current study revealed significant association of working status with awareness to lifestyle changes in managing cardiovascular diseases. It was found that working people had good awareness compared to non-working people. Study conducted in Tanzania also found a significant association (p=0.05) of working status with awareness (Muhihi et al., 2020). Another study conducted in Nepal found that working people and people with high education level had good awareness (Vaidya et al., 2013). The possible explanation to good awareness among working respondents may be that most of the working respondents were educated and they had had positive social network.

Current study also showed significant association of residence with awareness to lifestyle changes in managing cardiovascular diseases. Majority of the respondent who were living alone (88.9%) had good awareness level compared to respondent who were living with families (44.6%). Possible explanation to good awareness among respondent living alone compared to the respondent living with families may be that most of the respondent living alone had high level of education and high income level as most of them were living away from home because of job or education.

Present study found that most of the respondent aged more than 70 years had poor awareness to lifestyle changes in managing cardiovascular diseases compared to respondents aged less than 70 years but there was no significant association. Respondents of aged (20-56 years) and (57-70 years) had good awareness to lifestyle changes compared to respondents of aged (>70 years) .A study conducted in Kuwait found significant association of age with awareness and revealed that respondents aged 50-59 years had good awareness as compared to other age groups (Al-Nafisi & Awad, 2014). Study conducted in Riyadh showed that highest overall awareness to lifestyle risk factors of CVD is seen among participant aged 35-44 years (Mujamammi1, 2020). Present study revealed that respondent aged less than 70 years has good awareness as compared to respondents aged more than 70 years. This may be explained by the fact that respondent aged less than 70years were more educated and had more social interaction. It may be due to reason that in our population older people have rigid believes that they don't accept new information easily.

Results of barriers to lifestyle changes in managing cardiovascular diseases showed that 75.7% (n=168) respondent reported daily exercise, 55% (n=122) respondents reported eating low fat diet and 22.1% (n=49) respondents reported smoking cessation as a major barrier to lifestyle changes in managing cardiovascular diseases.

Barrier most frequently reported to increased daily exercise was lack of time to do increased daily exercise (73%), barrier most frequently reported to eat low fat food was it took too longer to prepare low fat food (65.3%) and barrier most frequently reported to smoking cessation was lack of motivation to stop smoking (12.60%). Other barriers reported were sedentary lifestyle, lack of facility to do daily exercise, lack of resources, lack of time to prepare low fat food, low fat food being not easily available, lack of self-control, lack of motivation and lack of family support.

Among most commonly reported barriers were those relating to time, resources, and availability of healthy food. Approximately similar barriers (cost and time) were reported in study conducted among 40-60 years old Danes (Nielsen et al., 2017). Beside structural barriers some personal barriers were also reported most commonly of them were sedentary life style, not liking low fat food, lack of self-control, lack of motivation. These results were in accordance with the literature reporting that attitude towards and experience with physical activity/exercise, unwillingness to change diet, and family support are important determinants for maintaining initiated lifestyle changes (Borg et al., 2019; Murray et al., 2012).

Lack of time to increased daily exercise was significantly associated with marital status (p=0.002) and gender (p=0.006) and was not significantly associated with working status and residence (p>0.05). Current study found that most of the married respondents (76%, n=152) reported lack of time as a barrier to increased daily exercise compared to unmarried respondents (45.5%, n=10). The possible explanation to this may be their hectic routine, increased financial and household responsibilities and increased family pressure.

Current study revealed that most of the men (80.9%, n=93) reported lack of time as a barrier to increased daily exercise compared to women (64.5%, n=69).

Present study revealed that most of the working respondents (76.3% n=61) reported lack of time as a barrier to increased daily exercise compared to non-working respondents (71.1%, n=101). Possible explanation to this may be the hectic routine and increased work and family responsibilities as males are responsible for all social and financial support for their families, they are head of families in our culture so that they do not get enough time for exercise.

Results of current study revealed that most of respondents with high education level (84.6%) and high monthly (77.4%) income level reported lack of time as barrier to increased exercise. These findings are consistent with the pervious study conducted among 40-60 years old Danes (Nielsen et al., 2017). Possible explanation to this may be that they have hectic routine due to their educational and job activities and responsibilities.

Current study found the significant association of longer time require to prepare low fat food as a barrier to eat low fat food with residence (p= 0.040) and educational attainment (p =0.048) and non-significant association with working status (p>0.05). It was found that most of the respondents with low level of education reported longer time to prepare low fat food compared to people with high level of education. Possible justification to this may be that low level of education have low awareness and they don't have enough resources to prepare low fat food so they considered it as a major barrier.

Results of this study found a significant association of lack of motivation to stop smoking as a barrier to smoking cessation with age (p=0.046), education (p=0.019), monthly income (p=0.000) and non-significant association with marital status, health status of respondent (p >0.05).

Current study revealed that most of the respondent aged 20-56 reported lack of motivation as barrier to smoking cessation compared to other age groups. The possible explanation to this maybe they do not have enough awareness on hazardous effects of smoking and they do not consider it as a major risk factor to CVDs. Moreover, they do not get enough support from family and friends to get motivated.

Current study found that most of the respondents with high level of education and monthly income reported lack of motivation as barriers to smoking cessation as compared to respondents with lower income and education level.

5.2: Strengths

The strengths of this study include the wide range of socio-economic, educational sample and the use of standardized survey methods. Moreover, the current study is somehow successful in assessing the awareness and barriers to lifestyle changes in managing cardiovascular diseases among cardiac patients visiting cardiac OPDs as representative sample size was calculate for this study. Current study is unique in this regard that major barriers to lifestyle changes in managing cardiovascular diseases were assessed among patients visiting cardiac OPDs of Rawalpindi as little similar studies were conducted in Pakistan on this aspect. The findings of the current study can be generalized to the cardiac patient population from other parts of Pakistan due to similar contextual factors. Promotion of healthy lifestyles, however, can lead to a higher quality of life and better management of cardiovascular diseases. We anticipate that the results of this research might impact health.

5.3. Limitations:

Despite our sincere efforts few limitations needed to be mentioned. As the current study was cross-sectional study, which limits the establishment of causality. Patient who did not understand Urdu/Punjabi were excluded from the study which can be a source of selection bias in the current study. Patients who were recently diagnosed were excluded from the study so awareness and barriers faced by those patients were not assessed in the current study.

5.4: Conclusion:

This study demonstrated that most of the respondents had poor awareness to lifestyle in managing cardiovascular diseases and barriers most commonly reported in the current study were lack of time to do regular exercise, longer time to cook low fat food and lack of motivation to stop smoking. It was concluded that respondents with low income and education level, non-working respondents had poor awareness. A considerable heterogeneity between different social group regarding barriers to lifestyle changes in managing cardiovascular diseases was observed.

It is necessary that physicians and other health care professionals should play major role in identifying positive lifestyle measures as important strategies for managing cardiovascular diseases alongside pharmacotherapy.

5.5. Recommendations:

Based on current findings following recommendations are put forward for policy maker to address this public health issue:

- Lifestyle changes plays a major role in managing and preventing CVD's therefore proper guidelines need to be developed to provide awareness to lifestyle changes in managing and preventing cardiovascular diseases among general public and cardiac patients and to provide health services that respond to the CVD needs of people.

- Government should encourage policies at local, national and international levels to support prevention, management and control of cardiovascular diseases.

- Policies should be developed and implemented that focuses on influencing and supporting individuals within their homes and communities to follow healthful lifestyles throughout their lives.

- Strategic use of mass media can be employed in CVD prevention and management efforts and thus contribute to robust and balanced public discourse.

- Because the determinants of cardiovascular diseases extend beyond the health sector, coordinated approaches are needed so that policies in non-health sectors of government such as education, urban planning, agriculture, can be developed and implemented synergistically with health policies to reduce risk for CVD.

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ANNEXURE: A

QUESTIONNAIRE

Awareness and barriers to lifestyle changes in managing cardiovascular diseases among patients visiting cardiac hospitals, Rawalpindi.

(Please answer the following questions after reading it carefully)

Socio-demographic characteristics:

<u>Section A</u>

1: What is your age? Years _____

2: What is your gender?

    1. Male
    2. Female

3: What is your marital status?

    1. Married
    2. Unmarried
    3. Other_____

4: What is your health status?

    1. Good
    2. Fair
    3. Poor

5: According to BMI?

    1. Under weight
    2. Normal
    3. Over Weight
    4. Obese

6: Physical activity?

    1. Low
    2. Medium
    3. High

7: Daily exercise?

    1. Less than 30min
    2. More than 30min

8: Educational attainment?

1. Illiterate
2. Primary
3. Intermediate
4. Graduate
5. Post graduate
6. Other (please specify)

9: Working status?

1. Working
2. Not working
3. Other

10: Do you smoke?

0. No
1. Yes

11: How many cigarettes do you smoke in a day?

0. Don't smoke

1. < 1pack/day

2. 1 pack/day

3. >1 pack/day

12: What is your monthly income?

0. < 20,000
1. 20,000 - 40,000
2. 41,000 – 60,000
3. >60,000

13: Living with?

1. Family
2. Alone
3. Other _____

14: Comorbidities?

0. No
1. Diabetes
2. Kidney disease
3. Lung disease

4. Don't know
5. Other _____

15: Onset of disease (years)

_____

16: Payment Plan

1. Out of pocket
2. Insurance
3. Panel
4. Other _____

Section B

Awareness to life style changes in managing cardiovascular diseases.

Give your opinion to the following questions.

1: Does obesity influences the coronary heart disease?

0. No
1. Don't know
2. Yes

2: Does high lipid levels influence the coronary heart disease?

0. No
1. Don't know
2. Yes

3: Does high blood glucose levels/diabetes influence the coronary heart disease?

0. No
1. Don't know
2. Yes

4: Does exercise habits influence the coronary heart disease?

0. No
1. Don't know
2. Yes

5: Does stress influences the coronary heart disease?

0. No
1. Don't know
2. Yes

6: Does smoking habits influence the coronary heart disease?

    0. No
    1. Don't know
    2. Yes

7: Does diet influences the coronary heart disease?

    0. No
    1. Don't know
    2. Yes

8: Does hereditary influences the Coronary heart disease?

    0. No
    1. Don't know
    2. Yes

9: Does high blood pressure influences the coronary heart disease?

    0. No
    1. Don't know
    2. Yes

10: Does junk food influence the cardiovascular disease?

    0. No
    1. Don't know
    2. Yes

11: Does high salt intake influence cardiovascular disease?

    0. No
    1. Don't know
    2. Yes

Section C

Barriers to lifestyle changes in managing cardiovascular diseases.

Tick all that apply

1: What prevent you from maintaining healthy life style in managing cardiovascular diseases?

    ☐ Lack of motivation
    ☐ Lack of family support
    ☐ Lack of resources
    ☐ Other _____

2: What prevents you from doing regular exercise?

    ☐ I am not used to doing physical exercise
    ☐ Lack of time
    ☐ It is expensive to go to fitness center
    ☐ Lack of facility

☐ Other _____

3: What prevents you from having healthy diet?

☐ Lack of time to prepare food
☐ Lack of resources
☐ Healthy food is not easily available
☐ Lack of self-control
☐ Other _____

4: What prevents you from eating low fat diet?

☐ It takes longer to cook low fat food compared to the usual cooking
☐ I don't like low fat food
☐ Lack of resources
☐ Other _____

5: What prevents you from eating low salt diet?

☐ I don't like low salt food
☐ It is tasteless
☐ Lack of self-control
☐ Other _____

6: What prevents you to stop smoking?

☐ Don't smoke
☐ Lack of motivation
☐ Lack of family support
☐ Lack of self-control
☐ Other _____

7: What do you think are lifestyle barriers in managing cardiovascular diseases?

☐ Lack of awareness
☐ Lack of motivation
☐ Lack of resources
☐ Lack of family support
☐ Other _____

8: Which (lifestyle change) do you think is hardest to maintain?

☐ Daily exercise
☐ Low fat diet
☐ Smoking cessation
☐ Other _____

ANNEXURE: B

Informed Consent form

I, RIDA FAROOQ, student of MSPH- Final Semester, Al-Shifa School of Public Health, Al-Shifa Eye Hospital, Rawalpindi. I am doing research on Awareness and barriers to lifestyle changes in managing cardiovascular diseases among patients visiting cardiac hospitals, Rawalpindi.

PURPOSE OF THE RESEARCH

The purpose of this study is to assess awareness and barriers to lifestyle changes in managing cardiovascular diseases among patients visiting cardiac hospitals, Rawalpindi.

PARTICIPATION

I do not anticipate that taking this study will contain any risk or inconvenience to you. Your participation is strictly voluntary and you may withdraw your participation at any time without penalty. I request you to answer the questions as honestly as possible. It will take no longer than 20 minutes to complete a questionnaire. All information collected will be used only for my research and will be kept highly confidential. Your identity and your responses will not be identifiable; all data will be stored anonymously. As this is solely a student project no incentive will be provided. Once study is completed, I would be happy to share the results with you if you desire.

Thank you for agreeing to participate in this study. Your feedback is important.

I have read and understand the information sheet and agree to take part in the study.

Signature: _____

Date: _____

ANNEXURE: C

IRB Letter

AL-SHIFA SCHOOL OF PUBLIC HEALTH
PAKISTAN INSTITUTE OF OPHTHALMOLOGY
AL-SHIFA TRUST, RAWALPINDI

No. MSPH-IRB/12-21
Date: 01st Oct, 2021

TO WHOM IT MAY CONCERN

This is to certify that **Rida Farooq** D/O **Muhammad Farooq Khan** is a student of Master of Science in Public Health (MSPH) final semester at Al-Shifa School of Public Health, PIO, Al-Shifa Trust Rawalpindi. She has to conduct a research project as part of curriculum & compulsory requirement for the award of degree by the Quaid-I-Azam University, Islamabad. Her research topic which has already been approved by the Institutional Review Board (IRB) is **"Awareness and Barriers to lifestyle changes in managing cardiovascular diseases among patients visiting Cardiac OPDs, Rawalpindi"**.

Please provide her necessary help and support in completion of the research project. Thank you.

Sincerely,

Dr. Ayesha Babar Kawish
Head of Department, MSPH
School of Public Health, PIO
Al-Shifa Trust, Rawalpindi

AL-SHIFA TRUST, JEHLUM ROAD, RAWALPINDI – PAKISTAN
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ANNEXURE: D

Gantt chart

Activities	September 2021	October 2021	November 2021	December 2021	January 2022	February 2022	March 2022
Literature search	███	███	███	███	███	███	
Synopsis writing and IRB approval	███						
Pilot testing		███					
Data collection and entry			███	███			
Data analysis					███		
Writeup					███	███	
Thesis submission							███

ANNEXURE: E

Budget

Budget item	Transport	Stationery and internet	Printing	Publishing
Pilot testing	500 Rs/-	5000 Rs/-	5000 Rs/-	-
Data collection	10,000 Rs/-	7,000 Rs/-	-	-
Thesis write-up	1,000 Rs/-	5,000 Rs/-	8,000 Rs/-	25,000 Rs/-
Total expenditure	16,000 Rs/-	17,000 Rs/-	13,000 Rs/-	25.000 Rs/-
Grand total	71,000 Rs/-			